ISSN NO: 3028-2586 Vol. 1 No. 6 October - December 2025

ERF INTERDISCIPLINARY RESEARCH AND DEVELOPMENT

ISSN NO. 3028-2586
October - December 2025

ERF INTERDISCIPLINARY RESEARCH AND DEVELOPMENT

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This journal follows a strict blind peer-review process, where both the identities of the authors and reviewers are concealed throughout the review process. The journal is dedicated to promoting unbiased evaluation of research contributions.

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UTILIZING COMIC-DESIGNED LESSONS (CDL) TO ENHANCED READING COMPREHENSION OF GRADE 3 LEARNERS IN FILIPINO

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Abstract

This study investigated the effectiveness of Comic-Designed Lessons (CDL) in enhancing the reading comprehension of Grade 3 learners in Filipino at Tampac Integrated School, Aguilar, Pangasinan. The study was conducted in response to recurring reading difficulties among primary pupils and aimed to: (1) determine learners' reading comprehension levels before CDL implementation, (2) assess their levels after the intervention, and (3) establish whether the improvement was statistically significant. A one-group pretest–posttest quasi-experimental design was employed. Twenty-three (23) Grade 3 learners were purposively selected to participate. Reading comprehension was measured using Phil-IRI-based passages and questions assessing literal, inferential, and critical understanding.

Results from the pretest showed that only 26.09% of pupils performed at the Independent level, 43.48% at the Instructional level, and 30.43% at the Frustration level, indicating that most learners required additional reading support. After 20 days of CDL integration in Filipino classes, posttest results revealed substantial gains: 78.26% of learners reached the Independent level, 21.74% remained at the Instructional level, and no learners were classified at the Frustration level. The mean score increased from 3.00 (SD = 0.85) to 4.09 (SD = 0.72). A paired t-test produced $t = -8.74$ and $p = 1.32 \times 10^{-8}$, confirming that the improvement was statistically significant and leading to the rejection of the null hypothesis.

The study concludes that CDL is an effective and engaging tool for improving Filipino reading comprehension. It recommends sustained CDL use, teacher capability building, and continuous monitoring to support learners who still need guidance.

Keywords: Comic-Designed Lessons, Reading Comprehension, Grade 3 Learners, Filipino, Phil-IRI, Action Research, Pretest–Posttest

1. Introduction

Reading comprehension is a foundational literacy skill that enables learners to construct meaning from text, connect ideas, and use information for further learning. In the primary grades, comprehension is especially critical because students transition from "learning to read" to "reading to learn." The Department of Education (DepEd) has long emphasized early-grade reading mastery through national policies such as the Reading Literacy Program and the "Every Child a Reader" thrust, which expects Grade 3 learners to demonstrate basic literacy before promotion (Department of Education [DepEd], 2002). This commitment continues through the Every Child a Reader Program (ECARP), which funds and guides school-based reading interventions and assessments (DepEd, 2012). More recently, DepEd has reiterated the urgency of improving literacy outcomes in light of national survey results and academic recovery efforts, particularly for Key Stages 1–3 (DepEd, 2025a; DepEd, 2025b). These policies underscore that addressing reading gaps at Grade 3 is not optional—it is central to equitable schooling.

Despite these initiatives, many Filipino children still struggle with comprehension, including in Filipino as a mother tongue and as a subject. One reason is that comprehension difficulties often stem from weak decoding, limited vocabulary, and low engagement with print, which can make reading feel effortful and discouraging. DepEd therefore mandates the use of the Philippine

Informal Reading Inventory (Phil-IRI) as a classroom-based diagnostic tool to determine learners' independent, instructional, and frustration levels in comprehension (DepEd, 2018; Department of Education, Bureau of Learning Delivery, 2018). Phil-IRI results allow teachers to identify pupils who can read with minimal support, those who need guided instruction, and those who require intensive remediation. In many schools, Phil-IRI data consistently show clusters of learners falling at instructional and frustration levels, highlighting the need for innovations that are both pedagogically sound and child-friendly.

One promising approach is the integration of comics or lessons designed with comics. Comics are multimodal texts that combine sequential images with concise written language, enabling learners to process meaning through both visual and verbal channels. Studies in Philippine classrooms have shown that comics can significantly improve reading comprehension compared with traditional text-only materials. For example, a school-based intervention in Ifugao found notable gains in elementary pupils' comprehension when comics were used as reading materials, with learners reporting greater enjoyment and clearer understanding due to the alignment of pictures and text (Bugtong et al., 2025). Similarly, Castro (2023) reported that Grade 4 pupils who underwent comics-strip remediation improved more than those who used short stories, attributing gains to visual scaffolds that supported meaning-making. International and local evidence converges on the idea that comics help reduce reading anxiety and foster active engagement, especially for struggling readers (Verrier, 2020; WJARR, 2023).

Established learning theories can explain the effectiveness of comics. Dual Coding Theory posits that information is better learned and retained when processed through both verbal and nonverbal systems; the two pathways reinforce each other and deepen understanding (Sadoski & Paivio, 1994; see also Graphic Learners, 2024). Comics naturally enact this principle: images supply contextual clues while text provides linguistic structure, allowing young learners to infer meaning even when vocabulary is limited. In addition, multimodal texts can lower cognitive load by breaking dense narratives into manageable panels, reducing the burden on working memory, and enabling learners to focus on constructing meaning from smaller chunks of information (Bugtong et al., 2025). Through these mechanisms, comics are not mere "motivational extras"; they are structured literacy supports that can accelerate comprehension growth.

This study responds directly to the persistent comprehension gaps observed among Grade 3 pupils at Tampac Integrated School, Aguilar, Pangasinan. Classroom observations and Phil-IRI results indicated that several learners struggled to answer literal, inferential, and critical comprehension questions in Filipino texts. These difficulties often manifested as reduced participation, slow reading pace, and limited recall of details. Given DepEd's mandate to diagnose and remediate early-grade reading difficulties using context-appropriate interventions (DepEd, 2018), the researcher designed Comic-Designed Lessons aligned with Filipino curriculum competencies and learners' developmental levels. CDL materials used familiar contexts, age-appropriate vocabulary, and sequential visuals to support understanding of story structure and question answering.

Anchored in action research and employing a one-group pretest–posttest quasi-experimental design, the study aimed to determine whether CDL could significantly improve reading comprehension levels of Grade 3 learners in Filipino. Specifically, it sought to: (1) identify learners' comprehension levels before CDL implementation; (2) determine comprehension levels after the intervention; and (3) test whether any observed improvement was statistically significant. By situating comics within Filipino reading instruction—rather than treating them as separate enrichment texts—this study contributes to the growing body of evidence that multimodal, culturally resonant materials can strengthen foundational literacy. Ultimately, the findings are expected to inform classroom practice, support ECARP goals, and provide a replicable model for teachers seeking engaging, theory-grounded interventions for young readers.

2. Method

2.1 Research Design

The study employed a one-group pretest–posttest quasi-experimental action research design to determine the effectiveness of Comic-Designed Lessons (CDL) in improving Filipino reading comprehension among Grade 3 learners. A purposive sample of 23 pupils was assessed using Phil-IRI–based comprehension passages and questions before the intervention to establish baseline performance across literal, inferential, and critical levels. The CDL intervention was then implemented during regular Filipino classes for a defined period, integrating comics as structured instructional materials aligned with target competencies. After the intervention, the same (or parallel) comprehension test was administered as a posttest, and pretest–posttest mean scores and reading-level distributions (Independent, Instructional, Frustration) were compared. Statistical analysis—specifically a paired-samples t-test—was used to test whether the observed gains were significant, allowing the researcher to attribute changes in comprehension performance to the CDL strategy within the study's classroom context.

2.2 Participants

The participants of the study were twenty-three (23) Grade 3 learners from Tampac Integrated School, Aguilar, Pangasinan, who were purposively selected based on their identified reading comprehension needs in Filipino. The selected pupils represented varying Phil-IRI comprehension levels prior to the intervention—Independent, Instructional, and Frustration—ensuring that the strategy was tested across a realistic range of classroom abilities. They were enrolled in the same class where the researcher implemented the Comic-Designed Lessons (CDL) during regular Filipino periods, allowing the intervention to occur in an authentic instructional setting. Participation aligned with ethical standards in school-based action research, with learners included to diagnose learning gaps, provide targeted support, and evaluate measurable improvement after the CDL implementation.

2.3 Instrumentation

According to a July 2025 document, the study used a Phil-IRI–based Reading Comprehension Assessment as its primary research instrument, administered both as a pre-test and a post-test to 23 Grade 3 participants. The pre-test established baseline comprehension performance using a grade-appropriate Filipino reading passage adapted from the official Grade 3 Phil-IRI materials, along with comprehension questions that measured literal, inferential, and critical understanding. After the 20-day implementation of Comic-Designed Lessons (CDL), the post-test employed the same Phil-IRI framework and scoring metrics to ensure comparability of results. Test administration procedures and the computation of learners' comprehension levels (Independent, Instructional, Frustration) followed Phil-IRI guidelines, allowing the researcher to quantify changes in reading comprehension before and after the intervention.

2.4 Data Analysis

According to a 2025 document, the study's data analysis focused on quantifying and comparing learners' reading comprehension performance before and after the Comic-Designed Lessons (CDL) intervention, using descriptive and inferential statistics. Pre-test and post-test scores from the Phil-IRI–based comprehension assessment were first organized and summarized through frequency counts and percentages to describe how many learners fell under the Independent, Instructional, and Frustration levels at each testing phase. Means and standard deviations were computed to determine the group's average comprehension performance and score variability across the two administrations. To test whether the observed improvement after the 20-day CDL implementation was statistically meaningful, the researcher applied a paired-

samples t-test comparing the same participants' pre-test and post-test mean scores; this inferential procedure established whether the difference between the two sets of scores was significant and attributable to the intervention rather than chance. These combined statistical tools provided both a clear descriptive picture of reading-level shifts and a rigorous test of CDL effectiveness.

3 Results

According to a July 2025 document, the pre-test results showed that the Grade 3 learners initially exhibited generally low to moderate reading comprehension in Filipino. Using a 5-item Phil-IRI–based assessment, the group posted a mean score of 3.00 (SD = 0.85), indicating that many pupils answered only about three questions correctly and that performance varied across learners. Only six pupils (26.09%) were classified at the Independent level, while 10 pupils (43.48%) were at the Instructional level, and seven pupils (30.43%) were at the Frustration level. In total, 73.91% of learners required guided support or intensive intervention, clearly indicating the need for a targeted reading strategy such as CDL.

After 20 days of implementing Comic-Designed Lessons, the post-test results showed a marked improvement in comprehension. The mean increased to 4.09 (SD = 0.72), suggesting that pupils, on average, answered about 4 out of 5 questions correctly, and scores became more consistent across the class. Eighteen learners (78.26%) reached the Independent level, while only five learners (21.74%) remained at the Instructional level. Notably, no learner was classified in the Frustration level, indicating that the weakest readers in the pre-test moved up at least one comprehension category after exposure to CDL.

Comparing pre-test and post-test distributions highlights the magnitude of change. Independent readers increased from 26.09% to 78.26%, representing a gain of more than fifty percentage points, while the Frustration group dropped from 30.43% to 0%. This movement across levels implies that CDL not only improved average scores but also helped struggling readers overcome barriers that previously prevented them from comprehending Filipino texts meaningfully.

Inferential analysis confirmed that these gains were statistically significant. A paired-samples t-test comparing the same pupils' pre-test and post-test scores yielded a t-value of −8.74 and a p-value of 1.32×10^{-8}, far below the 0.05 alpha level. This result led to the rejection of the null hypothesis and supports the conclusion that the improvements were attributable to the CDL intervention rather than to chance or to routine classroom exposure alone.

Overall, the results demonstrate that Comic-Designed Lessons were highly effective in enhancing Filipino reading comprehension among Grade 3 learners in the study site. The combination of increased mean scores, the elimination of frustration-level readers, and the significant t-test outcome indicates that CDL provided engaging visual-text scaffolds that strengthened pupils' ability to understand and answer comprehension questions. While a small portion of learners still needed instructional support, the general upward shift suggests strong potential for CDL as a sustainable classroom-based reading intervention.

4. Discussion

The findings of the present study strongly corroborate with Philippine classroom-based research showing that comics or comic strips can raise comprehension scores and move learners from lower to higher reading levels. Similar to the large pretest–posttest gains found among Grade 3 pupils in Tampac Integrated School, a recent intervention for Grades 1–3 learners reported statistically significant improvement in reading proficiency after comic strips were used as remediation materials. That study emphasized that visuals paired with short, structured text helped young readers decode meaning more efficiently and sustain attention, resulting in better posttest outcomes than with traditional materials.

More specifically, the improvement pattern in this study aligns with Castro's (2023) experimental work on Grade 4 pupils, where the comics-strip group outperformed peers who used short stories. Castro noted that sequential images provided immediate context clues for vocabulary and plot, enabling pupils to answer comprehension questions more accurately and with greater confidence. The current study mirrors this mechanism: learners shifted substantially toward the Independent level after CDL exposure, suggesting that visual scaffolding likewise supported literal, inferential, and critical understanding in Filipino texts.

The results also confirm the conclusions of Bugtong et al. (2025), who found that English comics used as reading materials and intervention significantly enhanced primary pupils' comprehension, while also increasing enjoyment and classroom participation. Bugtong et al. argued that comics' blend of visuals and text reduced cognitive load and helped struggling readers build meaning without being overwhelmed by dense print. This parallels the present study's elimination of frustration-level readers after CDL, indicating that comics are beneficial across languages (English and Filipino) when adapted to learners' levels and curriculum goals.

Beyond local evidence, international research on graphic novels likewise supports the present outcome. Meuer (2018) reported that learners demonstrated better comprehension and memory of events when reading graphic-novel versions of texts compared to traditional formats, attributing gains to the same multimodal supports highlighted in CDL. This suggests that the positive impact observed in Grade 3 Filipino comprehension is consistent with broader findings that comics help learners integrate ideas through dual channels of meaning-making—visual and verbal.

Taken together, these related studies strengthen the interpretation that CDL's effectiveness is not an isolated classroom effect but part of a well-documented instructional advantage of multimodal texts. Across contexts, grade levels, and subject languages, comics consistently promote engagement, scaffold understanding, and yield measurable comprehension gains. Therefore, the present study extends the existing literature by demonstrating that comic-designed instruction can be systematically embedded in Filipino reading lessons and still yield outcomes comparable to those of prior Philippine and international interventions.

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ENHANCING MUSICALITY AND ENSEMBLE PERFORMANCE: A STUDY ON RONDALLA TRAINING TECHNIQUES

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Abstract

This study determined the effectiveness of newly developed rondalla training techniques in enhancing the musicality and ensemble performance of student musicians in Pangasinan. A quantitative, quasi-experimental, non-equivalent control-group design was employed because random assignment was not feasible. The participants were 300 purposively selected rondalla students from three secondary schools and two tertiary institutions during Academic Year 2024–2025, equally divided into an experimental group that received the new training techniques and a control group that continued traditional training. The intervention was implemented over one academic semester. Data were collected through three validated instruments: the Musicality Evaluation Rubric (rhythm, tone quality, expression), the Ensemble Performance Rating Scale (synchronization, blend/balance, cohesion), and a 20-item Perception Questionnaire measuring engagement with the new techniques. Descriptive statistics (mean and standard deviation) summarized performance and perception levels, and an independent-samples t-test examined group differences at the 0.05 level of significance.

Results revealed that the experimental group achieved a very high level of musicality after the intervention (M = 4.48, SD = 0.40), indicating notable improvement in rhythm, tone, and expression. Ensemble performance of the experimental group was likewise very high (M = 4.56) compared with the control group's high rating (M = 4.05). The t-test showed a statistically significant difference between groups ($p < 0.05$), confirming the effectiveness of the new training techniques in strengthening ensemble outcomes. Students also reported very high positive perceptions of the intervention (M = 4.54), reflecting strong engagement, motivation, and perceived benefits. Based on these findings, the study proposes the Rondalla Enhancement and Development (READ) Program to guide music teachers in integrating effective training strategies to improve musicality and ensemble performance.

Keywords: Rondalla, Training Techniques, Musicality, Ensemble Performance, Quasi-Experimental Design, Student Perception, READ Program

1. Introduction

Music education is recognized globally as a foundational component of holistic student development, facilitating cognitive, socio-emotional, and cultural competencies beyond the domain of music itself (Arts Education Partnership, 2011). Numerous policy frameworks and research syntheses underscore that engagement in music performance cultivates students' auditory discrimination, ensemble coordination, and aesthetic sensitivity, alongside broader psychological outcomes, including enhanced communication and teamwork skills (Bussu & Mangiarulo, 2024; Arts Education Partnership, 2011; *see URL below* for details). In ensemble contexts, learners not only interpret musical structures but also negotiate timing, synchrony, and expressive cohesion, thereby actualizing musicianship through collaborative interaction. Despite the well-documented educational benefits of music and ensemble participation, specific traditional music forms, such as the Philippine rondalla, remain underinvestigated within formal empirical literature despite their enduring cultural and pedagogical significance (Rockell, 2013).

The Philippine rondalla is a *plucked-string chordophone ensemble* comprising instruments such as the bandurria, laud, octavina, guitar, and bass, adapted from Spanish antecedents and localized over several centuries within Filipino musical traditions (Rockell, 2013). Although historically transmitted through aural learning and community-based practice, the ensemble has permeated formal school curricula as a prominent medium for fostering musical literacy and cultural identity (House Bill No. 11290, 2024). Legislative efforts in the Philippines have sought to institutionalize rondalla training programs for educators, recognizing that teacher preparation is critical to sustaining pedagogical quality and cultural preservation (*Inquirer.net*, 2024). This emergent policy emphasis reflects broader socio-cultural priorities: the preservation of indigenous music practices and the promotion of participatory music making as integral to national and educational heritage. However, despite such initiatives, there is a relative paucity of systematic research on how rondalla training influences core musical outcomes, particularly *musicality*—defined as the capacity for expressive interpretation and stylistic nuance—and *ensemble performance*—defined as coordinated group execution of musical works within educational settings.

The literature on ensemble music enriches the understanding of the socio-cognitive and affective dimensions of collaborative music performance. Studies in Western and educational contexts have documented that ensemble participation can enhance communicative competencies, interpersonal coordination, and life skills that extend into broader educational engagement and psychosocial well-being (Bussu & Mangiarulo, 2024). For example, adolescent musicians involved in classical ensembles reported increased self-confidence, effective communication, and critical thinking arising from collective rehearsals and performances in structured programmes (Bussu & Mangiarulo, 2024). Similarly, broader research on participatory music learning highlights that ensemble engagement supports interpersonal synchrony and cognitive-affective regulation, which are foundational components of musicianship and collaborative learning (Springer, 2023). Although this evidence provides valuable insights into ensemble dynamics and their developmental implications, *little of this research attends to culturally specific ensembles such as the rondalla*, where local traditions, repertoire, and performance practices may mediate educational outcomes in ways distinct from Western classical models.

The rondalla occupies a unique position within Philippine culture; it is both an emblem of national identity and a vehicle for community music education. Ethnomusicological studies have documented that the ensemble's characteristic timbral textures and performance practices are deeply intertwined with Filipino social life and aesthetic values (Rockell, 2013). However, *scholarly discourse indicates a general paucity of musicological and pedagogical research on the rondalla*, particularly within formal educational frameworks. This gap is significant given that rondalla training programmes have expanded across schools and teacher education, yet systematic investigations into their effectiveness in promoting musicality and ensemble performance remain limited. The need for such research is further underscored by contemporary policy discussions in the Philippines, where legislative proposals advocate for the creation of structured rondalla training for music teachers to enhance instructional quality and cultural continuity (House Bill No. 11290, 2024).

Conceptually, the development of *musicality* involves not only technical proficiency but also interpretive sensitivity, stylistic awareness, and expressive coherence, all of which are cultivated through sustained engagement with music making (Arts Education Partnership, 2011). Ensemble performance, in turn, requires adaptive synchronization, mutual responsiveness, and shared interpretive intent among musicians, making it an ideal domain for studying collaborative musicianship as both a product and process of instructional practices. Research on ensemble interaction highlights that performance quality is shaped by collective adaptation, communicative cues, and rehearsal strategies, suggesting that instructional approaches to ensemble training

significantly shape musical outcomes. However, these principles have primarily been established in Western art-music research contexts, necessitating context-specific investigation into how indigenous ensemble forms such as the rondalla manifest and enhance these processes in Philippine music education.

Despite its deep cultural roots and widespread participation in schools, *rondalla research has not yet extensively examined the pedagogical mechanisms through which rondalla training fosters musicality and ensemble performance*. Existing literature on Filipino rondalla practices tends to emphasize ethnographic and heritage dimensions rather than educational efficacy and performance outcomes. Moreover, while ensemble participation has been linked to affective and cognitive benefits in diverse contexts, *a research gap persists in empirically examining how culturally situated ensemble training influences fundamental musical competencies among student musicians within Philippine schools.*Addressing this gap is timely and relevant for informing both music education policy and instructional design, aligning empirical inquiry with ongoing efforts to support teacher preparation and curriculum development in indigenous music traditions.

This study therefore investigates the effects of structured rondalla training on students' musicality and ensemble performance, aiming to bridge a critical gap in music education research and to provide evidence-based insights to support culturally responsive pedagogy. Specifically, the research examines how targeted instructional strategies influence expressive musicianship and coordinated ensemble execution within school-based rondalla programmes. By integrating theoretical perspectives on musicianship, ensemble interaction, and culturally situated music education, this study advances understanding of how traditional ensemble training contributes to musical development in contemporary classroom settings.

2. Method

2.1 Research Design

This study employed a quantitative, quasi-experimental research design, specifically a non-equivalent control group design, to determine the effectiveness of newly developed rondalla training techniques in enhancing students' musicality and ensemble performance. Random assignment of participants was not feasible because the rondalla members were drawn from pre-existing school and institutional ensemble groupings; therefore, two naturally constituted groups were used for comparison: (a) an experimental group that received the newly developed training techniques and (b) a control group that continued with traditional rondalla training.

The intervention was implemented over one academic semester. Following the implementation period, both groups were evaluated using standardized performance-based measures to determine post-intervention levels of musicality—operationalized through rhythm, tone, and expression—and ensemble performance—operationalized through synchronization, blend/balance, and cohesion/interpretative unity. Quantitative data generated from rubric-based ratings and scaled instruments were summarized using descriptive statistics (mean and standard deviation). To test whether the observed post-test difference in ensemble performance between the experimental and control groups was statistically significant, an independent-samples t-test was applied at the 0.05 level of significance. Statistical processing was conducted using SPSS (Version 26) to ensure consistency and accuracy of computation.

2.2 Participants

The participants in the study were 300 purposively selected student rondalla musicians from three secondary schools and two tertiary institutions in Pangasinan during Academic Year 2024–2025. All participants were active members of their respective school-based rondalla ensembles, regularly attended rehearsals, and had at least one

year of ensemble-playing experience, ensuring that they possessed adequate foundational skills for the implementation and evaluation of the training intervention. Participants represented the major rondalla instrument sections, including bandurria, laud, octavina, guitar, and bass, reflecting authentic ensemble composition in school and institutional settings.

For comparative analysis, the participants were distributed into two non-randomized groups of equal size: 150 studentscomprised the experimental group, which received the newly developed rondalla training techniques over one academic semester, while the remaining 150 students comprised the control group, which continued with traditional rondalla training methods implemented within the same institutional context. The use of purposive sampling was appropriate because the study required participants with prior rondalla experience to ensure valid assessment of performance outcomes and comparability of baseline ensemble membership characteristics across groups.

2.3 Instrumentation

Three quantitative instruments were used to measure the effects of the newly developed rondalla training techniques on students' musicality, ensemble performance, and perceptions of the intervention: (1) the Musicality Evaluation Rubric, (2) the Ensemble Performance Rating Scale, and (3) the Perception Questionnaire on Rondalla Training Techniques. All instruments were subjected to expert content validation by music educators, rondalla conductors, and research specialists to establish appropriateness and alignment with the study objectives. Pilot testing indicated high internal consistency with an overall reliability coefficient of Cronbach's alpha = 0.92, supporting the suitability of the instruments for quantitative analysis.

The Musicality Evaluation Rubric assessed individual musicianship in three domains: rhythm, tone, and expression. Each domain was rated on a 5-point scale from 1 (needs improvement) to 5 (excellent), with higher scores indicating stronger musicality as demonstrated through timing accuracy, sound quality control, and expressive interpretation.

The Ensemble Performance Rating Scale evaluated group-level performance outcomes, focusing on the collective execution of rondalla pieces in terms of synchronization, blend/balance, and cohesion/interpretative unity. Ensemble performances were video-recorded to support consistent scoring and to reduce rater bias. Trained music adjudicators applied the scale using a standardized numerical scoring procedure, allowing direct quantitative comparison of ensemble outcomes between the experimental and control groups.

The Perception Questionnaire on Rondalla Training Techniques measured students' engagement and attitudes toward the newly developed training techniques. The questionnaire consisted of 20 Likert-type items, rated from 1 (strongly disagree) to 5 (strongly agree). It was designed to quantify perceptions of instructional effectiveness, enjoyment, motivation, and confidence, as well as the perceived relevance of the intervention to performance improvement. Mean scores were interpreted using the scale descriptors applied in the study, with higher mean values indicating more favorable perceptions.

2.4 Data Analysis

All quantitative data obtained from the Musicality Evaluation Rubric, Ensemble Performance Rating Scale, and Perception Questionnaire were encoded and analyzed using the Statistical Package for the Social Sciences (SPSS), Version 26. Prior to analysis, the data set was screened for completeness and accuracy to ensure the validity of statistical procedures.

Descriptive statistics, specifically the mean and standard deviation, were computed to determine the post-intervention levels of students' musicality in terms of rhythm, tone, and expression, the ensemble performance levels of the experimental and control groups, and the level of positive perception of students toward the newly developed rondalla training

techniques. These measures were used to summarize central tendency and variability of scores across all indicators.

To examine the effectiveness of the training intervention, an independent-samples t-test was used to compare post-test ensemble performance scores between the experimental and control groups. This inferential statistical test was appropriate because it assessed the difference in means between two independent groups exposed to different instructional conditions. The test was conducted at the 0.05 level of significance, and a statistically significant result was determined when the computed *p*-value was less than 0.05.

All statistical results were reported using standard conventions, including test statistics, degrees of freedom where applicable, and exact *p*-values, to ensure transparency and reproducibility of the findings.

3 Results

The musicality of rondalla students who received the new training techniques was assessed in terms of rhythm, tone, and expression. The results showed that the experimental group attained a very high level of musicality after one academic semester, with an overall mean score of 4.48 (SD = 0.40).

Among the three musicality components, rhythm obtained the highest mean score (M = 4.52, SD = 0.38), followed by expression (M = 4.48, SD = 0.40) and tone quality (M = 4.45, SD = 0.42). All three indicators fell within the “very high” descriptive range, indicating that the training techniques were effective in enhancing students’ rhythmic accuracy, tonal control, and expressive interpretation.

The study presents the ensemble performance scores for the experimental and control groups. The results revealed that students who underwent the newly developed rondalla training techniques achieved a very high ensemble performance level (M = 4.56, SD = 0.39). In contrast, the control group, which continued with traditional training methods, obtained a high ensemble performance level (M = 4.05, SD = 0.47).

The higher mean score of the experimental group indicates superior outcomes in synchronization, blend/balance, and overall ensemble cohesion compared with the control group. These findings suggest that structured, reflective training techniques contributed to stronger group coordination and unified performance.

An independent-samples t-test was conducted to determine whether the observed difference in ensemble performance between the two groups was statistically significant. The results showed a mean difference of 0.51 in favor of the experimental group. The computed t-value was 7.24, with a corresponding p-value of 0.000, which is lower than the 0.05 level of significance.

These results indicate a statistically significant difference between the ensemble performance scores of students who received the new training techniques and those who received traditional training. Thus, the null hypothesis stating that there is no significant difference between the two groups was rejected. The findings confirm that the newly developed rondalla training techniques had a significant positive effect on ensemble performance.

The level of students’ positive perception toward the newly developed rondalla training techniques was also examined. The results revealed a very high overall perception mean score of 4.54 (SD = 0.39).

Among the perception indicators, engagement and enjoyment received the highest mean score (M = 4.63, SD = 0.36), followed by motivation and confidence (M = 4.55, SD = 0.40), learning effectiveness (M = 4.50, SD = 0.41), and application and relevance (M = 4.48, SD = 0.39). All indicators were interpreted as “very high,” indicating that students perceived the training techniques as engaging, effective, and relevant to their musical development.

Overall, the results demonstrate that the newly developed rondalla training techniques significantly enhanced students' musicality and ensemble performance while fostering strong positive perceptions and engagement among participants.

4. Discussion

The present study examined whether newly developed rondalla training techniques could enhance student musicians' musicality and ensemble performance within school-based contexts. The results indicate that the intervention was associated with (i) very high post-intervention musicality (overall $M = 4.48$, $SD = 0.40$), (ii) higher ensemble performance for the experimental group ($M = 4.56$, $SD = 0.39$) relative to the control group ($M = 4.05$, $SD = 0.47$), and (iii) a statistically significant difference in ensemble performance between groups ($t = 7.24$, $p < .05$), alongside very high student perceptions of the approach (overall $M = 4.54$, $SD = 0.39$). Collectively, these findings suggest that the training techniques served as an effective pedagogical intervention, strengthening both individual musicianship (rhythm, tone, expression) and collective ensemble outcomes (synchronization, blend/balance, cohesion).

The experimental group's very high musicality scores—particularly in rhythm ($M = 4.52$), tone ($M = 4.45$), and expression ($M = 4.48$) —are consistent with a growing body of research emphasizing that musical expressiveness and interpretive competence can be systematically developed through structured teaching strategies rather than assumed as an incidental by-product of repetition. In particular, dialogic teaching and teacher modeling have been identified as key mechanisms through which young musicians develop expressive awareness and musical agency. Meissner and Timmers (2020) reported that dialogic instruction supported by modeling stimulates pupils' thinking about musical character and interpretive choices, thereby enhancing expressiveness in performance. Meissner's subsequent theoretical framework further explains how expressive learning is facilitated when instruction integrates interpretive dialogue, reflective thinking, and guided examples, making expressiveness teachable and assessable.

The pattern observed in this study—simultaneous improvement in rhythmic control and expressive interpretation—aligns with the view that musicality emerges from the interaction of technical fluency and meaning-making. When learners receive explicit prompts to shape phrasing, control tone color, and align rhythmic intention with ensemble pulse, they are more likely to demonstrate musical outcomes that extend beyond accuracy toward artistry. The rondalla context may further amplify the salience of these skills, as its idiomatic sound depends heavily on coordinated articulation, tremolo control, and melodic-accompanimental hierarchy—elements that require intentional teaching, not merely rehearsal time.

The experimental group's superior ensemble performance and the significant between-group difference support the broader conclusion that ensemble cohesion improves when rehearsals deliberately train listening, synchronization, and adaptive coordination. Research on ensemble pedagogy highlights that ensemble skill is not reducible to aggregated individual technique; rather, it is an interpersonal capability involving attention, responsiveness, and shared interpretive alignment. In a pandemic-era study on training ensemble skills, Karkina et al. (2022) demonstrated that structured, interactive tasks ("e-tivities") can improve ensemble-related competencies by requiring learners to engage in focused coordination activities, reflective listening, and iterative feedback cycles—even in constrained instructional conditions.

Similarly, qualitative evidence from music teachers indicates that ensemble development depends on pedagogical practices that support group dynamics and listening habits. Schiavio et al. (2020) emphasize that teachers view ensemble skills as intertwined with learning skills—particularly listening, mutual adaptation, and the ability to maintain productive social-performative dynamics within a group. These perspectives align with the present findings: the experimental group's higher scores plausibly reflect training sequences that made coordination goals explicit rather than relying solely on conductor-led demonstration.

From a learning-theory standpoint, embodied music cognition provides an additional explanation for why structured ensemble training may strengthen synchronization and cohesion. Bremmer and Nijs (2024) outline how entrainment, alignment, and prediction—core processes in ensemble coordination—are supported by embodied strategies such as gesture, physical modeling, and movement-based timing cues. In rondalla rehearsal, where synchronized plectrum articulation and consistent pulse are central to ensemble clarity, embodied cueing and movement-supported internal pulse training may help stabilize group timing and enhance collective precision. Thus, the observed gains in synchronization and cohesion are consistent with research indicating that embodied rehearsal strategies can improve ensemble alignment and shared temporal frameworks.

Students reported very high positive perceptions of the training techniques (M = 4.54), with particularly strong ratings for engagement and enjoyment (M = 4.63). This is pedagogically significant: interventions that improve performance but reduce learner motivation can be difficult to sustain in real school conditions. The present results instead suggest that the new techniques were not only effective but also acceptable and motivating to learners.

Related research supports the linkage between ensemble participation, motivation, and perceived personal growth. Bussu and Mangiarulo (2024), for example, found that adolescents involved in ensemble music-making reported benefits in communication, teamwork, and self-confidence, alongside challenges that required adaptive learning and persistence. While their work focused on a different ensemble tradition, it reinforces the general point that structured ensemble experiences can foster both musical and socio-emotional development, which in turn support continued engagement and practice.

A further implication concerns assessment design. In school music contexts, what is taught is often shaped by what is evaluated. The study's use of structured rubrics for musicality and ensemble performance aligns with recommendations in Philippine music education research that emphasize the need for systematic, performance-based assessment tools. Tabuena et al. (2021) discuss how music assessment techniques in the Philippine K–12 context should capture meaningful performance outcomes to support skill transfer and instructional improvement. The present findings suggest that when musicality dimensions (rhythm, tone, expression) and ensemble outcomes (synchronization, blend/balance, cohesion) are operationalized and measured consistently, instructional interventions can be evaluated with greater clarity, supporting evidence-based refinement of rondalla pedagogy.

Finally, the findings contribute to a limited but important body of scholarship on the rondalla as a culturally significant ensemble form. Ethnomusicological work underscores the rondalla's role in Filipino identity and its enduring place in Filipino musical soundscapes, including in diaspora contexts. Rockell (2013) highlights the rondalla's role in cultural transmission and its symbolic connection to Philippine national identity. Within schools, this cultural function intersects directly with pedagogy: improving rondalla musicality and ensemble performance strengthens not only technical outcomes but also the quality and credibility of cultural performance and heritage transmission. In this respect, the study's results support the educational value of investing in structured rondalla training approaches that are both musically rigorous and culturally sustaining.

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INSTRUCTIONAL AND ADMINISTRATIVE LEADERSHIP OF SCHOOL HEADS IN DASOL DISTRICT

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Abstract

This study assessed the instructional and administrative leadership practices of public-school heads in Dasol District, Pangasinan, during the 2024–2025 school year. Anchored on systems, instructional, distributed, servant, and situational leadership theories, it examined how school heads perform their dual roles in curriculum implementation and supervision, teacher professional development, classroom observation and feedback, resource management, personnel management, and school–community partnership. Using a descriptive–correlational design, the study involved all twenty (20) school heads in the district through a researcher-developed, validated, and reliability-tested survey questionnaire. Data were treated using frequency, percentage, mean, standard deviation, Pearson-r correlation, and t-test. Results revealed a very high level of instructional and administrative leadership practices across all domains, indicating that school heads consistently ensured curriculum fidelity, supported teachers' continuous professional growth, monitored classroom instruction, managed resources efficiently, and sustained strong stakeholder collaboration. No significant differences in leadership practices were found across sex and educational attainment; however, seminars attended showed a significant positive relationship with leadership practices, underscoring the importance of continuous professional development. Despite their high level of competence, school heads reported challenges in balancing instructional and administrative responsibilities, particularly in managing time and workload. The study concludes that while leadership practices in Dasol District are commendable, policy support, targeted training, and workload management strategies are necessary to strengthen further school heads' capacity to sustain instructional excellence and effective school management. The findings provide empirical evidence to inform the Department of Education and local stakeholders in designing context-responsive leadership development programs for rural districts similar to Dasol.

Keywords: Instructional Leadership, Administrative Leadership, School Heads, Dasol District, Professional Development, Resource Management

1. Introduction

The quality of school leadership is widely recognized as a key determinant of educational performance. International evidence consistently shows that, after classroom instruction, school leadership is the second most influential school-based factor affecting student learning outcomes (Leithwood & Louis, 2012; Neufeld, 2019). Effective school heads shape vision and direction, nurture teacher quality, and create organizational conditions that enable productive teaching and learning. In contemporary education systems characterized by accountability pressures, curriculum reforms, and heightened community expectations, the work of school heads has become increasingly complex, requiring them to perform demanding instructional and administrative roles simultaneously (Hallinger et al., 2020).

Instructional leadership focuses on the "core business" of schools—teaching and learning. It typically includes defining the school's mission, managing the instructional program, and promoting a positive school learning climate (Hallinger & Murphy, 1985, as cited in Hallinger, 2011). Recent meta-analyses affirm that instructional leadership has a significant, albeit largely indirect, effect on student achievement by influencing teacher practices, school culture, and the

use of assessment data (Hallinger et al., 2020; Robinson et al., 2008, as cited in Hallinger et al., 2023). Likewise, administrative or managerial leadership—which encompasses resource management, personnel administration, policy compliance, and stakeholder relations—provides the structural and organizational foundation that enables instructional initiatives to succeed (Leithwood et al., 2008; Neufeld, 2019). For school heads, these two dimensions of leadership are inseparable in practice but are often examined separately in research.

In the Philippines, the centrality of school leadership is formally recognized in several Department of Education (DepEd) policies. The National Adoption and Implementation of the Philippine Professional Standards for School Heads (PPSSH) through DepEd Order No. 024, s. 2020 positions school heads as "stewards of schools" responsible for ensuring enabling environments for effective teaching and learning (Department of Education [DepEd], 2020). The PPSSH organizes leadership expectations into five domains: leading strategically, managing school operations and resources, focusing on teaching and learning, developing self and others, and building connections (TeacherPH, n.d.; DepEd, 2020). These domains integrate instructional and administrative leadership functions and provide a coherent framework for professional development, self-assessment, and career progression of school heads.

Concurrently, DepEd's revised School-Based Management (SBM) policy under DepEd Order No. 007, s. 2024 reinforces the decentralization of authority to the school level and emphasizes shared leadership, participatory decision-making, and stakeholder engagement (DepEd, 2024; EDSes SBM Portal, n.d.). Under SBM, school heads are expected to spearhead planning, resource mobilization, community partnerships, and accountability systems, while ensuring that curriculum implementation and instructional supervision remain strong. These overlapping expectations intensify the dual instructional and administrative load of school heads, particularly in small or resource-constrained districts.

Empirical studies in the Philippine context show that many school heads demonstrate high levels of leadership practice aligned with the PPSSH domains. Research across different divisions has reported that school heads are generally rated "very satisfactory" or "highly competent" in strategic leadership, resource management, and teaching and learning (Dellomas & Deri, 2022; Madarang, 2023; Umingan & colleagues, 2024). Studies have also found significant relationships between school heads' instructional leadership and teachers' performance or school outcomes, highlighting the importance of continuous professional development and effective supervision (Naguit, 2024; Barola, 2022, as cited in School Heads' Leadership Practices in Relation to Teachers' Performance, 2024). However, the literature also notes persistent challenges, such as heavy workloads, administrative overload, and the difficulty of maintaining instructional focus amid competing bureaucratic demands (Leithwood et al., 2008; DepEd Bohol, 2020; Cabigao, 2021).

Within this national policy and research landscape, rural and coastal municipalities such as Dasol in Pangasinan present unique contextual demands. Dasol is a small coastal municipality in the first congressional district of Pangasinan, known primarily for its salt-making, aquaculture, and agriculture-based economy (Province of Pangasinan, 2023; PhilAtlas, 2021). With a relatively small and dispersed population across several barangays, schools in Dasol often operate in geographically isolated or hard-to-reach communities, where access to resources, professional development, and support services may be limited. The Dasol Schools District Office oversees both elementary and secondary schools in this setting and is tasked with ensuring the effective delivery of basic education services. In such a context, school heads' capacity to perform both instructional and administrative leadership roles effectively is crucial for sustaining educational quality and equity.

Despite the growing body of Philippine research on school leadership, there remain few studies that specifically examine the combined instructional and administrative leadership practices of school heads in small, rural, and coastal districts like Dasol, Pangasinan. Existing studies often focus on larger urban divisions, specific leadership domains, or selected school

types (e.g., multi-grade schools, secondary schools, or particular regions), leaving a contextual gap with respect to the realities of leadership in geographically isolated and economically modest municipalities (Dellomas & Deri, 2022; Madarang, 2023; IOER-IMRJ, 2024). Furthermore, there is a continuing need to explore the relationship between school heads' leadership practices and their demographic and professional profiles, such as sex, educational attainment, and participation in seminars and training, to inform targeted development interventions.

This study was therefore conceptualized to assess the instructional and administrative leadership of school heads in the Dasol District, Schools Division of Pangasinan I, for School Year 2024–2025. Anchored in the PPSSH framework and relevant leadership theories, the study examines the practice levels of school heads across key instructional and administrative domains. It determines whether these practices vary across selected profile variables. In doing so, it seeks to generate empirical evidence that reflects the lived realities of school heads in a rural coastal district and to surface specific areas where policy support, capacity-building, and workload-management strategies may be strengthened. The findings are expected to inform DepEd officials, local government units, and other stakeholders in designing responsive leadership development programs and support mechanisms that will further enhance the instructional and administrative leadership of school heads in Dasol and similarly situated rural districts.

2. Method

2.1 Research Design

This study employed a quantitative, descriptive–correlational research design to determine the levels of instructional and administrative leadership practices among school heads in the Dasol District and to examine their relationships with selected profile variables. As a descriptive study, it sought to systematically and accurately portray how school heads perform key leadership functions in curriculum implementation and supervision, teacher professional development, classroom observation and feedback, resource management, personnel management, and school–community partnership during School Year 2024–2025. At the same time, the correlational component examined whether leadership practices varied significantly across groups defined by sex, highest educational attainment, and the number of seminars or training sessions attended relevant to school leadership and management. The design was non-experimental and cross-sectional, using a researcher-developed survey questionnaire content-validated by experts and subjected to reliability testing before full administration. Data were collected from all public school heads in the district through a complete enumeration. They were analyzed using appropriate descriptive (frequency, percentage, mean, and standard deviation) and inferential (Pearson's r correlation and t-tests for independent samples) statistics to determine patterns, relationships, and differences in their instructional and administrative leadership practices.

2.2 Participants

The participants of the study were all public-school heads assigned in the Dasol District, Schools Division of Pangasinan I, during School Year 2024–2025. A complete enumeration technique was used instead of sampling, as the total number of school heads in the district was manageable and their full participation was deemed necessary to obtain a comprehensive picture of instructional and administrative leadership practices in the local context. The respondents included both male and female school heads from elementary and secondary schools, occupying positions such as Head Teacher, Teacher-in-Charge, and School Principal, thereby representing the full range of leadership designations present in the district. Their demographic and professional profiles were described in terms of sex, highest educational attainment, length of service as school head, and number of seminars, trainings, or workshops attended related to

school leadership and management. These profile variables were used not only to characterize the group but also to examine whether differences in leadership practices were associated with attributes that may have implications for leadership development, capacity building, and policy support for school heads in the Dasol District.

2.3 Instrumentation

The primary data-gathering instrument of the study was a researcher-developed survey questionnaire designed to measure the instructional and administrative leadership practices of school heads in the Dasol District. The instrument consisted of three main parts: (1) a profile sheet that elicited respondents' demographic and professional characteristics such as sex, highest educational attainment, length of service as school head, and number of seminars or trainings attended related to school leadership and management; (2) a set of items on instructional leadership covering domains such as curriculum implementation and supervision, classroom observation and feedback, teacher professional development, and monitoring of learning outcomes; and (3) a set of items on administrative leadership focusing on resource management, personnel administration, school–community partnership, and compliance with DepEd policies and standards. The leadership items were structured along a four-point Likert scale indicating the extent to which each practice was carried out (e.g., 4 – Always, 3 – Often, 2 – Sometimes, 1 – Rarely), thereby allowing quantitative assessment of the level of practices. To ensure content validity, the draft questionnaire was reviewed and evaluated by a panel of experts composed of experienced school heads and research specialists, after which necessary revisions in wording, clarity, and alignment with the Philippine Professional Standards for School Heads were made. A pilot test was conducted in a neighboring district with similar characteristics, and the instrument's reliability was established using Cronbach's alpha, yielding coefficients within the acceptable range, indicating that the questionnaire was internally consistent and suitable for full administration to the target respondents.

2.4 Data Analysis

Data gathered through the researcher-developed questionnaire were coded, tallied, and processed using appropriate descriptive and inferential statistical techniques. Frequencies and percentages were computed to describe the demographic and professional profiles of the school heads regarding sex, highest educational attainment, length of service, and the number of seminars or training sessions attended related to school leadership and management. To determine the level of instructional and administrative leadership practices across the different domains, weighted means and standard deviations were calculated, and the resulting mean scores were interpreted using a pre-defined verbal interpretation scale (e.g., 3.50–4.00 = Very High, 2.50–3.49 = High, and so on) to facilitate qualitative description of the quantitative results. For the inferential component, Pearson's r correlation was employed to examine the relationship between school heads' leadership practices and their continuous profile variables (e.g., length of service and the number of relevant seminars or training sessions attended). At the same time, a t-test for independent samples was used to test for significant differences in leadership practices across sex and highest educational attainment groups. All hypotheses were tested at the 0.05 level of significance, and the results of the analyses were summarized in tables and interpreted in relation to the study's objectives, the Philippine Professional Standards for School Heads, and relevant literature on instructional and administrative leadership.

3. Results

The analysis of the instructional leadership practices of school heads in the Dasol District revealed consistently very high mean ratings across all domains. Specifically, school heads reported *consistently* implementing curriculum standards, monitoring instructional activities, and

providing timely feedback through classroom observations. Furthermore, they frequently facilitated professional development opportunities and encouraged data-driven decision-making in classrooms. These findings indicate that instructional leadership is a strong area of competence among school heads, reflecting their commitment to improving teaching and learning. Moreover, the uniformity of high scores suggests a shared understanding of instructional priorities aligned with the Philippine Professional Standards for School Heads (PPSSH).

In addition, the administrative leadership practices of school heads were also rated very high, demonstrating strong performance in managing school operations, resources, personnel, and community partnerships. School heads consistently ensured the efficient allocation of financial and material resources, maintained transparent records, and sustained positive relationships with stakeholders. Likewise, they adhered strictly to DepEd policies and facilitated participatory governance through School-Based Management (SBM). Consequently, these administrative strengths contributed to a supportive school environment that enables effective delivery of basic education services. Taken together, the results show that school heads in Dasol are not only instructional leaders but also effective managers capable of maintaining organizational stability and compliance.

Finally, inferential analysis revealed no significant differences in leadership practices across sex and highest educational attainment groups, suggesting that these demographic factors did not influence how school heads performed their instructional or administrative functions. However, the number of seminars or trainings attended demonstrated a significant positive relationship with leadership practices, indicating that continuing professional development plays an essential role in enhancing leadership competence. This finding reinforces national policy directions emphasizing the need for continuous capacity building among school leaders. Overall, the results highlight a generally strong leadership profile among school heads in the district, while underscoring the value of sustained training to strengthen their instructional and administrative effectiveness further.

4. Discussion

The results of the present study are broadly corroborated by recent Philippine and international literature on school leadership, particularly regarding the consistently high levels of instructional and administrative practices reported by school heads. For example, Dellomas and Deri (2022) found that school heads in Bulan District demonstrated a “very great” extent of leadership practice across all five domains of the Philippine Professional Standards for School Heads (PPSSH), mirroring the very high ratings obtained in Dasol District. Similarly, Valmores (2021) reported that school heads in Misamis Oriental demonstrated strong administrative and instructional leadership skills that significantly influenced school performance, reinforcing the idea that robust leadership practices are now common among public school heads operating under the PPSSH framework. More recently, a study on school heads’ leadership practices in relation to teachers’ performance likewise concluded that public school heads generally manifest high to very high levels of leadership across planning, organizing, and other domains, consistent with the findings of this study in Dasol.

In terms of instructional leadership, the strong practices reported by Dasol school heads align with research that links effective instructional leadership to improved teacher performance and supervisory outcomes. Naguit (2024) established a significant positive relationship between the extent of instructional leadership practices of school heads and teachers' performance in instructional supervision, emphasizing the importance of curriculum monitoring, feedback, and coaching—areas that were also rated very highly in the present study. Likewise, Aquino, Afalla, and Fabelico (2021) found that school heads’ leadership practices in planning, organizing, controlling, commanding, and coordinating were all rated “very high,” and that such practices were associated with very satisfactory teacher performance. Parallel findings were reported by Leonor

and Rodriguez (2023) in their study on administrative performance and instructional leadership, in which school heads' leadership practices were positively associated with teachers' teaching performance in public elementary schools. Taken together, these studies substantiate the present study's implication that the strong instructional leadership observed in Dasol is likely to have beneficial effects on the quality of teaching and learning, even though teacher performance was not directly measured in this research.

Furthermore, the very high ratings in administrative leadership in the present study—particularly in resource management, personnel administration, and school–community partnership—are consistent with previous work highlighting the centrality of managerial competence in enabling instructional success. Valmores (2021) underscored that the administrative and leadership skills of school heads, including school management operations and community partnership, significantly contribute to school performance. In a complementary vein, a recent phenomenological study on resource management through the lens of school heads emphasized the importance of strategic, collaborative resource stewardship to address scarcity and support school improvement, echoing the strong resource management practices reported in Dasol. Likewise, studies that jointly examine administrative performance and instructional leadership have shown that both dimensions are positively associated with teachers' teaching performance, reinforcing the conclusion that the dual instructional–administrative competence displayed by Dasol school heads provides a solid foundation for effective school governance. Regarding the role of profile variables, this study's finding that leadership practices did not significantly differ across sex and highest educational attainment groups is partially corroborated by prior research. For example, Aquino et al. (2021) reported that teachers' performance remained consistent regardless of age and educational attainment, suggesting that these demographic variables do not necessarily translate into large performance differences in school settings. However, Madarang (2023), in examining leadership and management practices of multi-grade school heads in Camarines Norte through the PPSSH domains, found significant relationships between certain leadership domains and profile variables such as age, educational attainment, and plantilla position, indicating that the influence of profile characteristics may vary across contexts and leadership aspects. Notably, the Dasol findings that seminars and trainings attended have a significant positive relationship with leadership practices are strongly supported by Pana (2024), who demonstrated that attendance in leadership-related seminars is positively associated with enhanced instructional leadership and overall performance of school heads. A recent systematic literature review on leadership competencies of school heads likewise concluded that ongoing professional development is a critical enabler of effective school leadership, reinforcing the present study's recommendation for sustained training interventions.

Finally, the challenges reported by Dasol school heads in balancing instructional and administrative responsibilities resonate with qualitative accounts of leadership complexities in small, rural, and multigrade contexts. Bojos et al. (2025) described how multigrade school heads face considerable difficulty juggling teaching and administrative work amid limited staffing and resources, highlighting themes of workload intensification and the need for policy and support mechanisms—concerns similar to those raised by the respondents in Dasol. Likewise, exploratory studies on newly appointed multi-grade school leaders have documented role ambiguity, increased workloads, and limited access to tailored leadership training, all of which complicate efforts to sustain strong instructional leadership while managing operational demands. Studies of school heads' leadership practices during the "new normal" have also pointed to the expansive and time-sensitive nature of school leadership functions, underscoring the need for systemic support to prevent overload and burnout. In this regard, the present study both corroborates and extends existing literature by confirming that even highly competent school heads in a rural coastal district continue to struggle with time and workload pressures, thereby strengthening the

argument for policy measures and capacity-building programs that specifically address the dual instructional and administrative demands placed on school heads in contexts similar to Dasol.

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LEADERSHIP PRACTICES AND MANAGERIAL COMPETENCE OF SCHOOL HEADS IN SAN FABIAN: BASIS FOR A CAPACITY-BUILDING PROGRAM

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Abstract

This study evaluated the leadership practices and managerial competence of public school heads in San Fabian, Pangasinan. It examined the relationship between these two constructs as a basis for a localized capacity-building program. A quantitative descriptive–correlational design was employed using total population sampling. Data were gathered through a structured questionnaire aligned with standards-based leadership expectations and analyzed using descriptive statistics, Pearson's product–moment correlation, independent samples *t*-test, and one-way ANOVA at a 0.05 level of significance. Results indicated that school heads demonstrated high leadership practices (overall mean = 4.29), with the strongest indicators in resource management, accountability and transparency, and vision and direction-setting. Managerial competence was rated very high (overall mean = 4.33), particularly in school planning, administrative transparency, and financial management. Pearson correlation analysis revealed a strong and statistically significant positive relationship between leadership practices and managerial competence ($r = .752$, $p < .001$), indicating that higher leadership practice scores were associated with higher levels of managerial competence. Comparative analyses further showed that leadership practices did not differ significantly by sex or educational attainment, whereas managerial competence varied significantly by years of service as a school head. The findings suggest that strengthening school leadership should be approached as an integrated development of both leadership and managerial competencies, with differentiated support for less experienced school heads. A standards-aligned capacity-building program emphasizing instructional support, shared decision-making, delegation, and monitoring and evaluation is recommended.

Keywords: School Leadership, Managerial Competence, Leadership Practices, School Heads, Capacity-Building Program

1. Introduction

Effective school leadership is widely recognized as one of the most consequential in-school factors associated with educational quality, organizational performance, and learner outcomes. International evidence synthesizes that leadership contributes to improvement primarily through indirect pathways—shaping school culture, improving the quality of instruction, strengthening professional learning, and enabling data-informed decision-making (Day, 2020; Hallinger & Wang, 2020; Leithwood, 2021). In many systems, this has prompted renewed investment in leadership standards, leadership preparation, and continuous professional development for school principals and heads. The 2024/2025 UNESCO Global Education Monitoring (GEM) Report underscores that leadership is central to quality education, and that leaders at multiple levels—from schools to system governance—must be strengthened to support learning and equity (UNESCO, 2024). Within this global framing, the Philippine basic education system has adopted a competency-based approach to defining and advancing school leadership, institutionalizing professional standards intended to translate policy goals into coherent school-level practices.

In the Philippines, the Department of Education (DepEd) has progressively formalized expectations for school leaders through competency frameworks and standards. The National Competency-Based Standards for School Heads (NCBSSH), adopted through DepEd Order No. 32, s. 2010, provided an earlier national structure for articulating the roles, functions, and competency requirements of school heads, linking leadership performance to training and development systems anchored in Republic Act No. 9155 and the Basic Education Sector Reform Agenda (Department of Education [DepEd], 2010). This framework signaled a shift away from viewing leadership as an informal extension of seniority and toward treating leadership competence as measurable, developable, and accountable. A decade later, DepEd institutionalized the Philippine Professional Standards for School Heads (PPSSH) through DepEd Order No. 24, s. 2020, further strengthening competency-based leadership development by defining domains, strands, and indicators across leadership career stages (DepEd, 2020). The PPSSH outlines five integrated domains—Leading Strategically; Managing School Operations and Resources; Focusing on Teaching and Learning; Developing Self and Others; and Building Connections—providing a standards-based architecture for performance management and professional learning. This policy direction aligns with international reforms that emphasize instructional leadership and strategic management as inseparable capacities required of modern principals (Hallinger & Wang, 2020; Leithwood, 2021).

However, while standards provide a normative benchmark, their real value depends on the degree to which they translate into consistent leadership practices and measurable managerial competence in schools. The UNESCO GEM Report (2024/2025) notes that leadership preparation and practice vary widely across contexts, and that systems often lack robust evidence pipelines linking leadership development to improved practice and learner outcomes (UNESCO, 2024). This challenge is particularly relevant for local settings where capacity-building offerings may be available, yet systematic evaluation of their impact remains limited. In the Philippines, professional development is often implemented through division- and regional-level training initiatives. However, publicly accessible evaluation studies documenting pre–post competency gains or school-level performance effects are relatively uncommon—especially at the municipal level. As a result, school leaders may face a persistent implementation gap: they are expected to deliver standards-aligned leadership, but local evidence diagnosing their current practices and competence levels is often insufficient to guide targeted development interventions (DepEd, 2020).

Research in educational leadership provides strong theoretical and empirical grounds for examining leadership practices and managerial competence as interconnected constructs. Transformational leadership literature emphasizes the leader's capacity to build shared vision, motivate followers, and cultivate professional commitment, often associated with improved teacher engagement and organizational climate (Bass & Riggio, 2006; Leithwood, 2021). Instructional leadership research underscores the principal's direct focus on the core technology of schooling—teaching and learning—through curriculum supervision, monitoring learner outcomes, and supporting professional development (Hallinger & Wang, 2020). Distributed leadership perspectives argue that complex schools require leadership enacted through collaborative structures and shared responsibility, thereby strengthening collective efficacy and organizational learning (Harris, 2020; Spillane, 2006). Meanwhile, managerial competence literature highlights that effective leadership depends on the ability to operationalize plans, manage resources, monitor programs, and make timely decisions, reflecting Mintzberg's (1973) view of managerial work as an enacted set of interpersonal, informational, and decisional roles. Together, these traditions converge on a central proposition: leadership practices and managerial competence are mutually reinforcing—strong leadership without management risks becoming aspirational but ineffective, while strong management without leadership risks becoming bureaucratic and directionless (Leithwood, 2021).

This interaction between leadership and management is explicitly embedded in Philippine policy. The PPSSH integrates instructional leadership with operational and resource management, positioning school heads as both pedagogical leaders and accountable stewards of school governance (DepEd, 2020). In practice, this integration is increasingly critical because Philippine school heads operate in environments characterized by constrained resources, diverse learner needs, and rising expectations around equity, transparency, and learning recovery. Internationally, leadership's influence on learning is most consistently mediated through teacher capacity, instructional coherence, and organizational conditions (Day, 2020; Leithwood, 2021). For school heads, these mediating effects require managerial competence: strategic planning, sound financial stewardship, effective delegation, program evaluation, and timely problem-solving. The GEM Report further emphasizes that good leadership is evidence-informed, participatory, and oriented toward improving teaching and learning through purposeful system alignment (UNESCO, 2024). These expectations suggest that assessing school heads' leadership practices without examining managerial competence—or vice versa—would provide an incomplete account of school leadership effectiveness.

Despite the recognized importance of these constructs, empirical documentation remains uneven, particularly in smaller municipalities where leadership contexts differ from those in large urban systems. San Fabian, Pangasinan, provides an instructive case for this kind of diagnostic of localized leadership. As documented in the present study's context, San Fabian includes 34 public elementary and secondary schools led by school heads who must interpret and implement DepEd standards under the realities of municipal-level governance, resource constraints, and community partnership requirements. The study's rationale highlights that, while leadership and managerial competence are widely theorized as essential to school success, empirical evidence describing how these competencies manifest among San Fabian school heads is scarce, limiting local stakeholders' ability to design needs-based capacity-building interventions (Alvarez, n.d.).

In addition, the demographic and professional characteristics of school heads—such as years of service, educational attainment, and training exposure—may shape differences in how leadership and management are enacted. Leadership development research indicates that professional expertise accumulates over time through experience, mentoring, and sustained professional learning rather than solely through academic credentials (Day, 2020; Leithwood, 2021). In the Philippine context, competency standards such as the PPSSH are designed to support a developmental continuum, implying that novice and experienced school heads may require differentiated learning pathways to achieve exemplary practice (DepEd, 2020). Therefore, municipal-level studies that measure leadership practices and managerial competence and test how these vary across profile variables can generate evidence that is directly actionable, informing differentiated program design rather than generic training offerings.

Accordingly, this study positions leadership practices and managerial competence as two central variables essential for school improvement and policy alignment in San Fabian, Pangasinan. Conceptually, leadership practices refer to the observable behaviors and strategies through which school heads provide direction, support instruction, engage stakeholders, and cultivate professional culture, drawing on transformational, instructional, distributed, and situational approaches (Bass & Riggio, 2006; Hallinger & Wang, 2020; Harris, 2020; Spillane, 2006). Managerial competence refers to the ability to plan and implement school programs, manage resources, monitor performance, delegate responsibilities, and respond to emerging issues—competencies aligned with the PPSSH and consistent with managerial role perspectives (DepEd, 2020; Mintzberg, 1973). The study's focus on the relationship between these two constructs responds to both global and national calls for evidence-driven leadership development. UNESCO (2024) stresses that leadership reforms must be informed by diagnostic evidence, and DepEd (2020) frames standards as tools for professional reflection and targeted development.

The present research, therefore, aims to evaluate the leadership practices and managerial competence of school heads in San Fabian, Pangasinan, and determine whether these two constructs are significantly related. It further examines whether leadership and managerial measures vary across school heads grouped by selected demographic and professional profile variables. Ultimately, the study is designed as diagnostic-to-program research: its empirical findings serve as the basis for crafting a localized, standards-aligned capacity-building program responsive to the specific needs of San Fabian school heads. This approach is consistent with competency-based leadership development principles, which argue that development interventions are most effective when they are mapped to assessed competencies and tailored to identified gaps (Boyatzis, 1982; DepEd, 2020). Through this design, the study contributes to the municipal-level evidence base on school leadership in the Philippines while supporting DepEd's broader reform agenda of strengthening school leadership as a lever for educational quality and equity (DepEd, 2020; UNESCO, 2024).

2. Method

2.1 Research Design

This study employed a quantitative, non-experimental descriptive–correlational research design to determine the level of school heads' leadership practices and managerial competence and to examine the magnitude and direction of the relationship between these two constructs. A descriptive approach was used to summarize and characterize respondents' leadership practices and managerial competence using measures of central tendency and dispersion. The correlational component was utilized to test the association between leadership practices and managerial competence without manipulating variables or introducing controlled interventions, consistent with the intent of correlational designs to establish whether variables vary together in natural settings.

In addition, the study incorporated a comparative analytical element to determine whether leadership practices and managerial competence differed significantly across school heads grouped by selected profile variables (e.g., age, sex, educational attainment, and years of service). This design decision enabled the study to produce both baseline competence estimates and evidence of differentiated capacity-building needs, consistent with standards-based leadership development initiatives that emphasize diagnosis before intervention.

The design was aligned with the study's objective of generating empirical evidence for the development of a capacity-building program grounded in observed leadership and managerial performance patterns in the local school context. Because the study sought to measure existing conditions and relationships as they occur naturally, a descriptive–correlational framework was considered the most appropriate methodological approach.

2.2 Participants

The study participants were public school heads assigned to the Schools Division of Pangasinan II, specifically those serving in the municipality of San Fabian, Pangasinan. A total of 34 school heads participated in the study, representing the full complement of elementary and secondary school leaders in the locale at the time of data collection. Given the manageable population size and the intent to generate evidence that reflects the complete municipal leadership context, the study employed a total population sampling approach. This ensured that all eligible school heads were included and that the findings were not constrained by sampling error associated with partial representation.

Eligibility criteria included (a) currently designated as a school head (e.g., principal or officer-in-charge) in a public elementary or secondary school in San Fabian, and (b) actively serving during the conduct of the study. School heads who were on extended leave during the

data collection period or who did not provide consent were excluded; however, participation levels reflected full or near-full coverage of eligible respondents.

To facilitate descriptive and comparative analyses, participants were further characterized using selected demographic and professional profile variables, including age, sex, highest educational attainment, and years of service as a school head. These profile characteristics were used to examine potential differences in leadership practices and managerial competence across subgroups, thereby supporting the study's objective of generating evidence for targeted, needs-based capacity-building interventions.

2.3 Instrumentation

Data were gathered using a structured researcher-developed questionnaire designed to measure (a) the leadership practices of school heads and (b) their managerial competence, consistent with the competency expectations articulated in the Philippine Professional Standards for School Heads (PPSSH). The instrument was composed of two main parts. The first part elicited the respondents' demographic and professional profiles, including age, sex, highest educational attainment, and years of service as a school head. The second part contained the scale items used to assess the two principal study variables. Items on leadership practices were organized to capture leadership behaviors aligned with commonly recognized leadership dimensions in school settings.

In contrast, the managerial competence items focused on key administrative and operational functions, such as planning, organizing, coordinating, monitoring, and decision-making. Responses were recorded using a Likert-type rating scale, enabling the computation of weighted means to determine the extent to which school heads demonstrated specific leadership and managerial behaviors. Prior to full administration, the questionnaire underwent content validation by qualified experts in educational leadership and school management to ensure clarity, appropriateness, and alignment with the study objectives. Revisions were incorporated based on validator feedback, and the finalized instrument was then administered to the study participants for data collection.

2.4 Data Analysis

Data were coded, tabulated, and analyzed using standard quantitative procedures to address the study objectives. Descriptive statistics were computed to summarize the respondents' profile characteristics and to determine the level of leadership practices and managerial competence, including frequency counts, percentages, weighted means, and standard deviations. To examine the relationship between leadership practices and managerial competence, Pearson's product–moment correlation coefficient (r) was employed to determine the strength and direction of association between the two continuous composite measures. Differences in leadership practices and managerial competence across respondent subgroups were tested using inferential statistics appropriate to the nature of the grouping variables: an independent-samples t-test was used for comparisons involving two groups. In contrast, one-way analysis of variance (ANOVA) was used for variables with more than two categories. Where ANOVA results were significant, post hoc comparisons were conducted as necessary to identify specific group differences. All statistical tests were evaluated at a 0.05 level of significance, and results were interpreted in relation to the study's research questions and the standards-based leadership competencies embedded in the PPSSH framework.

3 Results

A total of 20 school heads participated in the survey-based assessment reported in the results section. The respondents were largely in the later stages of their professional careers. Specifically, 40% were aged 50 years and above, followed by 35% aged 40–49, and 25% aged

30–39. In terms of sex, 55% were male, and 45% were female. All respondents held postgraduate degrees: 60% held a master's degree , and 40% held a doctorate. Regarding leadership tenure, 35% reported 21 years or more of service as school head, while the remaining respondents were distributed across 16–20 years (20%), 6–10 years (20%), 11–15 years (15%), and 1–5 years (10%). Professional development exposure was relatively high, with 35% reporting participation in 10 or more trainings, while a smaller group (15%) reported participation in only 1–3 trainings, indicating uneven access to capacity-building opportunities.

Overall, school heads rated their leadership practices at a high level (overall mean = 4.29). The highest-rated leadership practice was effective management of resources (M = 4.45, Very High), followed by ensuring accountability and transparency (M = 4.40, Very High) and setting a clear school vision and direction (M = 4.35, Very High). School heads also reported very high performance in building partnerships with stakeholders (M = 4.30, Very High). Indicators rated comparatively lower—although still within the high range—were providing instructional support and feedback (M = 4.10, High) and promoting shared decision-making (M = 4.20, High).

School heads demonstrated a very high level of managerial competence (overall mean = 4.33, Very High). The top managerial competency was preparing clear and realistic school plans (M = 4.50, Very High), followed by demonstrating transparency in administrative tasks (M = 4.45, Very High) and implementing financial management effectively (M = 4.40, Very High). Ensuring a safe and supportive learning environment was also rated very high (M = 4.35, Very High). The lowest-rated managerial domains—though still high—were delegating tasks and responsibilities effectively (M = 4.15, High) and monitoring and evaluating school programs regularly(M = 4.20, High), suggesting areas where managerial routines could be further strengthened.

Pearson's product–moment correlation analysis indicated a strong and statistically significant positive relationship between leadership practices and managerial competence ($r = .752$, $p = .000$). This implies that school heads with higher leadership practice scores also tended to report higher managerial competence. In journal reporting, the probability value is more appropriately expressed as $p < .001$, indicating a statistically significant relationship at the 0.05 level.

Inferential tests indicated that leadership practices did not vary significantly across sex groups ($t = 1.245$, $p = .227$). Likewise, leadership practices showed no significant difference across educational attainment groups ($F = 2.315$, $p = .120$). In contrast, managerial competence differed significantly by years of service ($F = 3.842$, $p = .029$), indicating that longer-serving school heads generally demonstrated stronger managerial competence than their less-experienced counterparts.

4 Discussion

This study examined the leadership practices and managerial competence of school heads in San Fabian, Pangasinan, and tested whether these constructs are significantly associated. The findings provide empirical support for the proposition that leadership practice and managerial competence are mutually reinforcing capacities in school governance and improvement work. Overall, school heads reported high leadership practices (mean = 4.29) and very high managerial competence (mean = 4.33), suggesting that the participating school heads perceive themselves as consistently demonstrating standards-aligned leadership behaviors and strong administrative capability in their respective schools.

The results indicate that the strongest leadership indicators were those associated with resource management, accountability and transparency, and setting clear vision and direction. These patterns are consistent with contemporary leadership expectations embedded in standards-based models, such as the Philippine Professional Standards for School Heads (PPSSH), which require school heads to combine strategic leadership with school operations and

governance responsibilities. From an implementation perspective, the prominence of resource and accountability indicators may reflect the daily operational demands placed on school heads, particularly in public school systems, where compliance, reporting, and resource optimization are critical to sustained program delivery. School heads are frequently evaluated not only through instructional leadership outcomes but also through the integrity and efficiency of administrative processes. Thus, the high ratings in these domains suggest that the school heads' leadership may be strongly oriented toward governance, planning, and stakeholder accountability.

However, the comparatively lower (though still high) ratings for instructional support and feedback and shared decision-making warrant emphasis. While the overall leadership results are favorable, instructional leadership research suggests that consistent, systematic feedback and shared professional decision-making are among the most influential mechanisms through which leadership affects teaching quality and learning outcomes. In practice, instructional supervision and collaborative decision-making require time, technical expertise, and well-established professional learning routines—conditions that may be constrained when school heads face competing administrative burdens. The pattern observed here may therefore indicate a potential "leadership balance issue," in which school heads demonstrate strong managerial and governance leadership but have comparatively fewer opportunities to strengthen instructional coaching and collaborative structures.

Managerial competence was rated very high, with particularly strong performance in school planning, transparency in administrative tasks, and financial management. These findings suggest that respondents perceive themselves as capable of translating school priorities into operational plans and of managing school resources to support accountability and compliance. Such competencies are crucial in ensuring that school-level programs are implemented systematically and that reporting requirements are met, especially in public-sector contexts where schools operate under defined guidelines and audit expectations.

At the same time, the lowest-rated managerial indicators—delegation and regular monitoring and evaluation of programs—should be considered priority areas for capacity building. Delegation is both a managerial and leadership skill: it requires organizational trust, clarity of roles, and the establishment of systems that enable distributed work without compromising accountability. Similarly, program monitoring and evaluation require structured data routines and the capacity to translate monitoring outputs into managerial decisions. Where these elements are weaker, school improvement may become overly dependent on the school head's personal effort rather than on institutionalized systems. Strengthening delegation and monitoring practices can therefore improve sustainability by enabling distributed leadership and more consistent evidence-based adjustments to school programs.

A major contribution of the study is the identification of a strong, positive, and statistically significant relationship between leadership practices and managerial competence ($r = .752$, $p < .001$). This finding aligns with leadership–management integration perspectives in school administration, which argue that effective principals must not treat leadership and management as separate domains. Instead, leadership provides the strategic and cultural direction for improvement, while management provides the operational systems that ensure plans are implemented with fidelity. In practical terms, this result implies that strengthening leadership practices (e.g., vision-setting, stakeholder engagement, instructional support) is likely to correspond with improved managerial competence (e.g., planning, resource management, monitoring), and vice versa. The strength of the correlation also suggests that capacity-building interventions should be designed as integrated competency development rather than as isolated training modules (e.g., "leadership seminar" separate from "management workshop").

The results indicate that leadership practices did not differ significantly by sex ($p = .227$) or educational attainment ($p = .120$). This may suggest that the leadership expectations and professional role demands for school heads in the locale are relatively uniform across these

demographic categories. Additionally, because all respondents already held advanced degrees (master's or doctorate), educational attainment may not provide sufficient variability to produce measurable differences in leadership practice scores. In professional settings where minimum qualifications are already high, formal education may contribute less to between-group differences than practical experience, training exposure, and contextual factors.

By contrast, managerial competence differed significantly by years of service ($p = .029$). This result is theoretically plausible because many managerial competencies develop through repeated exposure to administrative cycles (planning, budgeting, implementation, reporting, audit preparation, and stakeholder negotiation). Longer-serving school heads may have developed stronger procedural knowledge, better institutional networks, and more refined strategies for managing competing demands. The implication for capacity-building is clear: professional development should be differentiated, with more structured managerial coaching and mentoring for less experienced school heads and more advanced leadership innovation programs for highly experienced leaders.

Taken together, the findings support a targeted capacity-building agenda for school heads in San Fabian. First, the overall high ratings indicate that foundational leadership and managerial competencies are strong; therefore, capacity-building should not be remedial in tone but should focus on deepening and sustaining effective practice. Second, the comparatively lower indicators suggest that professional development should prioritize (a) instructional support and feedback systems, (b) shared decision-making mechanisms, (c) effective delegation, and (d) monitoring and evaluation routines. These areas represent leverage points where improvements could enhance the school head's ability to translate strategic leadership into measurable instructional and program outcomes. Third, the strong relationship between leadership practices and managerial competence implies that capacity-building should integrate both constructs through applied learning designs—such as case-based problem-solving, coaching cycles, and performance-based action plans—rather than relying solely on lecture-based training.

Finally, the significant differences in managerial competence by years of service suggest that the proposed program should incorporate differentiated tracks (e.g., novice, mid-career, and veteran leaders) to address experience-based development needs. In doing so, the program can better operationalize standards such as the PPSSH by translating competency indicators into development pathways that are realistic, locally relevant, and measurable.

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FAITH IN MOTION: THE RELEVANCE OF RELIGIOUS FESTIVAL DANCES TO KAPAMPANGAN YOUTH

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Abstract

This study investigated the relevance of religious festival dances to Kapampangan youth in Pampanga, Philippines, focusing on their level of knowledge of historical and cultural relevance, positive perception and appreciation, engagement, and frequency of exposure. A quantitative, descriptive–comparative design was employed involving 200 Kapampangan youth aged 15–24 years from selected cities and municipalities in Pampanga. Data were gathered using a researcher-developed, expert-validated survey questionnaire with a five-point Likert scale. They were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and an independent-samples t-test at the 0.05 level of significance.

Findings indicated that respondents demonstrated a high level of knowledge regarding religious festival dances (overall M = 4.21, SD = 0.47) and a very high level of positive perception and appreciation (overall M = 4.33, SD = 0.39). Engagement among youth actively exposed through school programs was moderate (overall M = 3.87, SD = 0.58), while overall frequency of exposure to religious festival dances was also moderate (overall M = 3.76, SD = 0.64). The t-test results revealed a statistically significant difference in engagement between youth exposed to religious festival dances through school programs and those not exposed ($t = 3.41$, $p = 0.001$), indicating that structured educational exposure is associated with higher engagement. The results underscore the importance of institutional and community mechanisms for cultural transmission and suggest the need to strengthen school-based initiatives to sustain youth participation in religious festival dances. Proposed interventions include integrating festival dance modules in MAPEH, conducting inter-school cultural exhibitions, and implementing community-based cultural immersion programs.

Keywords: Kapampangan Youth; Religious Festival Dances; Cultural Heritage; Perception and Appreciation; Engagement; Exposure; MAPEH; Pampanga

1. Introduction

Religious festival dances in the Philippines constitute a form of living heritage where movement, music, and embodied ritual mediate collective memory, devotional practice, and local identity. Within many Filipino communities, dance is not merely performative; it is a culturally authorized mode of participation in public religiosity—an enactment through which community members communicate gratitude, petition, and belonging in the context of patronal feasts and liturgical calendars. UNESCO frames intangible cultural heritage (ICH) as practices, representations, expressions, knowledge, and skills that communities recognize as part of their cultural heritage, sustained through ongoing re-creation and transmission across generations (UNESCO, 2003). In this sense, religious festival dances are not static “folk artifacts,” but dynamic social practices whose relevance depends on whether younger generations continue to learn, value, and participate in them (UNESCO, n.d.-b).

The safeguarding and educational transmission of such practices is both a global and national priority. UNESCO has explicitly emphasized the role of formal and non-formal education in safeguarding ICH, noting that ICH can provide context-specific content and pedagogy that

strengthen the relevance and quality of education (UNESCO, n.d.-a). In the Philippine context, this orientation is reinforced by state commitments to culture and education: the 1987 Philippine Constitution directs the State to foster preservation and enrichment of national culture and to protect rights to cultural development (1987 Philippine Constitution, n.d.). Complementing this constitutional mandate, the National Cultural Heritage Act of 2009 (Republic Act No. 10066) provides a statutory framework for the protection and conservation of national cultural heritage, including intangible forms such as traditional practices and expressions (Republic Act No. 10066, 2009). Meanwhile, the Enhanced Basic Education Act of 2013 (Republic Act No. 10533) underscores curriculum principles of cultural sensitivity, contextualization, and localization, enabling schools to embed local heritage in learning experiences in ways that are responsive to community context (Republic Act No. 10533, 2013). These policy foundations legitimize treating religious festival dances not only as community traditions but also as educational resources that may support youth formation, identity development, and civic-cultural participation.

Notwithstanding these frameworks, the empirical problem is practical and immediate: the continuity of religious festival dances depends on youth knowledge, perception, and engagement. Globalization, shifting leisure ecologies, and changing patterns of religious participation can erode the everyday visibility of traditional practices unless deliberate community and school-based mechanisms support transmission. UNESCO's safeguarding guidance explicitly warns against "freezing" heritage; instead, heritage must remain relevant to communities and be continuously transmitted and recreated (UNESCO, n.d.-b). For religious festival dances, this raises a central educational and cultural question: what conditions make these dances meaningful and participation-worthy for contemporary youth?

Pampanga offers a salient site for investigating this question, given its rich repertoire of Kapampangan religious traditions and festival practices. Among these is the kuraldal of Sasmuan, a Catholic ritual dance associated with devotion to St. Lucy, illustrating how dance can function as both communal ritual and public testimony (e.g., narratives of ritual dance practice in Pampanga document kuraldal as a devotional performance embedded in local religious life) (see, for example, related anthropological treatment of kuraldal in Pampanga) (Flores, n.d.). Contemporary public accounts likewise underscore the continuing visibility of the Kuraldal Festival as an event where devotion and communal identity are enacted in mass participation (Gloton, 2025). However, visibility alone does not guarantee sustained youth engagement. Participation may be episodic, and knowledge of historical and symbolic meanings may vary depending on whether exposure is active (e.g., dance training, school performance, organizing roles) or passive (e.g., watching during festivals or via media).

The study is theoretically anchored in Social Identity Theory and Cultural Transmission Theory. Social Identity Theory posits that individuals derive aspects of self-concept from membership in social groups and that identification with an in-group shapes attitudes and behaviors toward group-associated practices (Tajfel & Turner, 1979). Applied to religious festival dances, youth who more strongly identify with the Kapampangan cultural community and faith-based communal life may exhibit more favorable perceptions and stronger behavioral engagement. Cultural Transmission Theory, in turn, provides a mechanism-focused explanation: cultural traits persist through transmission pathways—vertical (family), oblique (other adults, institutions), and horizontal (peers)—and these pathways can be strengthened or weakened by exposure opportunities and social learning contexts (Cavalli-Sforza & Feldman, 1981). Together, these theories motivate a measurable model in which knowledge and perception (cognitive and affective correlates of identity) and frequency/mode of exposure (transmission conditions) predict engagement (behavioral participation).

Empirically, prior Philippine-focused studies commonly indicate that festivals and dance practices can reinforce cultural identity and socio-cultural values and may carry educational value for youth development. For example, a recent study on the Panagsana Festival in Ilocos Norte

emphasizes socio-cultural and educational impacts of festival participation on youth, suggesting that festival dance contexts can function as informal education that cultivates belonging and community pride (Gonzales & Rabago, 2025). Related work examining festival dances as reflections of cultural identity (e.g., in the Panaad Festival context) similarly positions festival dance as an expressive medium through which local identity is recognized and reproduced (Villones, 2020). However, a persistent gap remains in studies that isolate religious festival dances—particularly in Kapampangan contexts—as distinct objects of quantitative inquiry focused on youth knowledge (historical/cultural relevance), positive perception/appreciation, exposure frequency, and engagement, and that compare engagement outcomes between youth with structured school-based exposure and those without.

Accordingly, the purpose of this study is to examine the relevance of religious festival dances to Kapampangan youth by quantitatively assessing (a) youths' knowledge of the historical and cultural relevance of local religious festival dances, (b) their positive perception and appreciation, (c) their engagement levels, and (d) their frequency and mode of exposure, including whether structured exposure through school programs corresponds to higher engagement. This focus aligns with standard scientific article expectations: the introduction should state the objectives and provide adequate background without becoming a full literature survey. By clarifying the extent to which youth knowledge, attitudes, and exposure are associated with engagement, the study seeks to generate evidence to inform school-based cultural programming and community safeguarding strategies consistent with national policy and UNESCO's education-oriented safeguarding approach (Republic Act No. 10533, 2013; UNESCO, n.d.-a). Ultimately, the study treats religious festival dances as both cultural heritage and a contemporary educational concern: a living practice whose continuity depends on whether Kapampangan youth experience it as meaningful, identity-relevant, and worth sustaining.

2. Method

2.1 Research Design

This study employed a quantitative, descriptive–comparative research design to examine the relevance of religious festival dances to Kapampangan youth in terms of their knowledge, perception, and appreciation, engagement, and exposure. The quantitative approach was selected to allow systematic measurement of variables, objective analysis of relationships, and statistical comparison between groups.

A descriptive design was used to determine the existing levels of knowledge, perception, and appreciation, engagement, and frequency of exposure of Kapampangan youth to religious festival dances. Descriptive statistics, including mean scores, standard deviations, frequencies, and percentages, were used to summarize respondents' characteristics and responses. This component of the design provided an empirical profile of how religious festival dances are currently understood and experienced by youth, without manipulating variables or introducing experimental conditions.

In addition, the study included a comparative component to determine whether there was a statistically significant difference in engagement levels between Kapampangan youth who were actively exposed to religious festival dances through school programs and those who were not. This non-experimental comparison was appropriate given the naturally occurring grouping of respondents based on educational exposure. An independent-samples comparison enabled the study to assess the role of formal educational exposure in determining youth engagement while maintaining ethical and practical feasibility.

The research design was grounded in the assumptions of Social Identity Theory and Cultural Transmission Theory, which posit that cultural knowledge, attitudes, and participation are shaped through exposure, social learning, and institutional mechanisms. These

theoretical foundations justified operationalizing variables into measurable constructs and supported the use of quantitative tools to test for differences and patterns. By translating abstract concepts such as cultural relevance, appreciation, and engagement into numerical indicators, the design ensured objectivity, replicability, and analytical rigor.

Data were collected at a single point in time using a structured survey questionnaire, making the study cross-sectional. This approach was appropriate for capturing prevailing perceptions and experiences of youth across different localities within Pampanga. The design did not attempt to establish causality; instead, it focused on identifying patterns, levels, and group differences that could inform educational and cultural interventions.

Overall, the quantitative descriptive–comparative design aligned with Elsevier's standards for empirical research reporting by ensuring methodological clarity, coherence between research questions and analytical techniques, and transparency in data treatment. The design enabled the study to generate evidence-based findings on the relevance of religious festival dances to Kapampangan youth, providing a sound foundation for educational recommendations and future research.

2.2 Participants

The participants of this study were Kapampangan youth aged 15–24 years residing in the Province of Pampanga, Philippines. A total of 200 respondents were included in the final sample, representing youth from selected localities in Pampanga, including San Fernando, Angeles City, Mabalacat, Guagua, Bacolor, and Mexico.

Participants were selected using a stratified random sampling approach to support representation across different municipalities/cities and educational backgrounds (e.g., public and private institutions). This sampling strategy was employed to reduce sampling bias and improve the generalizability of findings to the broader population of Kapampangan youth within the study locale.

Eligibility criteria were defined as follows: (i) age within the specified youth bracket (15–24 years), (ii) residence within Pampanga, and (iii) willingness to participate voluntarily. Data were collected through a structured survey questionnaire administered to respondents from identified schools and communities.

2.3 Instrumentation

Data were collected using a structured survey questionnaire developed by the researcher as the primary instrument for quantitatively assessing the relevance of religious festival dances to Kapampangan youth. The instrument was designed to assess respondents' knowledge, perceptions, appreciation, engagement, exposure, and perceived relevance of religious festival dances.

The questionnaire consisted of two main parts: (i) demographic items (e.g., age, sex, educational level, place of residence) and (ii) construct-based statements corresponding to the study variables. Items were rated using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to enable numerical aggregation and computation of descriptive and inferential statistics.

Prior studies and conceptual frameworks in cultural education, dance, and youth development informed the development of the instrument. To establish content validity, the questionnaire was reviewed by a panel of three experts with specialization in cultural studies, physical education, and research methodology; expert feedback was incorporated to improve item clarity, structure, and relevance to the intended constructs.

A pilot test was conducted with 20 Kapampangan youth from a school outside the study locale to evaluate clarity and reliability. Reliability was assessed using Cronbach's alpha, yielding a

coefficient above 0.80, indicating high internal consistency; subsequent revisions were implemented to refine item wording and improve comprehensibility.

2.4 Data Analysis

Descriptive statistics were employed to address the first set of research questions concerning the levels of knowledge, perception, and appreciation, engagement, and frequency of exposure of Kapampangan youth to religious festival dances. Specifically, frequency counts, percentages, means, and standard deviations were computed to summarize respondents' demographic characteristics and to describe central tendencies and variability of responses across the measured variables. Mean scores were interpreted using predefined verbal descriptors to provide a clear quantitative description of the youth's cultural knowledge, attitudes, and engagement levels.

To determine whether a statistically significant difference existed in the mean engagement scores of Kapampangan youth who were actively exposed to religious festival dances through school programs and those who were not exposed, an independent-samples t-test was applied. This inferential statistical test was appropriate given the comparison of two independent groups and the continuous nature of the engagement scores. The test was conducted at a 0.05 level of significance, which served as the criterion for rejecting or failing to reject the null hypothesis.

All statistical analyses were carried out using appropriate statistical software to ensure the accuracy and reliability of results. Findings were presented in tabular form, followed by a concise interpretation aligned with the research questions and theoretical framework. The use of both descriptive and inferential statistics ensured an objective, systematic, and replicable analysis of data, in accordance with Elsevier's standards for empirical research reporting.

3 Results

Results showed that Kapampangan youth demonstrated a high level of knowledge regarding the historical and cultural relevance of religious festival dances. The computed overall mean score was 4.21 (SD = 0.47), indicating that respondents were generally aware of the origins, historical background, and cultural meanings of these dances. All indicators under this variable yielded mean values within the "high" range, suggesting consistent cognitive awareness across the sample.

Findings further revealed a very high level of positive perception and appreciation of religious festival dances among Kapampangan youth. The overall mean score of 4.33 (SD = 0.39) reflected strong agreement with statements describing religious festival dances as expressions of faith, cultural identity, unity, and heritage preservation. These results indicate that respondents not only understood the cultural relevance of festival dances but also valued them effectively.

Regarding engagement, respondents who reported exposure to religious festival dances through school programs exhibited a moderate level of engagement, with an overall mean score of 3.87 (SD = 0.58). Indicators related to participation in performances, attendance at school festival activities, and involvement in organizing dance-related events all fell within the moderate range. This suggests that while exposure exists, sustained and active youth participation remains limited.

An independent-samples t-test was conducted to determine whether a significant difference existed between the engagement levels of youth who were actively exposed to religious festival dances through school programs and those who were not exposed. Results indicated a statistically significant difference in mean engagement scores ($t = 3.41$, $p = 0.001$). Youth who were exposed through school-based programs had a higher mean engagement score ($M = 3.98$, $SD = 0.54$) than non-exposed youth ($M = 3.52$, $SD = 0.62$). These findings led to the

rejection of the null hypothesis and suggest that formal educational exposure contributes significantly to higher engagement levels.

The analysis of exposure frequency revealed a moderate level of exposure to religious festival dances among Kapampangan youth, with an overall mean score of 3.76 (SD = 0.64). Exposure was most gained through community festivals, media platforms, and school or parish-based activities. Although multiple avenues of exposure were present, the moderate rating indicates that encounters with religious festival dances were occasional rather than frequent.

Overall, the results indicate that Kapampangan youth possess strong knowledge and positive attitudes toward religious festival dances, but their engagement and exposure levels are comparatively lower. The statistically significant difference between exposed and non-exposed groups underscores the role of school-based programs in enhancing youth engagement with religious festival dances.

4. Discussion

The finding that Kapampangan youth demonstrated a high level of knowledge about the historical and cultural relevance of religious festival dances suggests that cultural information about these practices continues to be effectively transmitted. This aligns with Cultural Transmission Theory, which posits that traditions persist when knowledge is systematically passed through formal and informal channels such as schools, families, and communities (Cavalli-Sforza & Feldman, 1981). Similar results have been reported in Philippine studies showing that youth exposed to local culture through education and community activities exhibit higher cultural awareness (Garcia, 2019; Lagman, 2021).

From an educational standpoint, this high level of knowledge supports UNESCO's assertion that integrating intangible cultural heritage into education strengthens learners' contextual understanding and cultural literacy (UNESCO, n.d.-a). In Pampanga, where religious festivals remain prominent, historical narratives and symbolic meanings embedded in dances such as the kuraldal appear to remain accessible to youth, even amid modernization. Knowledge, however, represents only the cognitive dimension of cultural relevance; its translation into sustained participation requires affective and behavioral reinforcement.

The very high level of positive perception and appreciation observed among respondents indicates that religious festival dances retain strong affective value for Kapampangan youth. This finding is consistent with Social Identity Theory, which argues that positive attitudes toward group-associated practices reflect identification with one's cultural and social group (Tajfel & Turner, 1979). When youth perceive festival dances as expressions of faith, unity, and cultural pride, these practices serve as symbols that reinforce collective identity.

Comparable findings have been documented in studies on Filipino youth and festival participation, where positive perceptions of cultural practices were linked to feelings of belonging and pride (Del Mundo, 2021; Villanueva, 2018). In the context of Pampanga, this appreciation suggests that religious festival dances continue to resonate as meaningful expressions of communal and spiritual life rather than being viewed as obsolete traditions. This affective attachment is critical for safeguarding intangible cultural heritage, as UNESCO emphasizes that heritage survives only when communities value it as relevant to their present lives (UNESCO, n.d.-b).

Despite high knowledge and appreciation, the study found only moderate levels of engagement among Kapampangan youth. This divergence highlights a common issue in cultural sustainability research: awareness and positive attitudes do not automatically translate into active participation. Similar patterns have been observed in studies where students expressed appreciation for traditional dances but participated only occasionally due to limited opportunities or competing academic and social demands (Tadeo, 2020; Hernandez, 2020).

This finding suggests structural and institutional constraints rather than cultural disinterest. Engagement requires accessible platforms for participation, rehearsal, and performance. Without sustained programs, youth involvement may remain episodic, occurring mainly during annual festivals. From a cultural transmission perspective, reduced frequency of participation weakens behavioral reinforcement, potentially affecting long-term continuity (Cavalli-Sforza & Feldman, 1981). Thus, moderate engagement should be interpreted not as cultural disengagement but as an indicator of insufficient institutional support mechanisms.

One of the most significant findings of the study was the statistically significant difference in engagement between youth exposed to religious festival dances through school programs and those who were not. This supports previous research demonstrating that structured educational exposure enhances participation in cultural practices (Santos, 2021; Bacani & De Leon, 2023). Schools serve as critical sites of cultural transmission by providing organized, repeated, and guided experiences that transform cultural knowledge into embodied practice.

This result aligns with the Enhanced Basic Education Act of 2013, which emphasizes contextualized and localized learning, allowing schools to integrate local heritage into curricula such as MAPEH (Republic Act No. 10533, 2013). It also reinforces UNESCO's recommendation that education systems play a central role in safeguarding intangible cultural heritage by embedding it in learning processes rather than treating it as extracurricular or peripheral (UNESCO, n.d.-a). The findings suggest that when religious festival dances are taught, practiced, or performed within formal school settings, youth are more likely to engage actively and meaningfully.

Taken together, the results indicate that religious festival dances remain culturally and symbolically relevant to Kapampangan youth but require stronger institutional integration to sustain active participation. High knowledge and appreciation provide a strong foundation, yet engagement depends on frequency and mode of exposure. This underscores the need for deliberate educational and community-based strategies that move beyond awareness toward practice.

The findings support policy and programmatic initiatives that integrate religious festival dances into school curricula, inter-school cultural activities, and community–school partnerships. Such initiatives are consistent with national cultural policies and international safeguarding frameworks that emphasize participation, education, and relevance as key conditions for the survival of intangible cultural heritage (Republic Act No. 10066, 2009; UNESCO, n.d.-b). Ultimately, sustaining religious festival dances among Kapampangan youth requires aligning cultural values with institutional support, ensuring that tradition remains a lived and practiced dimension of contemporary youth identity.

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IMPACT OF PHYSICAL EDUCATION TO TEACHERS' PRACTICES ON LEARNERS' PHYSICAL ACTIVITY

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Abstract

Physical Education (PE) plays a crucial role in promoting physical activity, health, and lifelong fitness behaviors among adolescents. This study examined the relationship between Physical Education teachers' instructional practices and junior high school learners' physical activity levels in selected public secondary schools in Aguilar District, Division of Pangasinan II. Employing a quantitative descriptive–correlational research design, the study involved 20 PE teachers and 80 junior high school learners selected through purposive sampling. Data were collected using a researcher-developed, validated questionnaire that measured teachers' practices and learners' physical activity levels, complemented by items that identified challenges encountered by teachers and proposed intervention measures.

Descriptive statistics were used to determine the extent of teachers' practices and learners' physical activity. At the same time, Pearson's product–moment correlation coefficient tested the relationship between the two variables at a 0.05 level of significance. Results revealed that PE teachers' practices were manifested to a very high extent, while learners' physical activity levels were high. A statistically significant and strong positive relationship was found between teachers' practices and learners' physical activity, indicating that effective instructional strategies, motivation techniques, and classroom management contribute substantially to increased learner engagement in physical activity. Despite these positive findings, teachers reported very high levels of challenge, particularly related to inadequate facilities, limited equipment, and insufficient time allocated to PE classes. Proposed intervention measures, including professional development and improved facilities, were strongly supported.

The study concludes that PE teachers' practices are a critical determinant of learners' physical activity. Strengthening institutional support and addressing structural challenges are essential to maximize the impact of Physical Education programs.

Keywords: Physical Education; Teacher Practices; Physical Activity; Junior High School; Descriptive–Correlational Study

1. Introduction

Physical Education (PE) is an essential component of basic education that contributes to learners' health, psychosocial development, and lifelong engagement in physical activity. In contemporary education systems, PE is mandated not merely to facilitate structured movement but to cultivate attitudes, skills, and behaviors that support an active and healthy lifestyle (Department of Education Philippines, n.d.). Despite its curricular importance, adolescent physical inactivity remains a pressing global concern, and schools are critical institutions for reversing sedentary behaviors through structured, meaningful PE experiences. Moreover, teacher practices within PE settings are widely recognized as a central influence on students' engagement, motivation, and actual participation in physical activity (Guo et al., 2025; De Cocker et al., 2025). This study examines how Physical Education teachers' instructional practices influence junior high school learners' physical activity levels, addressing an identified research gap in the Philippine context.

The role of PE teachers extends beyond mere delivery of physical tasks. Teachers shape the learning environment, pedagogical strategies, and motivational climate that influence students' participation and attitudes toward physical activity (Guo et al., 2025). In systematic reviews and empirical investigations, supportive teacher practices such as autonomy support, structured instruction, and positive feedback have been linked to higher student engagement and physical activity during PE lessons (Guo et al., 2025; De Cocker et al., 2025). Specifically, Self-Determination Theory (SDT) posits that when educators support students' psychological needs for autonomy, competence, and relatedness, learners demonstrate more sustained motivation and engagement with physical activities (De Cocker et al., 2025). Within this theoretical framework, teachers' instructional and motivational behaviours are predictive of both in-class engagement and the potential transfer of activity behaviours outside scheduled PE sessions.

Research also suggests that teacher support and pedagogical quality influence student outcomes across cognitive, affective, and behavioral domains. For example, teacher support in PE correlates with higher levels of behavioral and emotional engagement, which are essential for active participation and adherence to physical activity recommendations (Guo et al., 2025). Moreover, effective teaching practices are recognized as essential for translating curricular objectives into meaningful student outcomes, particularly in settings where PE faces resource constraints or low institutional prioritization (Department of Education Philippines, n.d.). These insights underscore the dual influence of domain-specific instructional quality and broader educational support structures in shaping learners' active behaviors.

In addition to pedagogical influences, student perceptions of teacher behavior and classroom climate are associated with affective responses to PE and subsequent activity levels. Filipino adolescents' attitudes toward PE, for instance, are influenced by teacher–student interactions, reinforcing the view that relational dynamics in PE settings can affect students' willingness to participate in physical activities (Cruz et al., 2021). When students perceive teacher support and positive interaction, they tend to exhibit more favorable attitudes, which may enhance both engagement and longer-term physical activity behaviors. This highlights the importance of teaching practices that extend beyond technical instruction and embed relational and motivational dimensions that encourage sustained participation.

Despite the documented importance of teacher practices, much of the existing literature focuses on teacher training at the pre-service level, teacher self-efficacy, or general pedagogical quality rather than direct empirical assessment of how specific instructional practices correlate with student physical activity levels within regular PE programs (Magallanes et al., 2024; Xiang et al., 2013). Moreover, few studies have been conducted in under-researched contexts, such as rural or resource-limited public school settings in Southeast Asia, where infrastructural and administrative barriers may further influence PE implementation and outcomes. This gap is notable because contextual factors such as facility availability, time allocation, and administrative support are known to moderate the effectiveness of teacher practices in promoting physical activity (Sabado et al., 2025). Without comprehensive evidence from diverse educational environments, stakeholders lack the empirical basis to tailor interventions or policy reforms that strengthen PE's contribution to active lifestyles.

To address these gaps, this study examines the relationship between PE teachers' instructional practices and learners' physical activity levels in junior high schools in the Aguilar District, Division of Pangasinan II, Philippines. A descriptive–correlational design was used to quantify teacher practices and student activity levels and to test the strength and direction of their association. By operationalizing teacher practices along dimensions such as instructional clarity, motivational support, task design, and classroom management, and by measuring learners' reported physical activity levels, the study aims to provide contextually grounded insights relevant to both educational practitioners and policymakers.

Furthermore, this investigation examines the challenges PE teachers face that may influence their instructional practices and, consequently, learners' physical activity outcomes. Prior research within the Philippine educational context has highlighted structural challenges such as limited facilities, equipment shortages, and restricted time allotment for PE, which can impede the translation of effective pedagogical intent into practice (Sabado et al., 2025; Department of Education Philippines, n.d.). Understanding the nature and extent of these challenges is integral to interpreting the efficacy of teacher practices and to proposing actionable interventions.

By establishing the nature of the relationship between teacher practices and learner physical activity, this study contributes to a growing body of evidence that situates teacher behavior as a key determinant of student engagement in physical activity. It also extends the empirical literature by providing localized data from the Philippine secondary education context, where questions about PE's role in promoting lifelong health behaviors remain underexplored. Given the global priority accorded to promoting physical activity among youth to mitigate the risks of non-communicable diseases and enhance overall well-being, insights from this study provide evidence to inform teacher training, curriculum enhancement, and institutional support mechanisms necessary to strengthen PE's impact.

In summary, this introduction has outlined (a) the conceptual significance of PE teacher practices in shaping student physical activity, (b) theoretical frameworks that contextualize teacher influence, (c) empirical evidence underscoring teacher–student relational dynamics, and (d) the gap in localized research addressing both pedagogical practices and contextual barriers. The ensuing sections detail the methodological framework, results, and implications of the study, which collectively deepen understanding of how PE instruction can effectively foster active lifestyles among junior high school learners.

2. Method

2.1 Research Design

This study employed a quantitative research design using the descriptive–correlational method to determine the relationship between Physical Education (PE) teachers' practices and junior high school learners' physical activity in Aguilar District. The quantitative approach was selected because it enables the collection of measurable, objective data suitable for statistical analysis. The descriptive component aimed to present an accurate account of (a) the prevailing PE teachers' practices and (b) learners' current level of physical activity. The correlational component tested whether a significant association exists between teachers' instructional practices and learners' physical activity engagement, without manipulating variables, thereby allowing interpretation of relationships as they naturally occur in the school setting.

Data were gathered through standardized survey questionnaires that generated quantifiable responses for the study's two major variables—teachers' practices and learners' physical activity. Teachers' practices were measured across key instructional dimensions (e.g., lesson planning, teaching strategies, motivation, assessment, and classroom management). At the same time, learners' physical activity was assessed in terms of participation indicators such as frequency, duration, and intensity across school and non-school contexts. A five-point Likert scale was used to ensure consistent quantification and suitability for statistical treatment.

Consistent with descriptive–correlational procedures, descriptive statistics (e.g., weighted mean and standard deviation) summarized the extent of teachers' practices and learners' physical activity, while inferential analysis using Pearson's product–moment correlation coefficient tested the strength and direction of the relationship between the two variables.

2.2 Participants

The study comprised of 100 respondents drawn from selected public secondary schools in Aguilar District, Division of Pangasinan II, during School Year 2025–2026: 20 Physical Education (PE) teachers and 80 junior high school learners. The respondents were selected using purposive sampling, focusing on individuals directly involved in the teaching and learning of PE within the participating schools. Teacher-respondents were those responsible for conducting PE classes, organizing school-based sports and fitness programs, and assessing learners' performance, while learner-respondents were those who regularly attended PE classes and were actively involved in physical activities within or outside the school setting.

Inclusion criteria required that: (1) teacher-respondents were currently teaching PE at the time of data collection (full-time or part-time PE instructors); (2) learner-respondents were officially enrolled as junior high school students in the selected public schools within Aguilar District and actively participating in PE classes; and (3) all participants voluntarily agreed to take part through informed consent procedures.

Exclusion criteria included: (1) teachers assigned only to other MAPEH components (e.g., Music, Arts, Health) and not handling PE classes; (2) learners who were medically excused, physically incapacitated, or exempted from participating in PE classes; and (3) respondents who failed to complete or return the questionnaire. Participants were informed of their right to withdraw at any time without penalty, and incomplete responses were excluded from final analysis to preserve data reliability and consistency.

2.3 Instrumentation

The primary research instrument used in this study was a structured survey questionnaire developed by the researcher based on related literature, prior studies, and theoretical frameworks on teaching practices and physical activity in Physical Education. The questionnaire was designed to generate quantitative data describing the two major variables of the study: (a) Physical Education teachers' practices and (b) learners' physical activity levels. To ensure objectivity and standardization, items were written in clear, measurable terms and rated using a five-point Likert scale to support statistical analysis.

The questionnaire consisted of three parts: (1) respondents' demographic profile (e.g., age, sex, grade level for learners, and years of teaching experience for teachers); (2) items measuring teachers' practices, including instructional strategies, motivational techniques, classroom management, and evaluation methods; and (3) items measuring learners' physical activity level, operationalized through indicators of frequency, intensity, and duration of participation in physical activities during PE and in extracurricular settings.

Prior to final administration, the instrument underwent content validation and reliability testing. A panel of experts (physical education professors, research specialists, and measurement experts) reviewed the questionnaire for clarity, relevance, and alignment with the study's objectives, and revisions were implemented based on their feedback. A pilot test was subsequently conducted with 30 junior high school learners and 5 PE teachers from a non-participating school within the same division. Reliability analysis using Cronbach's alpha yielded a coefficient of 0.89, indicating high internal consistency and supporting the instrument's suitability for the main study.

2.4 Data Analysis

Data collected from the completed questionnaires were coded, tabulated, and analyzed quantitatively using appropriate statistical techniques to address the objectives of the study. Prior to analysis, all responses were screened for completeness and accuracy. Questionnaires with missing or inconsistent entries were excluded to ensure data integrity and reliability.

Descriptive statistics were employed to summarize respondents' characteristics and to determine the extent of Physical Education (PE) teachers' practices and learners' physical activity levels. Specifically, the weighted mean was used to describe the degree to which teacher practices were manifested and the level of learners' physical activity. In contrast, standard deviation was used to assess the variability of responses. Mean scores were interpreted using predefined descriptive ranges corresponding to the five-point Likert scale.

To determine the relationship between PE teachers' practices and learners' physical activity, Pearson's product–moment correlation coefficient (r) was applied. This inferential statistical test was selected because the variables were continuous and normally distributed, and the study sought to measure the strength and direction of their linear relationship. The level of significance was set at $\alpha = 0.05$, and the null hypothesis was rejected when the computed *p*-value was less than the established significance level.

All statistical analyses were conducted using a standard statistical software package appropriate for educational research. Results were presented in tables and interpreted in relation to the study objectives, with emphasis on statistical significance and practical implications within the context of Physical Education instruction.

3 Results

The study revealed that Physical Education (PE) teachers' practices were rated to a very high extent, with a composite mean of 4.32. High ratings were observed across instructional dimensions, particularly in the use of varied teaching strategies, provision of clear instructions, and application of motivational techniques that encouraged learner participation. Teachers consistently reported integrating structured activities aligned with lesson objectives and providing constructive feedback to enhance learners' performance and engagement. These findings indicate that PE teachers in the selected schools demonstrated strong adherence to effective pedagogical practices in delivering PE instruction.

Learners' physical activity level was rated high, with a composite mean of 4.02. Results showed that learners actively participated in PE classes and school-based physical activities, including exercises, games, and sports. Higher mean scores were noted for participation during scheduled PE classes, while slightly lower—but still favorable—ratings were recorded for engagement in physical activities outside regular class hours. Overall, the findings suggest that learners maintained an active level of physical engagement, particularly within the structured school environment.

Correlation analysis using Pearson's product–moment correlation coefficient revealed a statistically significant positive relationship between PE teachers' practices and learners' physical activity ($r = 0.76$, $p < 0.05$). This result indicates a strong association: higher levels of effective teaching practices corresponded with higher levels of learner physical activity. Consequently, the null hypothesis stating that there is no significant relationship between teachers' practices and learners' physical activity was rejected.

The challenges encountered by PE teachers in promoting learners' physical activity were rated to a very high extent, with a composite mean of 4.30. The most frequently reported challenges included inadequate sports facilities and equipment, limited time allocation for PE classes, large class sizes, and competing academic demands. These constraints were perceived as limiting the range of activities teachers could implement and reducing opportunities for sustained learner engagement in moderate-to-vigorous physical activity.

Proposed intervention measures to enhance PE implementation and learners' physical activity were rated very high, with a composite mean of 4.50. Priority interventions included regular in-service training and professional development for PE teachers, provision and improvement of sports facilities and equipment, and the organization of school-wide physical activity and sports programs. The strong level of agreement indicates broad support among

respondents for institutional and administrative actions to strengthen PE delivery and address identified challenges.

Overall, the results demonstrate that effective PE teachers' practices are strongly associated with higher learner physical activity levels, despite substantial structural and resource-related challenges.

4. Discussion

The results showed that PE teachers' practices were manifested to a very high extent. This indicates that teachers consistently applied effective instructional strategies, motivational techniques, and classroom management practices in PE classes. These findings align with prior studies that emphasize that high-quality PE instruction—characterized by clear objectives, varied activities, and positive feedback—enhances student engagement and participation (Guo et al., 2025). Teacher support, particularly through encouragement and structured guidance, has been shown to foster students' sense of competence and enjoyment, which are critical determinants of sustained physical activity (De Cocker et al., 2025).

From a theoretical standpoint, these findings are consistent with Self-Determination Theory, which posits that teaching practices that support autonomy, competence, and relatedness promote intrinsic motivation and engagement (Ryan & Deci, 2020). When PE teachers provide clear instructions, adapt activities to learners' abilities, and create a supportive learning climate, students are more likely to participate actively and persist in physical activity. Similar conclusions were drawn by Cruz et al. (2021), who reported that Filipino students' positive attitudes toward PE were strongly influenced by teacher behavior and instructional quality.

Learners' physical activity levels were high, particularly during scheduled PE classes. This suggests that the school environment, through structured PE lessons, plays a vital role in ensuring that adolescents meet recommended levels of physical activity. This finding supports global evidence that schools are among the most effective settings for promoting physical activity among young people, especially in contexts where opportunities for recreational activity outside school may be limited (World Health Organization, 2022).

However, slightly lower activity levels outside formal PE periods suggest that while teacher-led instruction effectively promotes in-class activity, translating these behaviors into leisure-time physical activity remains a challenge. Previous studies have similarly noted that PE participation does not automatically result in sustained physical activity beyond school unless learners develop strong motivation and self-regulation skills (Guo et al., 2025). This underscores the importance of PE programs that not only emphasize skill development but also explicitly encourage active lifestyles beyond the classroom.

One of the most significant findings of the study was the strong positive relationship between PE teachers' practices and learners' physical activity. This result confirms that higher-quality teaching practices are associated with higher levels of learner participation in physical activity. The strength of the correlation ($r = 0.76$) indicates that teacher practices are a major contributing factor to learners' activity behavior.

This finding corroborates the results of Guo et al. (2025), who demonstrated that teacher support in PE significantly predicts student behavioral engagement.

Similarly, De Cocker et al. (2025) emphasized that PE teachers play a pivotal role in motivating students to engage in both in-school and out-of-school physical activity through instructional design and motivational climate.

These findings also align with Social Cognitive Theory, which highlights the role of environmental factors and social modeling in shaping behavior (Bandura, 1986). Teachers serve as role models whose enthusiasm, competence, and commitment can influence learners' beliefs about physical activity and their perceived ability to participate. When teachers consistently

demonstrate positive practices, learners are more likely to internalize the value of physical activity and engage more actively.

Despite high levels of teacher practice, the study revealed that PE teachers experienced very high levels of challenge, particularly inadequate facilities and equipment, limited instructional time, and large class sizes. These findings are consistent with research in the Philippine context, which has repeatedly identified structural and resource-related constraints as major barriers to the implementation of quality PE (Sabado et al., 2025).

Such constraints may limit teachers' ability to implement diverse and engaging activities, potentially reducing opportunities for moderate-to-vigorous physical activity. Even highly competent teachers may struggle to achieve optimal outcomes when institutional support is insufficient. This reinforces the argument that improving PE outcomes requires not only effective teachers but also supportive policies, adequate resources, and appropriate time allocation within the school curriculum (Department of Education Philippines, n.d.).

The very high level of agreement on proposed intervention measures reflects respondents' shared recognition that systemic support is necessary to sustain and enhance PE effectiveness. Interventions such as regular professional development, facility improvement, and expanded school-wide physical activity programs are consistent with international recommendations for strengthening PE systems (World Health Organization, 2022). These interventions address both teacher capacity and structural barriers, thereby creating conditions that allow effective teaching practices to translate more fully into improved learner physical activity.

Overall, the discussion highlights that while PE teachers in the study context demonstrate strong instructional practices, their impact is mediated by broader institutional conditions. The strong relationship between teacher practices and learner physical activity underscores the critical role of teachers, while the identified challenges emphasize the need for coordinated administrative and policy-level support. Together, these findings contribute to the growing body of evidence that effective PE requires an integrated approach that combines high-quality teaching, adequate resources, and supportive school environments.

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COMMUNITY-BASED SUPPORT MODEL FOR STRENGTHENING THE FEEDING OUTREACH PROGRAM OF URBIZTONDO INTEGRATED SCHOOL

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Abstract

School feeding programs are widely recognized as effective interventions for addressing malnutrition and supporting learner participation; however, their long-term success depends on consistent implementation, stakeholder engagement, and sustainable community support. This action research study developed a community-based support model to strengthen the Feeding Outreach Program of Urbiztondo Integrated School. Specifically, the study assessed the program's implementation status, identified challenges encountered, and determined stakeholder needs as inputs for designing an institutionalized support framework. A descriptive–evaluative approach was employed, using a structured survey questionnaire, stakeholder consultations, and document review to gather quantitative and qualitative data from key school and community stakeholders. Quantitative findings indicated that the feeding program was generally functional in planning, implementation, and monitoring, reflecting established internal school procedures. However, stakeholder participation and sustainability were rated lower, suggesting that program continuity was vulnerable to limitations in external support. The significant challenges identified included limited funds, delayed or insufficient food supplies, inadequate facilities, and inconsistent volunteer participation, which collectively disrupted feeding schedules and increased workload among implementers. Stakeholders emphasized the need for a stable food supply, organized community involvement, improved facilities, and stronger coordination mechanisms. Based on these findings, a community-based support model was developed to formalize stakeholder roles, enhance resource mobilization, strengthen monitoring and evaluation systems, and promote shared responsibility for program sustainability. The study concludes that strengthening feeding outreach programs requires not only effective school implementation but also structured community partnerships to ensure continuity and sustained learner support.

Keywords: School Feeding Program; Community-Based Support Model; Stakeholder Participation; Program Sustainability; Action Research; Nutrition Intervention

1. Introduction

Malnutrition among school-age children remains a persistent public health and education challenge, particularly in low- and middle-income countries where food insecurity, poverty, and unequal access to nutritious diets intersect with learning outcomes. Nutritional deprivation during childhood has been linked to impaired cognitive development, reduced attention span, poorer academic performance, and diminished long-term educational attainment (Georgieff, 2022; Smith et al., 2022). These developmental impacts are not limited to early childhood; evidence indicates that nutritional deficits that persist into the primary school years can adversely affect IQ, classroom behavior, and school achievement, thereby undermining investments in education systems and human capital development (Smith et al., 2022). In this context, school-based health and nutrition programs, particularly school feeding interventions, are increasingly recognized as a strategic mechanism not only for improving child nutrition but also for strengthening equitable access to learning.

Globally, school feeding programs have become one of the most widely implemented social protection measures supporting children's well-being. The World Food Programme (WFP) notes that school meals now reach hundreds of millions of learners worldwide, reflecting major government commitments to tackle malnutrition, improve attendance, and promote educational participation (World Food Programme, 2024). Recent global reporting indicates that 466 million children are receiving school meals through government-led programs, representing a significant increase since 2020; however, large disparities remain, particularly in low-income settings where program coverage is often limited, and sustainability constraints are more pronounced (World Food Programme, 2024). These programs are regarded as "high-return" interventions, producing benefits across health, education, and local economic development—especially when they incorporate locally sourced food supply chains and community participation (World Food Programme, 2024). Parallel global education-health literature underscores that school health and nutrition programs are among the most feasible and cost-effective ways to support learners' development, resilience, and school participation, particularly for vulnerable populations (United Nations Children's Fund [UNICEF], 2023).

At the same time, malnutrition increasingly presents as a double burden, with undernutrition, micronutrient deficiencies, overweight, and obesity coexisting within and across communities. This phenomenon reflects complex food environments and inequitable access to healthy diets. In global monitoring, the UNICEF–WHO–World Bank Joint Child Malnutrition Estimates emphasize that child malnutrition patterns remain uneven and persistent across countries, underscoring the need for integrated, context-sensitive nutrition strategies (World Health Organization, 2025). UNICEF's recent global nutrition report highlights that food environments are increasingly failing children, contributing to inadequate nutrient intake and rising diet-related health risks (UNICEF, 2025). Such trends underscore the importance of nutrition policies that safeguard children's dietary quality, including school-based interventions that ensure reliable access to safe, balanced meals during the school day.

In the Philippines, malnutrition continues to affect a substantial portion of learners, particularly those in public elementary schools where poverty and household food insecurity remain prevalent. In response, the Department of Education (DepEd) has implemented the School-Based Feeding Program (SBFP) as a national intervention to address undernutrition among learners and improve educational participation. The SBFP is framed not merely as a feeding initiative but as a program intended to improve classroom attendance and school performance while enhancing the nutritional status of target beneficiaries (Department of Education [DepEd], 2018). DepEd's supplemental guidelines emphasize that the SBFP aims to increase classroom attendance, encourage consistent school participation, and support measurable improvements in learner health indicators (DepEd, 2018). In principle, this establishes SBFP as a multi-sectoral education-health initiative aligned with global evidence suggesting that nutrition inputs can influence learning outcomes and engagement.

However, despite the sound rationale and national-level policy infrastructure supporting SBFP, implementation challenges persist at the local level. These challenges often include resource limitations, logistical issues related to food procurement and preparation, variability in stakeholder participation, and constraints in sustaining operations over time. School feeding programs, particularly those operating at the community level, require coordinated participation from school personnel, parents, local government units, and community partners to maintain program continuity. Where such support systems are weak or fragmented, feeding programs may be unable to achieve intended outcomes or may become dependent on inconsistent funding streams. Global literature emphasizes that expanding the reach of school meals is insufficient unless programs are also strengthened through governance, accountability, community ownership, and consistent financing (World Food Programme, 2024). Thus, the sustainability of

school feeding programs is increasingly understood as a structural issue that depends on local partnerships and multi-stakeholder systems rather than solely on food provision.

UNICEF further underscores that school-based nutrition programs are most impactful when integrated into broader school health strategies and supported through consistent implementation, monitoring, and stakeholder engagement (UNICEF, 2023). In many developing contexts, feeding interventions are often vulnerable to operational gaps because they rely heavily on school-level execution without sufficient institutional support structures. Moreover, recent research suggests that while feeding programs can improve nutrition-related outcomes, evidence of consistent impact on broader health and well-being varies across contexts, highlighting the need for localized program strengthening and outcome evaluation (Hallett et al., 2025). This underscores the need for local studies to understand implementation constraints, viable stakeholder support systems, and models that can strengthen feeding outreach programs in specific school settings.

In school communities with high nutrition vulnerability, strengthening feeding programs requires moving beyond compliance-based implementation toward deliberate, context-specific support mechanisms. One promising approach is the development of community-based support models that formalize stakeholder roles, define partnerships, and institutionalize resource contributions. Such models may include structured involvement of parent groups, local officials, barangay health workers, private partners, and civil society, supported by clear monitoring and feedback systems. This aligns with the broader global direction of positioning school meals as an investment in child development and local food systems rather than as a short-term welfare intervention (World Food Programme, 2024). It also reflects the policy and governance principle that schools operate as community hubs, capable of mobilizing collective resources for learner welfare.

The urgency of developing sustainable support mechanisms is reinforced by evidence linking malnutrition to long-term neurodevelopmental consequences. Contemporary research indicates that nutritional deprivation is associated with measurable neurodevelopmental effects, potentially shaping cognitive and behavioral outcomes that influence educational trajectories (Georgieff, 2022). Although causality is complex and mediated by socioeconomic factors, the persistence of these associations emphasizes that school feeding programs should be viewed as protective and developmental interventions, particularly for children in disadvantaged settings (Smith et al., 2022). Therefore, strengthening feeding outreach programs is not only a matter of program management but a response to a persistent educational equity issue.

In this regard, action-oriented research is valuable because it supports the development and refinement of local solutions grounded in stakeholder experiences and contextual realities. Community-based models can be systematically assessed for feasibility, acceptability, and relevance to implementation challenges. In line with this perspective, this study focuses on developing a community-based support model to strengthen the Feeding Outreach Program of Urbiztondo Integrated School. By examining program status, stakeholder needs, and implementation constraints, the study contributes to a more actionable understanding of how school feeding programs can be reinforced through localized governance and participation mechanisms.

Accordingly, the study is anchored on the premise that feeding outreach programs are more likely to succeed when communities share ownership and responsibility for implementation. This reflects both national priorities of improving learner health and international evidence that effective school meals require systems-level support and sustained stakeholder engagement (DepEd, 2018; UNICEF, 2023; World Food Programme, 2024). The proposed output—a community-based support model—seeks to provide a structured framework for strengthening collaboration, mobilizing resources, and improving the sustainability and responsiveness of school feeding initiatives.

2. Method

2.1 Research Design

This study employed an action research design with a descriptive–evaluative orientation to develop and propose a community-based support model intended to strengthen the Feeding Outreach Program of Urbiztondo Integrated School. The action research approach was selected because it is appropriate for school-based contexts where the objective is not only to describe existing conditions but also to generate a practical improvement framework grounded in stakeholder realities. Action research is characterized by a systematic, reflective inquiry process that involves identifying a problem, collaboratively gathering data, analyzing constraints and needs, and formulating an actionable response or intervention. In the present study, this design supported the development of a localized support model by anchoring recommendations in quantitative and qualitative evidence from program implementers and key stakeholders.

The research design followed a problem–analysis–solution framework, consistent with the methodological logic of action research. First, the study documented the existing status and implementation conditions of the Feeding Outreach Program, including operational practices and perceived effectiveness. Second, it assessed the challenges encountered in program implementation, particularly those relating to sustainability, stakeholder engagement, and resource constraints. Third, it identified stakeholder needs and potential mechanisms for strengthening collaboration and support systems. The findings from these phases were synthesized to inform the development of a proposed community-based support model.

The design's descriptive component enabled the study to systematically capture stakeholders' perceptions of the program's status and effectiveness. In contrast, the evaluative component enabled analysis of implementation gaps, areas for improvement, and contextual factors affecting program outcomes. Quantitative data were generated through structured survey instruments, while qualitative insights were gathered through stakeholder consultation processes and document-based review of program-related records. This mixed-evidence approach enhanced the explanatory power of the findings and ensured that the proposed model reflected both measurable patterns and contextual realities of implementation.

Overall, the adopted research design was aligned with the study's purpose of strengthening the Feeding Outreach Program through the development of a community-based support framework. By integrating stakeholder perspectives, documenting implementation challenges, and translating findings into a structured support model, the action research design produced evidence-informed, context-responsive outputs suitable for program improvement at the school and community levels.

2.2 Participants

The participants in this study were key stakeholders directly involved in or supporting the implementation and sustainability of the Feeding Outreach Program at Urbiztondo Integrated School. Participant selection was guided by the study's action research orientation, which requires the inclusion of individuals who possess relevant experiential knowledge of the program's operations, challenges, and support needs. Accordingly, the study engaged participants representing both the internal school implementation team and the external community support system.

The study included school personnel, specifically those assigned to manage and implement the feeding program at the school level, as well as individuals with administrative and operational responsibilities related to learner welfare initiatives. These school-based participants were selected because they were expected to provide detailed insights into program planning, daily implementation processes, learner participation, resource utilization, and operational constraints encountered during program execution.

In addition, the study involved parents and community representatives, including individuals who contribute to or are expected to contribute to feeding program support through volunteer work, resource mobilization, or participation in school-community collaboration activities. These participants were included because feeding outreach initiatives depend heavily on community cooperation, particularly in meal preparation, beneficiary monitoring, and the provision of supplemental resources. Their perspectives were essential to identifying feasibility issues, barriers to sustained participation, and the types of support mechanisms most acceptable in the local context.

Moreover, the study incorporated input from other stakeholders who influence program sustainability, including representatives from local government units, barangay officials, and community partners, where applicable. These stakeholders were considered relevant because local institutions often play an important role in maintaining the continuity of school-based programs through policy endorsement, logistical support, and the mobilization of community resources.

Participants were identified using a purposive sampling approach, ensuring that respondents had direct involvement or substantive knowledge relevant to the feeding outreach program. When the total number of eligible stakeholders was manageable, total enumeration was used to capture the perspectives of all individuals in specific participant groups. This sampling strategy supported comprehensive stakeholder representation and strengthened the validity of the study's findings, particularly in informing the development of a community-based support model grounded in stakeholder needs and program realities.

All participants were informed of the study's objectives, and their participation was voluntary. Ethical procedures, including confidentiality and informed consent, were observed throughout the data collection process to protect participants and ensure the responsible use of their responses.

2.3 Instrumentation

This study used three complementary instruments to generate quantitative and qualitative evidence to assess the Feeding Outreach Program and inform the development of a community-based support model. The primary instrument was a structured survey questionnaire designed to capture stakeholder perceptions regarding the program's implementation status, effectiveness, sustainability, encountered challenges, and identified support needs. The questionnaire employed a Likert-type rating scale and was organized into sections aligned with the study's objectives, allowing the data to be summarized using descriptive statistics, including frequency distributions, weighted means, and rankings.

To enrich and validate the survey results, the study used a semi-structured interview and a stakeholder consultation guide. This qualitative instrument enabled the researcher to obtain deeper explanations of implementation realities, barriers to sustained participation, and feasible strategies for strengthening stakeholder collaboration. The interview and consultation process supported the study's action research orientation by facilitating reflective input from participants and generating thematic insights that guided the formulation of the proposed support model.

In addition, a document and program record review checklist was used to systematically examine relevant school-based records and program documentation, including implementation reports, beneficiary lists, and monitoring records. This record-based evidence served as a triangulation mechanism to corroborate stakeholder responses and identify operational patterns not fully captured through perception-based instruments. Content validation of the survey instrument was conducted through expert review, and triangulation across survey, interview, and document-based sources was applied to strengthen the credibility and rigor of the study's findings.

2.4 Data Analysis

Quantitative data from the structured survey questionnaire were analyzed using descriptive statistics to summarize stakeholder assessments of the Feeding Outreach Program. Responses to the Likert-type scale items were tabulated and analyzed using frequency counts, percentages, and weighted means, allowing the study to determine the overall status of program implementation and the extent to which participants perceived challenges and support needs. Items were further ranked based on computed weighted means to identify the most salient implementation constraints and priority areas requiring support.

Qualitative data obtained from semi-structured interviews, stakeholder consultations, and document review were analyzed using thematic analysis. Participant responses were organized, coded, and grouped into emerging themes aligned with the study objectives, particularly those relating to sustainability barriers, stakeholder participation issues, and feasible support strategies. Findings from the qualitative analysis were used to contextualize and triangulate quantitative results, thereby strengthening interpretive validity and providing an evidence-based foundation for the proposed community-based support model.

3. Results

Baseline findings showed that the Feeding Outreach Program of Urbiztondo Integrated School was generally functioning well, particularly in planning and implementation. In planning, most respondents described the program as organized and prepared: 65% of responses fell under *Very High* and *High* combined, suggesting that schedules, goals, and preparation activities were clearly communicated to implementers and stakeholders. Implementation also received favorable ratings, with 55% rated as *Very High* or *High*, indicating that feeding activities were typically carried out as intended and aligned with routine school operations. Monitoring and evaluation practices were likewise present and functional, with 50% of responses in the top categories, indicating that tracking systems existed, though not consistently strong across all feeding cycles. Overall, these findings suggest that the program's operational backbone—planning, delivering meals, and keeping some form of monitoring—was already established and working, providing a solid foundation for program strengthening.

However, the same results showed that the program became less stable when the focus shifted from school-led operations to community-linked components. Stakeholder participation was rated lower and more uneven, with only 45% of responses in *Very High* and *High*, while 25% fell under *Low* and *Very Low*. This pattern reflects that while some parents and community members were consistently supportive, others were less involved or participated only occasionally—making participation unreliable across feeding cycles. The weakest area was sustainability, with only 40% rated *Very High* or *High*, and a notable 30% rated *Low* or *Very Low*. These figures highlight a key reality: even when a school can plan and implement well internally, feeding outreach becomes fragile when resources, volunteer support, and long-term continuity depend on unstable external participation. This baseline gap directly justified the need for a structured community-based support model to stabilize involvement and ensure resource continuity.

Respondents consistently identified a set of challenges that explained why stakeholder participation and sustainability were weaker. The most frequently observed difficulties included limited funds, inconsistent or delayed food supplies, and low volunteer turnout, which often resulted in disruptions in feeding schedules or increased burden on teachers and implementers. Challenges also included inadequate feeding materials or facilities, weak monitoring routines, and irregular feeding schedules, all of which affected the continuity and quality of program delivery. What stood out in the responses was that these challenges were not isolated problems—they were interconnected. For example, when food supplies were delayed or incomplete, feeding days became irregular; when volunteers were unavailable, teachers carried

an additional workload; and when workload increased, monitoring and documentation tended to weaken. This overall pattern shows that the sustainability of feeding outreach was limited not by the program's intent, but by operational constraints that required broader support systems beyond the school alone.

When stakeholders were asked what the program needed most, their responses were clear and practical: they wanted the feeding outreach to be more stable, better supported, and easier to sustain. The most frequently mentioned need across all stakeholder groups was a stable and adequate food supply (35 total mentions), indicating that consistent delivery of ingredients and complete feeding cycles were the foremost priority. Stakeholders emphasized that when supplies arrive late or are incomplete, learners do not receive continuous support, and the purpose of feeding is weakened. The next two strongest needs were increased community and parent volunteer support (31 mentions) and better feeding facilities and materials (25 mentions). This indicates that stakeholders recognized that even if food is available, feeding cannot run smoothly without enough workforce and functional facilities such as utensils, storage space, and clean feeding areas. In short, stakeholders were not asking for more complicated systems—they were asking for the basics to become dependable: food that arrives on time, volunteers who can be organized, and facilities that allow the program to run safely and efficiently.

After the Community-Based Support Model was developed and applied, the post-implementation evaluation indicated visible improvements in previously weak areas. Results showed that feeding cycles became more consistent, stakeholder involvement improved through clearer systems of participation, monitoring routines became more regular, and sustainability practices strengthened through organized support mechanisms. The model's structured systems—focused on stabilizing supplies, organizing volunteers, improving facilities, strengthening coordination through a support team, and institutionalizing monitoring and feedback—helped reduce the program's dependence on informal, fluctuating support. Importantly, the findings reinforced that the Feeding Outreach Program's long-term effectiveness depended not only on school effort but on a shared-responsibility partnership with community stakeholders and that institutionalizing the model was necessary to sustain gains across future feeding cycles.

4. Discussion

The results of this study show that the Feeding Outreach Program at Urbiztondo Integrated School is operationally established and capable of being implemented within the school setting, especially in planning and delivery. Respondents generally rated program planning and implementation as high, suggesting that the school has already developed routine systems for scheduling activities, preparing meals, and organizing the basic flow of feeding operations. This aligns with broader evidence that school feeding programs can be effectively implemented when schools have clear operational structures and administrative commitment (UNICEF, 2023). In practice, once the internal school system is functioning, the primary challenge tends to shift from "how to feed" to "how to sustain feeding over time," particularly when the program requires consistent resources and collaboration beyond the school workforce. This explains why the study recorded weaker outcomes in stakeholder participation and sustainability—two components that depend heavily on external support and long-term resource continuity rather than internal planning alone.

A key contribution of the findings is the clear pattern that sustainability was the most fragile aspect of implementation, and that sustainability issues were strongly linked to resource limitations and constraints on stakeholder involvement. Respondents identified limited funds, delayed or insufficient supplies, and inconsistent volunteer support as persistent barriers. These results mirror national-level observations that the Philippine School-Based Feeding Program (SBFP) operates under dynamic funding conditions and often relies on partnerships to sustain

implementation capacity (U.S. Department of Agriculture Foreign Agricultural Service [USDA FAS], 2023). DepEd operational guidelines further emphasize that implementation requires coordination, transparency, and stakeholder participation—implying that sustainability is not only a resource issue but also a governance and partnership issue (Department of Education [DepEd], 2021). The current study's results support this policy framing: when stakeholder participation is inconsistent, the burden of implementation falls back to teachers and program implementers, increasing workload and weakening monitoring routines. In other words, the feeding outreach program becomes technically functional but structurally vulnerable because it lacks the stable community support and consistent resourcing needed to sustain it across cycles.

The stakeholder needs assessment provides practical guidance for strengthening the program: stakeholders primarily seek stability in the program's basic inputs—food supply, workforce support, and functional facilities. The most strongly expressed need was a stable, adequate supply of ingredients, followed by organized parent/community volunteer support and improvements to feeding facilities and materials. This is consistent with global findings that the effectiveness of school feeding is highly dependent on predictable supply chains and enabling infrastructure for food preparation, safety, and delivery (World Food Programme [WFP], 2024). UNICEF's global report on school health and nutrition similarly highlights that school feeding programs yield strong benefits when they are embedded in robust implementation systems and supported by sustained stakeholder engagement (UNICEF, 2023). These findings suggest that strengthening feeding outreach at the local level does not necessarily require entirely new interventions; rather, it requires stabilizing the program's operational backbone through structured support and shared responsibility mechanisms.

Notably, the study's post-implementation observations indicate that the Community-Based Support Model improved the weaker areas identified during baseline assessment, particularly stakeholder participation and program sustainability. While the school could already implement the feeding outreach program internally, the model appears to have improved continuity by defining stakeholder roles, clarifying participation mechanisms, and strengthening monitoring and coordination systems. This outcome reflects the widely recognized principle that school meals become more sustainable when they shift from being "school-owned" to "community-owned," supported through formalized partnerships and shared accountability structures (WFP, 2024). Such findings are especially relevant in contexts where resources are limited and program implementers cannot sustain additional workload indefinitely. The model's impact suggests that sustainability can be strengthened when participation is not treated as voluntary goodwill alone but is built into structured collaboration agreements, clear systems of contribution, and routine monitoring processes.

Finally, the findings reinforce the broader developmental importance of sustained feeding outreach. Research consistently shows that childhood malnutrition is associated with cognitive delays, reduced academic achievement, and behavioral difficulties that can affect educational trajectories (Smith et al., 2022). Although school feeding programs are not a universal solution to malnutrition, they are recognized globally as strategic investments that support child development, learning participation, and longer-term human capital outcomes (UNICEF, 2023; WFP, 2024). The present study adds local evidence supporting this broader claim: even when a school feeding program is functioning, its long-term effectiveness depends on how well it is supported, sustained, and reinforced by community systems. The proposed Community-Based Support Model offers a feasible, context-specific approach to addressing the sustainability gap by formalizing stakeholder participation, stabilizing resources, and strengthening program monitoring. In doing so, it contributes to the operational strengthening of SBFP-aligned initiatives and provides a replicable framework that other schools facing similar sustainability constraints may adapt.

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ENHANCING STUDENT ENGAGEMENT THROUGH GAME-BASED ACTIVITIES IN FACE-TO-FACE PHYSICAL EDUCATION CLASSES

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Abstract

Learner engagement is a critical factor in the effectiveness of Physical Education (PE) instruction, particularly in face-to-face settings where sustaining students' interest and participation remains a persistent challenge. This study examined the effects of game-based activities on learner engagement, enjoyment, and participation in face-to-face PE classes. Using a quantitative, descriptive–comparative research design, data were collected from 250 junior high school students enrolled at a public secondary school during the 2024–2025 academic year. A researcher-developed, validated questionnaire measured learner engagement across three dimensions—active participation, attentiveness, and enthusiasm—as well as self-reported enjoyment and participation levels under game-based and non-game-based instructional conditions. Descriptive statistics were used to determine mean engagement and enjoyment levels, while inferential statistics (t-tests and ANOVA) were applied to identify significant differences between instructional approaches.

Results indicated that learners exposed to game-based activities demonstrated very high levels of overall engagement, with active participation obtaining the highest mean score, followed by attentiveness and enthusiasm. Self-reported enjoyment was also rated very high in game-based PE classes. Comparative analyses revealed statistically significant differences in both enjoyment and participation levels, favoring game-based activities over non-game-based approaches. These findings suggest that integrating structured game elements into face-to-face PE instruction enhances not only learners' affective responses but also their behavioral involvement.

Grounded in Self-Determination Theory, the study highlights the pedagogical value of game-based learning in supporting autonomy, competence, and relatedness among learners. The results provide empirical evidence that game-based activities are an effective instructional strategy for improving engagement, enjoyment, and participation in traditional physical education contexts.

Keywords: Game-Based Learning; Physical Education; Learner Engagement; Student Enjoyment; Participation; Gamification

1. Introduction

Learner engagement has long been recognized as a critical determinant of educational success across disciplines, including Physical Education (PE). Engagement encompasses learners' behavioral involvement, emotional investment, and cognitive focus during learning activities, all of which are essential for meaningful participation and sustained motivation. In the context of PE, where learning is inherently experiential and activity-based, student engagement is particularly important because it directly influences participation levels, skill acquisition, and long-term attitudes toward physical activity. However, traditional PE instruction, which often relies on repetitive drills and teacher-centered approaches, has frequently been criticized for failing to sustain students' interest and motivation, especially among adolescents (Bayne & Wooldridge, 2019).

In response to declining engagement and enjoyment in PE classes, educators and researchers have increasingly explored innovative instructional strategies that emphasize active, learner-centered participation. One such approach is game-based learning and gamification, which integrates structured game elements—such as rules, challenges, feedback, cooperation, and competition—into instructional activities. Game-based approaches are grounded in the premise that play and challenge naturally stimulate curiosity, enjoyment, and persistence, thereby fostering deeper engagement in learning tasks. Within PE, game-based activities are particularly well-suited because they align with the subject's physical, social, and affective objectives, offering learners opportunities to move, interact, and collaborate in meaningful ways (Arufe-Giráldez et al., 2022).

Empirical research has consistently demonstrated the positive effects of game-based and gamified instruction on learner outcomes in PE. Systematic reviews have shown that gamification enhances motivation, enjoyment, and engagement across various educational levels and cultural contexts (Camacho-Sánchez et al., 2023; El-Tanahi et al., 2024). For instance, studies conducted in European, Asian, and Middle Eastern contexts have reported that students exposed to game-based PE interventions exhibit higher levels of intrinsic motivation, perceived competence, and enjoyment compared to those taught using traditional methods (Ahmed & Rana, 2021; Vorontsova & Popova, 2022). These findings suggest that game-based strategies can play a crucial role in addressing persistent engagement challenges in PE classrooms.

Beyond enjoyment and motivation, participation is another core outcome in physical education that has been positively associated with game-based learning. Active participation not only reflects learners' behavioral engagement but also determines the extent to which they benefit physically, socially, and cognitively from PE lessons. Research indicates that gamified PE environments encourage students to participate more consistently and with greater intensity by reducing the fear of failure, increasing perceived competence, and fostering a supportive social climate (Buil et al., 2020; Seaborn & Fels, 2015). Cooperative and competitive game formats, in particular, have been shown to promote inclusion by engaging students of varying skill levels and encouraging teamwork and peer support (Silva & Moreira, 2021).

The theoretical foundation for the effectiveness of game-based learning in PE is well explained by Self-Determination Theory (SDT), which posits that learner motivation and engagement are enhanced when the psychological needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 1985). Game-based activities inherently support these needs by allowing learners to make choices (autonomy), experience mastery through achievable challenges (competence), and interact socially with peers (relatedness). When these needs are met, learners are more likely to exhibit higher levels of engagement, enjoyment, and sustained participation. Numerous studies have applied SDT in PE research and found that game-based instruction significantly improves motivational and engagement-related outcomes (Adeloju & Temesgen, 2023; Kuo & Chang, 2020).

Despite the growing body of literature supporting game-based learning in PE, several important gaps remain. First, much of the existing research has focused predominantly on affective outcomes such as enjoyment and motivation, often treating engagement as a single, undifferentiated construct. There is limited empirical work that disaggregates engagement into specific, measurable dimensions such as active participation, attentiveness, and enthusiasm. Understanding these distinct components is essential because each represents a different aspect of how learners interact with PE activities. Second, many studies have relied heavily on self-reported measures, with insufficient attention to participation levels or behavioral indicators of engagement, limiting the ability to link positive perceptions directly to observable learning behaviors.

Another notable gap concerns instructional context. A significant portion of recent research on game-based learning has been conducted in digitally mediated, blended, or

technology-enhanced environments. While these studies provide valuable insights, they do not fully address the realities of face-to-face PE classes, particularly in resource-constrained or non-digital settings. Physical education in many schools continues to be delivered in traditional gymnasium or outdoor environments, where non-digital, physical games are more practical and accessible. There remains a need for empirical evidence that examines how game-based physical activities—without reliance on digital platforms—affect learner engagement and participation in fully face-to-face PE classes (Mbabazi & Ahimbisibwe, 2021).

Furthermore, although comparative studies have demonstrated that gamified instruction often outperforms traditional approaches, fewer studies have quantitatively examined the magnitude of differences in enjoyment and participation between game-based and non-game-based PE activities. Establishing statistically significant differences in these outcomes is essential for providing evidence-based justification for instructional change. In addition, while several scholars have advocated integrating gamification into PE curricula, there is a relative lack of empirically grounded pedagogical guidelines and game design principles derived directly from measured engagement outcomes (Kapp, 2012; Domínguez et al., 2013).

Given these gaps, the present study examined learner engagement through game-based activities in face-to-face physical education classes, with a particular focus on distinct engagement dimensions—active participation, attentiveness, and enthusiasm—as well as self-reported enjoyment and participation levels. Using a quantitative, descriptive-comparative design, the study aimed to determine whether statistically significant differences exist between game-based and non-game-based PE activities in terms of enjoyment and participation. Anchored in Self-Determination Theory, the study also aimed to translate empirical findings into practical pedagogical guidelines and game design principles that PE teachers can apply in traditional classroom and gym-based settings.

Through this investigation, the study contributes to the growing literature on game-based learning in physical education by providing fine-grained, quantitative evidence on engagement dimensions and participation outcomes in a fully face-to-face context. The findings are expected to inform both theory and practice by strengthening the empirical basis for gamified PE instruction and offering actionable insights for educators seeking to enhance learner engagement, enjoyment, and participation in physical education classes. Learner engagement has long been recognized as a critical determinant of educational success across disciplines, including Physical Education (PE). Engagement encompasses learners' behavioral involvement, emotional investment, and cognitive focus during learning activities, all of which are essential for meaningful participation and sustained motivation. In the context of PE, where learning is inherently experiential and activity-based, student engagement is particularly important because it directly influences participation levels, skill acquisition, and long-term attitudes toward physical activity. However, traditional PE instruction, which often relies on repetitive drills and teacher-centered approaches, has frequently been criticized for failing to sustain students' interest and motivation, especially among adolescents (Bayne & Wooldridge, 2019).

In response to declining engagement and enjoyment in PE classes, educators and researchers have increasingly explored innovative instructional strategies that emphasize active, learner-centered participation. One such approach is game-based learning and gamification, which integrates structured game elements—such as rules, challenges, feedback, cooperation, and competition—into instructional activities. Game-based approaches are grounded in the premise that play and challenge naturally stimulate curiosity, enjoyment, and persistence, thereby fostering deeper engagement in learning tasks. Within PE, game-based activities are particularly well-suited because they align with the subject's physical, social, and affective objectives, offering learners opportunities to move, interact, and collaborate in meaningful ways (Arufe-Giráldez et al., 2022).

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The theoretical foundation for the effectiveness of game-based learning in PE is well explained by Self-Determination Theory (SDT), which posits that learner motivation and engagement are enhanced when the psychological needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 1985). Game-based activities inherently support these needs by allowing learners to make choices (autonomy), experience mastery through achievable challenges (competence), and interact socially with peers (relatedness). When these needs are met, learners are more likely to exhibit higher levels of engagement, enjoyment, and sustained participation. Numerous studies have applied SDT in PE research and found that game-based instruction significantly improves motivational and engagement-related outcomes (Adeloju & Temesgen, 2023; Kuo & Chang, 2020).

Despite the growing body of literature supporting game-based learning in PE, several important gaps remain. First, much of the existing research has focused predominantly on affective outcomes such as enjoyment and motivation, often treating engagement as a single, undifferentiated construct. There is limited empirical work that disaggregates engagement into specific, measurable dimensions such as active participation, attentiveness, and enthusiasm. Understanding these distinct components is essential because each represents a different aspect of how learners interact with PE activities. Second, many studies have relied heavily on self-reported measures, with insufficient attention to participation levels or behavioral indicators of engagement, limiting the ability to link positive perceptions directly to observable learning behaviors.

Another notable gap concerns instructional context. A significant portion of recent research on game-based learning has been conducted in digitally mediated, blended, or technology-enhanced environments. While these studies provide valuable insights, they do not fully address the realities of face-to-face PE classes, particularly in resource-constrained or non-digital settings. Physical education in many schools continues to be delivered in traditional gymnasium or outdoor environments, where non-digital, physical games are more practical and accessible. There remains a need for empirical evidence that examines how game-based physical activities—without reliance on digital platforms—affect learner engagement and participation in fully face-to-face PE classes (Mbabazi & Ahimbisibwe, 2021).

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Through this investigation, the study contributes to the growing literature on game-based learning in physical education by providing fine-grained, quantitative evidence on engagement dimensions and participation outcomes in a fully face-to-face context. The findings are expected to inform both theory and practice by strengthening the empirical basis for gamified PE instruction and offering actionable insights for educators seeking to enhance learner engagement, enjoyment, and participation in physical education classes.

2. Method

2.1 Research Design

This study employed a quantitative, descriptive–comparative research design to examine differences in learner engagement, enjoyment, and participation between game-based and non-game-based activities implemented in face-to-face Physical Education (PE) classes. The design was appropriate because the primary objectives required (a) estimating the central tendency of key engagement indicators (active participation, attentiveness, and enthusiasm) under game-based instruction and (b) testing whether statistically significant differences existed in self-reported enjoyment and participation between the two instructional conditions.

The descriptive component quantified learners' responses using structured Likert-type scales to generate mean scores for each engagement dimension and an overall index. The comparative component evaluated differences between conditions by applying inferential statistical procedures (e.g., independent-samples *t*-tests and/or analysis of variance [ANOVA], depending on the analytic plan for each outcome), with statistical significance evaluated at an a priori alpha level (typically $\alpha = .05$).

2.2 Participants

The study was 250 junior high school students enrolled at Pangasinan National High School, Pangasinan, during School Year 2024–2025. The study site was selected because it provided an established, authentic face-to-face Physical Education (PE) setting in which both game-based and non-game-based PE activities could be implemented and compared.

Participants were selected using stratified random sampling to ensure proportional representation across grade levels and sections within the junior high school population. Students who were officially enrolled and actively participating in scheduled face-to-face PE classes during the data-collection period were considered eligible for inclusion. Demographic characteristics were verified through school records to support accurate profiling of the respondent group and to ensure alignment between the sampling frame and the final sample.

2.3 Instrumentation

Data were collected using a researcher-made, structured survey questionnaire designed to quantify learner engagement, enjoyment, and participation in face-to-face Physical Education (PE) classes under game-based and non-game-based activity conditions. The instrument comprised closed-ended, Likert-type items organized to align with the study variables and research questions.

The questionnaire included item sets measuring learner engagement across three dimensions—active participation, attentiveness, and enthusiasm—as well as items assessing self-reported enjoyment and participation levels when game-based mechanics (e.g., competition/cooperation and structured challenges) were present. All statements were rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) to generate numerical scores suitable for descriptive and inferential statistical analyses.

Before administration, the questionnaire underwent content validation by a panel of experts with backgrounds in physical education, educational psychology, and research methodology to ensure item clarity, relevance, and alignment with the constructs being measured. The instrument was subsequently pilot-tested using a small group of students from a comparable public high school not included in the main study to evaluate reliability and improve item performance. Internal consistency was assessed using Cronbach's alpha, and the resulting coefficient supported the instrument's reliability for the intended measures.

2.4 Data Analysis

Data were processed and analyzed using descriptive and inferential statistical techniques aligned with the study's descriptive–comparative objectives. Completed questionnaires were checked for completeness, coded, and encoded into a dataset for statistical treatment.

Descriptive statistics were used to summarize respondents' ratings for each study variable. Specifically, means (and, where applicable, measures of variability such as standard deviations) were computed to describe learner engagement in terms of active participation, attentiveness, and enthusiasm, as well as overall engagement and self-reported enjoyment and participation levels. Mean scores were interpreted using the study's predefined scale descriptors (e.g., very low to very high).

To test comparative research questions, inferential analyses were conducted to determine whether statistically significant differences existed between game-based and non-game-based conditions. Specifically, t-tests and analysis of variance (ANOVA) were applied as appropriate to evaluate differences in mean enjoyment and participation outcomes across instructional approaches. Statistical significance was evaluated using a conventional alpha threshold (typically $p < .05$), and results were reported with the corresponding test statistics and p-values to support the conclusions.

3 Results

Learner engagement in face-to-face PE classes utilizing game-based activities was assessed across three dimensions: active participation, attentiveness, and enthusiasm. Descriptive analysis showed that students demonstrated a very high level of engagement during game-based activities.

Active participation yielded the highest mean score ($M = 4.35$), indicating that learners frequently and consistently participated in PE activities under game-based conditions. Attentiveness also registered a very high mean score ($M = 4.28$), suggesting that learners were able to sustain focus and follow instructions during game-based PE lessons. Enthusiasm yielded a high mean score ($M = 4.20$), reflecting learners' positive energy and eagerness to engage in

activities. The computed overall engagement mean across the three dimensions was 4.28, which falls within the very high descriptive range.

Learners' self-reported enjoyment levels in PE classes that utilized game-based activities were analyzed using descriptive statistics. Results indicated a very high level of enjoyment, with a mean score of $M = 4.30$. This finding suggests that students perceived game-based PE activities as enjoyable and engaging during face-to-face instruction.

Inferential analysis was conducted to determine whether there was a statistically significant difference in learners' enjoyment levels between game-based and non-game-based PE activities. Results showed that the mean enjoyment score for game-based activities ($M = 4.30$) was higher than that for non-game-based activities ($M = 3.15$). The computed mean difference was 1.15, and the test results indicated that this difference was statistically significant at the .05 level.

Learners' participation levels under the two instructional approaches were also compared. Descriptive results revealed that participation was very high in game-based activities ($M = 4.32$), whereas participation in non-game-based activities was moderate ($M = 3.25$). The observed mean difference between the two conditions was 1.07.

Further inferential testing confirmed that the difference in participation levels between game-based and non-game-based activities was statistically significant ($p < .05$), indicating that learners participated more actively when PE activities were structured using game-based approaches.

Overall, the results demonstrated that learners exhibited very high engagement, very high enjoyment, and higher participation levels during game-based PE activities compared with non-game-based activities. Statistically significant differences were found for both enjoyment and participation outcomes, favoring the game-based instructional approach.

4. Discussion

The present study examined learner engagement, enjoyment, and participation in face-to-face Physical Education (PE) classes through the use of game-based activities, with results indicating consistently positive outcomes across all measured dimensions. Overall, learners exposed to game-based instruction demonstrated very high levels of engagement, enjoyment, and participation, and showed statistically significant differences compared with non-game-based instructional approaches. These findings provide empirical support for the effectiveness of game-based learning as a pedagogical strategy in traditional, non-digital PE contexts.

Regarding learner engagement, the results revealed that active participation, attentiveness, and enthusiasm were all rated at high to very high levels under game-based conditions. Active participation emerged as the strongest engagement dimension, suggesting that learners were more willing to join, sustain involvement, and exert effort when PE activities were structured as games. This finding aligns with prior research indicating that game-based and gamified instruction encourages behavioral engagement by reducing passivity and increasing opportunities for meaningful involvement (Buil et al., 2020). Similarly, attentiveness was rated very high, indicating that learners maintained focus during game-based activities. This supports earlier studies showing that games capture learners' attention through clear goals, immediate feedback, and challenge-based structures that sustain concentration (Huang & Hew, 2018).

Enthusiasm, although slightly lower than participation and attentiveness, was still rated high, reflecting learners' positive emotional responses and energy during game-based PE lessons. This finding is consistent with the work of Vorontsova and Popova (2022), who reported that students in game-based PE programs expressed greater excitement and positive attitudes toward physical activities than those in traditional classes. Together, these results suggest that game-based instruction effectively addresses multiple dimensions of engagement, supporting the

view that engagement in PE is a multidimensional construct encompassing behavioral, cognitive, and emotional components.

The very high level of self-reported enjoyment observed in this study further reinforces the motivational value of game-based activities. Enjoyment is a critical affective outcome in PE because it influences learners' willingness to participate and their long-term attitudes toward physical activity. The finding that learners experienced significantly greater enjoyment during game-based activities is consistent with systematic reviews indicating that gamification enhances enjoyment and positive emotional experiences across educational settings (Camacho-Sánchez et al., 2023). Similar results were reported by Ahmed and Rana (2021), who found that students in gamified PE lessons reported higher satisfaction and interest compared with those in traditional instructional formats.

The statistically significant difference in enjoyment levels between game-based and non-game-based activities highlights the comparative advantage of gamified instruction in PE. Learners not only perceived game-based activities as more enjoyable but also reported moderate enjoyment under non-game-based conditions, suggesting that traditional approaches may be less effective in sustaining affective engagement. This finding aligns with Domínguez et al. (2013), who argued that gamified learning environments enhance students' emotional involvement by transforming learning tasks into rewarding experiences. In the context of PE, where enjoyment is closely tied to participation and motivation, these results underscore the importance of instructional designs that prioritize fun and challenge alongside skill development.

Participation levels also differed significantly between instructional approaches, with learners participating more actively in game-based activities than in non-game-based ones. This finding supports previous evidence that gamification increases behavioral engagement by encouraging consistent involvement and reducing disengagement (Seaborn & Fels, 2015). The higher participation observed in this study may be attributed to the games' inclusive and motivating nature, which allows learners of varying skill levels to contribute meaningfully. Cooperative and competitive elements embedded in game-based activities likely fostered a supportive social environment that encouraged learners to remain involved throughout the lesson, consistent with Silva and Moreira's (2021) findings.

From a theoretical perspective, the results strongly support Self-Determination Theory (SDT) as an explanatory framework for understanding the observed outcomes. According to SDT, motivation and engagement are enhanced when learners' needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 1985). Game-based activities inherently support autonomy by offering choices and meaningful roles, competence by providing achievable challenges and feedback, and relatedness through social interaction and teamwork. The very high engagement and enjoyment levels observed in this study mirror findings from other SDT-based PE research demonstrating that game-based instruction fosters intrinsic motivation and sustained participation (Adeloju & Temesgen, 2023).

Beyond theoretical contributions, the findings have important pedagogical implications. The results suggest that PE teachers can enhance learner engagement and participation by integrating structured game mechanics such as points, challenges, and progressive difficulty into face-to-face instruction. This is consistent with Kapp's (2012) assertion that effective gamification balances enjoyment with instructional purpose, ensuring that learning objectives remain central. The proposed pedagogical guidelines derived from this study provide empirically grounded strategies that teachers can apply in traditional PE settings without reliance on digital technologies.

Despite its contributions, the study should be interpreted in light of certain limitations. The use of self-reported measures may introduce response bias, and the focus on a single school context may limit generalizability. Future research may extend these findings by incorporating observational measures of engagement, examining long-term effects of game-based PE

interventions, and exploring variations across age groups or cultural contexts. Nevertheless, the present study adds to the growing body of evidence demonstrating that game-based activities are an effective means of enhancing engagement, enjoyment, and participation in face-to-face physical education classes.

In summary, the discussion of findings confirms that game-based learning is not merely an engaging alternative to traditional PE instruction but a pedagogically sound approach supported by theory and empirical evidence. By fostering higher levels of engagement, enjoyment, and participation, game-based activities offer a practical pathway for improving the quality and effectiveness of physical education in face-to-face learning environments.

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EFFECTS OF TRADITIONAL VS GAMIFIED INSTRUCTION ON STUDENT LEARNING AND MOTIVATION IN MAPEH

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Abstract

This study examined the effects of traditional instruction and gamified instruction on students' academic performance and motivation in Music, Arts, Physical Education, and Health (MAPEH). Grounded in Self-Determination Theory, the research investigated whether integrating game design elements into classroom instruction could enhance learners' motivation and learning outcomes compared to conventional teacher-centered approaches. A quantitative, quasi-experimental design was employed involving two non-equivalent groups of high school learners. One group received traditional MAPEH instruction, while the other received gamified instructional strategies that incorporated points, challenges, feedback, and rewards aligned with curricular objectives.

Data were collected using a standardized MAPEH achievement test to measure academic performance and a validated motivation questionnaire assessing autonomy, competence, and relatedness. Independent-samples t-tests were conducted to determine significant differences between instructional groups. Results indicated that learners exposed to gamified instruction achieved significantly higher academic performance and reported significantly higher motivation levels than those who received traditional instruction. In addition, descriptive analyses of learner and teacher perception surveys revealed generally positive attitudes toward gamified instruction, highlighting increased engagement, enjoyment, and perceived instructional effectiveness.

The findings suggest that gamified instruction can serve as an effective pedagogical approach for enhancing both cognitive and motivational outcomes in MAPEH education. By supporting learners' psychological needs and promoting active engagement, gamification offers a viable alternative to traditional instructional methods. The study contributes empirical evidence to the growing literature on educational gamification. It provides practical implications for educators and curriculum developers seeking to implement learner-centered instructional strategies in interdisciplinary subjects.

Keywords: Gamified Instruction; Traditional Instruction; Academic Performance; Motivation; MAPEH; Self-Determination Theory

1. Introduction

Contemporary education systems are increasingly challenged to address declining student engagement and motivation, particularly in subjects that demand the simultaneous development of cognitive, affective, and psychomotor competencies. Music, Arts, Physical Education, and Health (MAPEH) is one such interdisciplinary domain where traditional, teacher-centered instructional approaches have often struggled to sustain learners' interest and active participation. Conventional pedagogies in MAPEH frequently emphasize direct instruction, repetition, and standardized assessment, which may be insufficient to meet the motivational needs of modern learners and may limit opportunities for experiential, collaborative, and self-directed learning. As a result, educators and researchers have increasingly explored innovative instructional strategies to enhance motivation, engagement, and academic performance in this multifaceted subject area.

Among these strategies, gamification—the integration of game design elements such as points, challenges, feedback, rewards, and narratives into non-game learning contexts—has gained considerable attention in educational research. Gamification seeks to transform learning experiences by fostering enjoyment, sustained engagement, and a sense of accomplishment, while maintaining alignment with curricular objectives. Empirical studies conducted over the past decade have reported positive effects of gamified instruction on student motivation, engagement, and academic outcomes across various disciplines and educational levels (Dichev & Dicheva, 2022; Li et al., 2023). In physical education and related fields, gamified approaches have been shown to promote active participation, collaborative learning, and persistence, thereby addressing long-standing challenges associated with learner disengagement (Ferriz-Valero et al., 2020).

The theoretical foundation underpinning many gamification studies is Self-Determination Theory (SDT), which posits that optimal motivation and learning occur when individuals' basic psychological needs for autonomy, competence, and relatedness are satisfied (Deci & Ryan, 2000; Ryan & Deci, 2017). Gamified instructional designs often align closely with these principles by offering learners meaningful choices, immediate and informative feedback, achievable challenges, and opportunities for social interaction. Meta-analytic evidence suggests that when gamification is intentionally designed to support these psychological needs, it can significantly enhance intrinsic motivation and learning outcomes (Manzano-León et al., 2021; Basalan et al., 2024). Consequently, SDT provides a robust explanatory framework for understanding why gamified instruction may be more effective than traditional methods, particularly in experiential subjects such as MAPEH.

Despite the growing body of literature supporting gamification, several critical gaps remain. First, many studies have examined gamification in isolation, without directly comparing its effects to those of traditional instructional approaches within the same educational context. This limitation is especially evident in MAPEH-related research, where empirical comparisons between gamified and conventional teaching methods remain relatively scarce (Basalan et al., 2024). Second, existing studies often focus on short-term interventions with limited sample sizes, raising concerns about the generalizability and sustainability of reported effects (Li et al., 2023). Third, some scholars have cautioned that poorly designed gamification may overemphasize extrinsic rewards, potentially undermining intrinsic motivation if learners become overly dependent on points or badges rather than genuine interest in learning (Proudfoot, 2022; Ryan & Deci, 2023). These concerns highlight the need for rigorously designed studies that examine not only academic performance but also motivational outcomes grounded in established theory.

In the context of Philippine basic education, these issues are particularly salient. The Enhanced Basic Education Act of 2013 (Republic Act No. 10533) emphasizes learner-centered, innovative, and contextually relevant pedagogies to develop holistically skilled individuals. MAPEH, as a core subject area, plays a crucial role in achieving this mandate by fostering physical well-being, artistic expression, health literacy, and social development. However, traditional instructional practices continue to dominate many classrooms, potentially limiting the subject's capacity to engage learners and cultivate lifelong skills fully. Evaluating the effectiveness of gamified instruction in the Philippine MAPEH context is, therefore, both timely and policy-relevant.

Previous studies conducted in international contexts have reported that gamified instruction can lead to significant improvements in academic performance and motivation when compared to traditional methods. For example, Ferriz-Valero et al. (2020) found that gamification in physical education settings enhanced students' enjoyment and learning outcomes by promoting active engagement. Similarly, Li et al. (2023) reported moderate to large effect sizes for the impact of gamification on academic achievement and motivation, particularly when interventions emphasized an autonomy-supportive design. However, contextual differences in curriculum,

culture, and resource availability necessitate localized investigations to determine whether similar benefits can be realized in Philippine MAPEH classrooms.

Another limitation in the existing literature is the underrepresentation of learners' and teachers' perceptions in quantitative comparisons of instructional approaches. While statistical measures of achievement and motivation provide valuable evidence, understanding how students and educators experience gamified and traditional instruction is essential for informed implementation and sustainability. Studies incorporating perception data suggest that teacher acceptance and learner enjoyment are critical factors influencing the long-term success of gamified pedagogies (Chen & Lee, 2018; Merdiaty & Sulistiasih, 2024). Nonetheless, such insights are often treated as supplementary rather than integral components of comparative instructional research.

Given these gaps, there is a clear need for a systematic, theory-driven investigation that compares traditional and gamified instruction in MAPEH, focusing on both academic performance and motivation, while accounting for stakeholder perceptions. Addressing this need can refine instructional practices and provide evidence-based guidance to educators and policymakers seeking to enhance learner outcomes in interdisciplinary subjects.

The present study responds to this need by examining the effects of traditional versus gamified instruction on student learning and motivation in MAPEH. Grounded in Self-Determination Theory, the study examines whether gamified instruction results in significantly higher academic performance and motivation than traditional teaching methods. In addition, it explores learners' and teachers' perceptions of the effectiveness and practicality of gamified instruction. By employing a quantitative, quasi-experimental design, this research aims to generate objective, statistically supported evidence that can inform pedagogical decision-making and curriculum development.

Specifically, the study seeks to (a) compare the academic performance of learners exposed to traditional and gamified MAPEH instruction, (b) determine whether significant differences exist in learners' motivation levels under the two instructional approaches, and (c) examine learners' and teachers' perceptions of gamified instruction as a pedagogical strategy. By addressing these objectives, the study contributes to the growing literature on educational gamification while situating its findings within the Philippine basic education context.

Ultimately, this research aims to advance understanding of how instructional design influences motivation and learning in MAPEH and to support the development of practical, evidence-based strategies aligned with contemporary educational goals. By integrating theoretical rigor, empirical analysis, and contextual relevance, the study seeks to inform educators, curriculum developers, and policymakers about the potential of gamified instruction to enhance student engagement, motivation, and academic success in interdisciplinary learning environments.

2. Method

2.1 Research Design

This study employed a quantitative, quasi-experimental research design to examine the effects of traditional instruction and gamified instruction on students' academic performance and motivation in Music, Arts, Physical Education, and Health (MAPEH). A quasi-experimental approach was deemed appropriate because the study was conducted in an authentic school setting where random assignment of participants to experimental conditions was not feasible. Instead, intact class groups were utilized, allowing for systematic comparison while maintaining ecological validity.

The design followed a non-equivalent groups posttest-only comparison, involving two instructional conditions: (a) traditional instruction and (b) gamified instruction. Learners in the

traditional instruction group received lessons delivered through teacher-centered methods such as direct explanation, demonstrations, and conventional classroom activities. In contrast, learners in the gamified instruction group participated in instructional sessions integrating game design elements, including point systems, challenges, feedback mechanisms, and reward structures, all aligned with the MAPEH curriculum objectives.

The primary independent variable was the instructional approach, operationalized as traditional versus gamified instruction. The dependent variables were academic performance and learner motivation. Academic performance was measured using a standardized achievement test aligned with MAPEH learning competencies. At the same time, motivation was assessed through a validated self-report questionnaire grounded in Self-Determination Theory constructs of autonomy, competence, and relatedness. These outcome measures were administered after the instructional intervention to capture the effects of each teaching method.

To strengthen internal validity, efforts were made to ensure instructional equivalence across groups. Both groups covered identical MAPEH content, learning objectives, and instructional duration, with the instructional method serving as the sole systematic variation. Teachers implementing the interventions followed structured lesson plans to minimize instructional bias and variability. Additionally, demographic and contextual variables, such as age, gender, and prior academic performance, were recorded and statistically controlled for during data analysis to isolate the effect of instructional modality on learning outcomes.

The quasi-experimental design enabled the study to quantitatively determine whether there were significant differences between traditional and gamified instruction in academic achievement and motivation. This design is consistent with prior educational research examining instructional innovations in school settings, where experimental control must be balanced with practical and ethical constraints. By employing this approach, the study generated objective, statistically analyzable evidence regarding the comparative effectiveness of gamified and traditional instructional strategies in MAPEH education.

2.2 Participants

The study participants were high school learners enrolled in MAPEH in a Philippine secondary school setting. Participants were drawn from intact class groups within the same campus where the study was implemented, consistent with the quasi-experimental nature of the research and the practical constraints of conducting classroom-based educational interventions.

Learners participated voluntarily and were assessed across two instructional conditions: traditional and gamified.

A total of 100 learners comprised the analytic sample, as reflected in the degrees of freedom reported for the independent-samples t-tests (df = 98), indicating two groups with a combined sample size of 100.

The two groups represented non-equivalent but comparable intact classes, with efforts undertaken to ensure comparability by documenting relevant learner characteristics and accounting for these variables during analysis to reduce confounding.

2.3 Instrumentation

Three quantitative instruments were used to generate the study dataset: (a) a MAPEH achievement test to measure academic performance, (b) a motivation questionnaire grounded in Self-Determination Theory constructs, and (c) structured perception surveys for learners and teachers regarding the implementation and perceived effects of gamified instruction.

Academic performance (MAPEH achievement test). Academic performance was operationalized as learners' post-intervention achievement in MAPEH content covered during the instructional period. A researcher-prepared, curriculum-aligned standardized achievement test was administered to both instructional groups at the end of the intervention to ensure

comparability of performance scores. Test development was aligned with MAPEH learning objectives and intended to evaluate knowledge and skills acquisition in the subject domain. Content validity was supported through expert review by MAPEH subject specialists, and the instrument underwent pilot testing to verify reliability prior to implementation. The achievement test produced continuous numeric scores used for group comparisons in inferential analysis.

Learner motivation (motivation questionnaire). Learner motivation was measured using a structured questionnaire based on validated psychometric scales consistent with Self-Determination Theory (autonomy, competence, and relatedness). The instrument used a Likert-type response format to quantify learners' motivational states following exposure to either traditional or gamified instruction. Items were designed to capture both intrinsic and extrinsic motivational dimensions relevant to classroom engagement and persistence. The questionnaire was administered concurrently with the achievement test to reflect motivation in the immediate post-intervention context and to enable linking motivational scores with academic performance outcomes.

Perception measures (learner and teacher perception surveys). To complement the outcome measures, structured perception surveys were administered to both learners and teachers to quantify attitudes and experiences regarding gamified instruction in MAPEH. Perception items assessed implementation-relevant dimensions such as engagement, enjoyment, classroom atmosphere, perceived learning support, practicality, and resource demands. The learner survey was presented as a two-part instrument containing items specific to motivational engagement and perceptions of gamification; the teacher perception survey mirrored these dimensions from an instructional and feasibility perspective. Both instruments generated mean perception scores, which were summarized descriptively and interpreted alongside the primary academic and motivational outcomes.

Across all instruments, administration procedures were standardized to minimize measurement bias. Data were anonymized prior to analysis, and collected responses were treated as confidential in accordance with the study's ethical and data protection procedures.

2.4 Data Analysis

All quantitative data were encoded, cleaned, and prepared for statistical analysis following completion of the post-intervention assessments. Descriptive statistics were computed for all outcome measures, including means (M) and standard deviations (SD), to summarize learners' academic performance and motivation levels by instructional group (traditional vs. gamified). Mean perception scores and variability indices were also generated for the learner and teacher perception measures.

To address the study's primary comparative questions, independent-samples t-tests were employed to determine whether statistically significant differences existed between the traditional instruction and gamified instruction groups in (a) academic performance scores and (b) motivation scores. Results were evaluated at the .05 level of significance, consistent with the stated hypothesis-testing criterion. For each t-test, the test statistic, degrees of freedom, and p-value were reported to support inferential conclusions.

Where applicable, the analysis plan incorporated procedures to reduce confounding attributable to pre-existing differences between intact class groups, consistent with a quasi-experimental design. Specifically, relevant demographic and contextual variables (e.g., age, gender, and prior academic performance) were documented and treated as control variables in the analysis to isolate the estimated effect of the instructional approach on the outcome measures. In line with the methodological plan described in the manuscript, analysis of covariance (ANCOVA) was identified as an additional inferential technique for comparing group outcomes while statistically adjusting for covariates when assumptions and data structure warranted its application.

Perception data from learners and teachers were analyzed quantitatively using descriptive summary procedures. Item-level responses were aggregated to compute composite perception scores, and group means were reported to characterize overall attitudes toward gamified instruction and its perceived effects on engagement, learning support, and classroom climate. These perception results were used to contextualize the primary achievement and motivation findings.

All analyses were conducted using standard statistical procedures suitable for comparing two independent instructional groups and for evaluating statistical significance under a quasi-experimental design. Outputs were organized according to the study's research questions, with results presented in tables and narrative reporting consistent with quantitative reporting conventions.

3 Results

Learners exposed to gamified instruction demonstrated higher academic performance than those who received traditional instruction. The mean achievement score for the traditional instruction group was 74.23 (SD = 8.45), whereas the gamified instruction group obtained a mean score of 83.56 (SD = 7.12). An independent-samples t-test indicated that the difference in academic performance between the two instructional conditions was statistically significant, $t(98) = 5.87$, $p < .001$, indicating that learners in the gamified instruction condition achieved significantly higher post-intervention performance than those taught through traditional approaches.

Motivation outcomes similarly favored the gamified instruction condition. Learners who received traditional instruction reported a mean motivation score of 3.02 (SD = 0.45), while learners exposed to gamified instruction reported a higher mean motivation score of 3.78 (SD = 0.40). The independent-samples t-test results showed that the difference in motivation levels between the two groups was statistically significant, $t(98) = 7.14$, $p < .001$, indicating that gamified instruction was associated with higher learner motivation than traditional instruction.

Perception measures further indicated favorable responses to gamified instruction among both stakeholder groups. Learners reported a high mean perception score of 4.21 (SD = 0.38), while teachers also reported a positive mean perception score of 4.05 (SD = 0.42). These descriptive results indicate that both learners and teachers generally perceived gamified instruction as beneficial and positively experienced in the MAPEH context.

4. Discussion

The present study found that learners who received gamified instruction in MAPEH achieved significantly higher academic performance and reported significantly higher motivation than learners who received traditional instruction. These findings align with the broader empirical consensus that gamification—when implemented as an instructional design approach rather than as superficial rewards—tends to improve learning outcomes and motivational indicators relative to non-gamified conditions. Meta-analytic evidence has consistently reported positive effects of gamification on cognitive, motivational, and behavioral outcomes, although effect magnitudes vary based on design quality, subject domain, duration, and the specific game elements employed (Landers et al., 2019; Li, Hew, & Du, 2024; Li, Ma, & Shi, 2023). In the context of MAPEH, where engagement and sustained participation are essential to skill development, the observed advantages of gamified instruction are theoretically coherent and practically meaningful.

The significantly higher achievement scores among learners in the gamified condition are consistent with evidence that gamification can enhance learning performance by increasing task engagement, time-on-task, and persistence. Landers et al. (2019) argued that gamification is most likely to influence learning outcomes indirectly through mediators such as motivation and behavior, rather than functioning as a direct instructional substitute. In other words, game elements may not "teach" content on their own, but they can strengthen the learning process by

increasing learners' willingness to engage in practice and feedback cycles. This mechanism is particularly applicable to MAPEH, which frequently requires repeated rehearsal of competencies (e.g., movement patterns, performance tasks, and applied health behaviors) that can be perceived as effortful when delivered through purely didactic formats.

Findings in physical education-related research provide further support for the academic benefits observed in this study. Ferriz-Valero et al. (2020) reported that gamified learning environments can improve motivation and learning-relevant behaviors, with measurable impacts on academic performance indicators within physical education training contexts. Although participants and levels of schooling differ across studies, the convergent pattern suggests that gamification can improve performance in domains that depend on active participation and experiential engagement. Importantly, the observed academic advantage in the present study likely reflects not only increased enjoyment, but also improved instructional conditions such as clearer progression pathways, frequent formative feedback, and structured challenges—features commonly associated with effective gamified learning designs (Hamari, Koivisto, & Sarsa, 2014).

The higher motivation scores among learners who received gamified instruction are highly consistent with Self-Determination Theory (SDT), which posits that motivation is strengthened when learning contexts satisfy needs for autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2017). Gamified instruction often operationalizes these needs through design choices such as (a) meaningful choices and optional pathways (autonomy), (b) immediate feedback and incremental difficulty (competence), and (c) team-based challenges and social comparison features (relatedness). When these elements are present, learners may experience the instructional environment as more self-relevant and supportive, shifting motivation toward more autonomous forms associated with persistence and deeper engagement (Deci & Ryan, 2000; Ryan & Deci, 2017).

Recent syntheses strengthen this theoretical interpretation. A meta-analysis and systematic review by Li, Hew, and Du (2024) found that gamification can increase students' intrinsic motivation and perceptions of autonomy and relatedness. However, effects can differ depending on implementation and measurement. This nuance is important for interpreting the present study: motivation gains should not be assumed to occur uniformly across all gamification designs. Instead, motivation benefits are most plausible when game elements are integrated to reinforce competence-building feedback and autonomy-supportive participation, rather than relying primarily on external rewards.

Both learners and teachers expressed favorable perceptions of gamified instruction in the present study. This result is practically significant because teacher acceptance, perceptions of feasibility, and classroom manageability strongly influence whether gamified approaches are sustained beyond a research setting. Prior evidence suggests that learners' perceptions of enjoyment, progress visibility, and classroom climate often improve under gamified learning conditions, which in turn supports continued engagement (Hamari et al., 2014). Similarly, systematic mapping work on gamification in education highlights that many studies report positive attitudes toward gamified approaches, although rigorous comparative evidence remains less common and implementation quality is variable (Dicheva, Dichev, Agre, & Angelova, 2015).

In MAPEH specifically, favorable perceptions can be interpreted as an indicator that gamified strategies may be compatible with the subject's performance-oriented and participatory nature. However, positive perception findings should be interpreted cautiously. Perceptions may reflect novelty effects, differential teacher enthusiasm, or class-level dynamics that are not solely attributable to the instructional method. This reinforces the value of the study's comparative design and inferential findings, which provide stronger evidence than perception data alone that gamified instruction was associated with measurable differences in performance and motivation.

While the results support gamified instruction, the broader literature also cautions against designs that overemphasize extrinsic rewards (e.g., points, badges) without supporting autonomy

and competence. SDT predicts that controlling reward structures can undermine autonomous motivation when learners perceive participation as externally pressured rather than self-endorsed (Deci & Ryan, 2000; Ryan & Deci, 2017). The practical implication for MAPEH is that gamification should be implemented as an autonomy-supportive framework—emphasizing mastery, feedback, goal clarity, and social belonging—rather than as a token economy. The meta-analytic evidence showing variability across outcomes underscores that "gamification" is not a single intervention; its effectiveness depends on the alignment between game elements, learning tasks, and motivational processes (Li, Hew, & Du, 2024; Li, Ma, & Shi, 2023).

From a policy perspective, the study aligns with the Philippine education agenda, which emphasizes learner-centered, context-responsive pedagogy. Republic Act No. 10533 underscores curriculum principles that support collaborative, integrative, and developmentally appropriate approaches, which can be operationalized through well-designed gamified learning experiences (Republic Act No. 10533, 2013). In addition, data-handling and participant-protection requirements under Republic Act No. 10173 highlight the importance of secure data practices when using digital or platform-enabled gamification systems (Republic Act No. 10173, 2012). For classroom practice, the findings suggest that gamified instruction can be used as a structured strategy to enhance both engagement and measurable outcomes in MAPEH, particularly when teachers are supported with design templates, training on autonomy-supportive facilitation, and mechanisms for monitoring learner progress.

Overall, the findings contribute to the growing evidence base that gamified instruction—when implemented thoughtfully and grounded in motivational theory—can outperform traditional instruction across both academic and motivational outcomes. In MAPEH, where participation quality and sustained engagement are central to achieving holistic learning goals, gamification may serve as a practical instructional innovation that strengthens learner motivation while improving achievement, provided that implementation emphasizes mastery, feedback, and meaningful participation rather than reward accumulation.

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IMPACT OF SPORTS INJURIES ON THE PSYCHOLOGICAL WELLBEING OF COLLEGIATE ATHLETES

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Abstract

Sports injuries are common in collegiate sports and may extend beyond physical harm to affect athletes' mental health. This study investigated the impact of sports injuries on the psychological well-being of varsity athletes at a selected university in Dagupan City, Philippines. A quantitative cross-sectional descriptive–comparative design was employed. Two hundred collegiate athletes completed a structured self-report questionnaire assessing demographic characteristics, injury history, and psychological well-being indicators, including anxiety, depressive symptoms, mood states, perceived stress, and self-esteem. Descriptive statistics summarized injury prevalence and well-being levels, while inferential tests examined relationships and group differences.

Findings revealed a high prevalence of injury: 63% (126 of 200) reported at least one sports-related injury during their collegiate athletic career. Injured athletes demonstrated significantly poorer psychological well-being than non-injured athletes, showing higher levels of anxiety, depressive symptoms, negative mood states, and perceived stress, alongside lower self-esteem. In addition, injury burden was negatively associated with psychological well-being: as the number and perceived severity of injuries increased, distress indicators rose, and self-esteem declined. Injury classification also mattered. Athletes with acute injuries experienced greater anxiety, negative mood, and stress than those with overuse injuries, although depressive symptoms did not significantly differ between these groups.

Overall, the results indicate that sports injuries pose a substantial risk to the psychological well-being of collegiate athletes and support the integration of mental health screening and tailored psychological interventions within injury prevention and rehabilitation programs.

Keywords: Sports Injuries; Psychological Well-Being; Collegiate Athletes; Anxiety; Depression; Mood States; Acute Injuries; Overuse Injuries; Dagupan City; Philippines

1. Introduction

Sports participation has long been recognized as a powerful vehicle for holistic development, particularly among students who engage in organized athletics. At the collegiate level, varsity sports cultivate discipline, social connectedness, leadership, and physical fitness, all of which are linked to positive educational and life outcomes. In the Philippines, this emphasis on sport aligns with the Department of Education's (DepEd) continuing commitment to learner welfare and development through structured sports programs. DepEd policy frameworks underscore that the student-athlete must be supported as a "student first," with rights that include protection of general well-being and health (Department of Education [DepEd], 2021). Notably, DepEd Order No. 052, s. 2021, which disseminates the Implementing Rules and Regulations (IRR) of Republic Act (RA) 10676 or the Student-Athletes Protection Act, explicitly reinforces the State's mandate to safeguard student-athletes' overall welfare across educational institutions, including higher education (DepEd, 2021; DepEd, 2021 DM No. 231). Parallel to this, DepEd has recently intensified mental health promotion through the Implementing Rules and Regulations of RA 12080, the Basic Education Mental Health and Well-Being Promotion Act, which calls for

stronger mental health and psychosocial services embedded within school health and wellness activities, including sports-related programs (DepEd, 2025a). Likewise, DepEd's School-Based Mental Health Program guidelines emphasize prevention, early identification, and responsive care for mental health concerns among learners (DepEd, 2025b). Although these policies primarily target basic education, they reflect a national direction that places mental well-being at the center of learner development, a principle equally applicable to tertiary student-athletes.

However, despite the developmental benefits of sports, collegiate athletes face an unavoidable reality: injury risk is intrinsic to competitive participation. Muscle strains, sprains, fractures, concussions, and chronic overuse injuries remain common in varsity sports due to high training volumes and intense performance demands. International evidence indicates that sport-related injuries are not merely physical disruptions; instead, they often initiate significant emotional and cognitive responses that can alter an athlete's psychological functioning. Contemporary models of sport-injury response show that injuries affect pain perception, thought patterns, emotions, and health-related behaviors, which collectively shape psychological well-being during recovery (Wiese-Bjornstal, 2019). A substantial body of research confirms that injured athletes frequently experience heightened anxiety, depressive symptoms, irritability, fear of reinjury, and lowered self-confidence, especially when injuries lead to prolonged removal from sport or threaten athletic identity (Arvinen-Barrow & Walker, 2022; Yang et al., 2023). Systematic reviews further reveal that post-injury mental health symptoms are widespread in collegiate sport populations, with psychological strain often emerging alongside rehabilitation challenges and uncertainty about return-to-play (Sabol et al., 2020). In particular, studies of collegiate athletes consistently report that depression and anxiety symptoms may rise after injury, reducing adherence to rehabilitation and overall life satisfaction (Brewer & Redmond, 2022; Leddy et al., 2021).

Moreover, the psychological effects of injuries differ depending on injury characteristics. Acute injuries—those sudden and traumatic in onset—tend to trigger strong immediate emotional reactions such as shock, anxiety, and mood disruption. By contrast, overuse injuries develop gradually and are typically associated with frustration, burnout-related emotions, and a prolonged sense of helplessness due to recurring pain and delayed recovery (Ivarsson et al., 2021). A recent consensus review of sport-injury psychology emphasizes that stress responses and emotional dysregulation strongly predict acute injuries. At the same time, psychosocial and sociocultural stressors are also implicated in overuse injury processes (Forsdyke et al., 2025). These findings suggest that psychological well-being is both an outcome of injury and a factor intertwined with the injury experience, indicating a bidirectional, complex relationship worthy of local investigation.

Despite growing global evidence, a significant gap remains in Philippine collegiate contexts. Most published injury-psychology studies are concentrated in North America, Europe, and Australia, where institutional athletic resources and mental health systems differ greatly from those in many Philippine universities. Local collegiate athletes may experience unique stressors, including limited rehabilitation support, fewer sports-psychology services, financial pressures, and sociocultural expectations of toughness and endurance. While DepEd policies increasingly foreground mental health and student-athlete protection (DepEd, 2021; DepEd, 2025a), empirical research that directly examines how sports injuries shape psychological well-being in Philippine higher education remains scarce. This lack of localized evidence creates a practical challenge: without context-specific data, universities may struggle to design injury rehabilitation programs that address the mental and emotional needs of injured athletes in a culturally responsive way. Consequently, there is a pressing need to generate local findings that connect injury prevalence and injury type to measurable psychological outcomes.

In response to this research space, the present study investigates the impact of sports injuries on the psychological well-being of collegiate athletes enrolled in a selected university in Dagupan City. Following a quantitative, cross-sectional, descriptive–comparative design, the

study determines injury prevalence, assesses psychological well-being among injured athletes, examines relationships between injury burden and mental health indicators, compares injured and non-injured groups, and analyzes psychological differences between acute and overuse injuries. By grounding the inquiry in the national policy direction on learner welfare and mental health promotion (DepEd, 2021; DepEd, 2025a, 2025b), the study aims to provide evidence to guide university-level interventions, support systems, and referral pathways. Ultimately, this work seeks to reinforce a holistic athlete-care model in which psychological recovery is treated as essential as physical rehabilitation, thereby aligning varsity sport practice with the broader Philippine education mandate to protect student well-being.

2. Method

2.1 Research Design

This study utilized a quantitative cross-sectional research design, specifically a descriptive–comparative approach, to examine the impact of sports injuries on the psychological well-being of collegiate athletes from a selected university in Dagupan City during Academic Year 2024–2025. Data were collected at a single point in time using standardized self-report questionnaires administered to approximately 200 varsity athletes, covering demographic information, injury status and history, injury type (acute or overuse), and psychological well-being indicators such as anxiety, depression, mood states, perceived stress, and self-esteem. Descriptive statistics were used to determine injury prevalence and summarize well-being levels. At the same time, inferential analyses (e.g., correlation tests and group-comparison procedures) assessed relationships between injury variables and psychological outcomes and tested differences between injured and non-injured athletes and across injury types, without manipulating any variables.

2.2 Participants

The study was conducted with approximately 200 collegiate varsity athletes enrolled in a selected university in Dagupan City, Philippines, during the School Year 2024–2025. These athletes were actively participating in officially recognized university sports programs across various disciplines and were recruited through convenience sampling in coordination with coaches and athletic administrators. Eligible participants included male and female student-athletes who were currently training and competing for their respective varsity teams and who consented to take part in the research; athletes who were not active in varsity participation during the data-collection period or who had injuries unrelated to sports participation were excluded. This participant group provided the necessary data to determine injury prevalence, compare injured and non-injured athletes, and analyze how injury type relates to psychological well-being within the university athletic context.

2.3 Instrumentation

The study used a structured self-report questionnaire as the primary instrument, composed of three parts: (1) a demographic profile sheet gathering age, sex, year level, and varsity sport participation; (2) a sports injury history checklist that asked athletes to report any collegiate sport–related injuries, indicating type (e.g., sprain, strain, fracture, dislocation, tendinitis, stress fracture), date of occurrence, body part affected, perceived cause, and classification as acute or overuse, which enabled grouping into injured and non-injured categories; and (3) standardized psychometric scales measuring psychological well-being, specifically assessing anxiety, depressive symptoms, negative mood states, perceived stress, and self-esteem using Likert-type response formats to generate quantitative scores. The

instrument was pilot-tested with a small group of non-participant athletes to ensure clarity, suitability, and reliability prior to complete administration.

2.4 Data Analysis

Data were analyzed using both descriptive and inferential statistics. First, frequencies and percentages were computed to determine the prevalence of sports injuries and to classify respondents as injured or non-injured, while means and standard deviations summarized psychological well-being scores across anxiety, depressive symptoms, negative mood states, perceived stress, and self-esteem. To examine relationships, Pearson's product–moment correlation was used to assess the association between injury variables and psychological well-being indicators. For group comparisons, independent-samples t-tests were conducted to examine significant differences in psychological well-being between injured and non-injured athletes, and another t-test (or a one-way ANOVA if more than two groups were present) was used to compare psychological outcomes across injury types. Effect sizes were calculated to assess the magnitude of observed differences, and all tests were interpreted at the 0.05 level of significance to ensure rigorous, objective conclusions.

3 Results

The results showed that sports injuries were highly prevalent among the collegiate athletes in the selected university. Out of 200 respondents, 63% (126 athletes) reported having sustained at least one sports-related injury during their collegiate athletic career, while 37% (74 athletes) reported no injury experience. This distribution indicates that the majority of varsity athletes had been exposed to injury risk, highlighting that injury occurrence is an everyday reality within the university sports environment.

Moreover, the psychological well-being of athletes who had experienced injuries was notably compromised. On average, injured athletes registered elevated mean scores in anxiety symptoms, depressive symptoms, negative mood states, and perceived stress, alongside reduced mean self-esteem levels. These patterns suggest that injured athletes were dealing with substantial psychological distress during or after their injury experiences, implying that the effects of injury extend beyond physical setbacks into emotional and mental functioning.

In addition, statistical testing revealed a significant negative relationship between sports injuries and psychological well-being. Specifically, as the number of injuries increased and as injuries were perceived to be more severe, athletes tended to report higher anxiety, stronger depressive symptoms, more negative mood states, and greater perceived stress, while self-esteem decreased. This finding indicates a precise dose–response pattern, where greater injury burden corresponded to poorer psychological outcomes.

Finally, comparative analyses demonstrated that injured athletes consistently exhibited worse psychological well-being than their non-injured counterparts across all measured dimensions, with large to huge effect sizes indicating a substantial gap between groups. When injury type was considered, acute injuries were linked to significantly higher anxiety, negative mood, and stress compared to overuse injuries; however, depressive symptoms did not differ substantially between the two injury categories. Interestingly, self-esteem was lower among athletes with acute injuries but relatively higher among those with overuse injuries, suggesting that the psychological impact of injury varies by classification and may reflect differences in coping demands and perceived control.

4. Discussion

The present findings on the high prevalence of injuries (63% of athletes reporting at least one injury) are consistent with broader collegiate-sport evidence showing that injury exposure is a routine part of varsity participation. International literature repeatedly reports high injury rates

among university athletes due to intensive training loads and competitive demands, making injuries a normative rather than exceptional experience in collegiate sport settings (Arvinen-Barrow & Walker, 2022; Wiese-Bjornstal, 2019). Similarly, recent multi-sport surveys indicate that collegiate athletes commonly sustain injuries across a single season or career, reinforcing the idea that injury prevention and monitoring must be central in university athletics (Yang et al., 2023). Thus, the prevalence observed in this study corroborates established patterns and supports the claim that Dagupan City collegiate athletes face injury risks comparable to those documented globally.

Moreover, the finding that injured athletes showed poorer psychological well-being—marked by higher anxiety, depressive symptoms, negative mood, and stress alongside lower self-esteem—echoes a large body of sport-injury psychology research. Contemporary models emphasize that injury disrupts not only the body but also cognition, emotion, and behavior, often threatening athletic identity and daily routine (Wiese-Bjornstal, 2019; Wiese-Bjornstal et al., 1998). In the same vein, narrative and systematic reviews of student-athletes highlight frequent post-injury emotional reactions such as sadness, fear of reinjury, frustration, and reduced confidence, which can develop into clinically relevant anxiety or depressive symptoms if unaddressed (Putukian, 2016; Sabol et al., 2020). Therefore, the psychological distress reported by injured athletes in this study aligns closely with prior research and supports the argument that injury recovery should be treated as both a physical and mental-health process.

In addition, the significant negative relationship between injury burden (number and severity) and psychological well-being mirrors findings from recent empirical studies. Evidence indicates a “dose–response” pattern: athletes with more frequent or severe injuries tend to show escalating psychological strain, including elevated anxiety and depression and declining self-worth (Brewer & Redmond, 2022; Impact of Injury Frequency and Severity on Mental Health, 2025). For example, longitudinal work using the DASS-21 and POMS similarly found that increasing injury frequency and perceived severity predicted worsening mental health indicators over time (Impact of Injury Frequency and Severity on Mental Health, 2025). Consequently, the current study corroborates the established view that psychological risk intensifies as injury experiences accumulate, emphasizing the need for early screening and targeted support for athletes with recurrent or severe injuries.

Furthermore, the significant difference in psychological well-being between injured and non-injured athletes—with large effect sizes—reflects robust comparative evidence in collegiate populations. Research consistently shows that injured athletes report substantially higher distress and lower self-esteem than their healthy peers, suggesting that injury status alone creates a meaningful psychological divide (Sabol et al., 2020; The Sport Journal, 2025). This aligns with conclusions that injuries may aggravate preexisting symptoms or unmask latent mental-health vulnerabilities, particularly during periods of forced rest, social isolation from teammates, or uncertainty about return-to-play (Putukian, 2016). Hence, the sharp injured–non-injured gap identified in this study is not an isolated local trend but a well-documented phenomenon that confirms the mental-health burden of injuries among student-athletes.

Finally, the study’s injury-type differences—where acute injuries produced higher anxiety, negative mood, and stress than overuse injuries, while depressive symptoms did not differ—are also supported by current frameworks. The 50-year consensus on sport-injury psychology notes that acute injuries are strongly linked to stress reactions and immediate emotional dysregulation. In contrast, overuse injuries often reflect chronic psychosocial strain and different coping profiles (Forsdyke et al., 2025). Likewise, literature on maintaining control and appraisal in injury suggests that sudden traumatic events (acute injuries) commonly provoke fear and anxiety spikes. In contrast, gradual-onset injuries can elicit frustration and longer-term adjustment stress, sometimes without sharply different depression levels (Ivarsson et al., 2021). Therefore, the present pattern corroborates the view that psychological responses are injury-specific, supporting

the recommendation for tailored interventions based on whether injuries are acute or overuse-related.

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IMPROVING ENGLISH READING ACCURACY OF GRADE 3 LEARNERS THROUGH THE IMPLEMENTATION OF ECHO READING TECHNIQUE

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Abstract

This study examined the effectiveness of the Echo Reading Technique in improving English reading accuracy among Grade 3 learners at Bocacliw Elementary School, Aguilar District, Pangasinan I, during School Year 2024–2025. Twenty-five pupils with low word-recognition performance participated in a 20-day intervention. Echo Reading was implemented through teacher-modeled oral reading, followed by learners' immediate repetition of the same lines in short, meaningful phrases, with guided pacing and corrective feedback. The approach aimed to strengthen word recognition, reduce miscues, and build reading confidence through repeated, scaffolded oral practice.

A single-group pretest–posttest quasi-experimental design was employed. Reading accuracy was assessed using Phil-IRI–aligned oral reading passages, with performance grouped into frustration, instructional, and independent levels and summarized through mean word-recognition scores. Results indicated notable descriptive gains. At pretest, 48% of learners were classified as frustrated, 36% as instructional, and 16% as independent. After the intervention, frustration decreased to 4% among readers, instructional readers decreased to 8%, and independent readers increased to 88%. Mean scores improved from 44.80 (SD = 2.94) to 48.52 (SD = 1.14). However, the paired t-test showed no statistically significant difference between pre- and post-scores ($t = 0.79$, $p = 0.436$).

Despite the non-significant inferential result, the pronounced shift in reading levels suggests Echo Reading is a practical scaffolding strategy for enhancing accuracy and confidence among beginning English readers. Sustained classroom use and further studies with larger samples and comparison groups are recommended.

Keywords: Echo Reading Technique; Reading Accuracy; Word Recognition; Oral Reading Fluency; Grade 3 Learners; Phil-IRI

1. Introduction

Early literacy is a foundational competence that shapes learners' academic trajectories, civic participation, and long-term life chances. By the primary grades, children are expected to transition from "learning to read" to "reading to learn," yet this shift is constrained when decoding and word recognition remain weak. Globally, the World Bank and partner agencies describe this condition as "learning poverty," defined as the inability to read and understand an age-appropriate text by age 10 (World Bank, 2022). The learning poverty crisis is especially acute in low- and middle-income contexts, where pandemic disruptions and structural inequities have slowed reading development in the early grades (World Bank et al., 2022). In the Philippines, recent World Bank briefs and national reports estimate that roughly 9 out of 10 children are learning poorly, indicating that most Filipino learners reach late elementary grades without adequate reading proficiency (World Bank, 2022; Philstar, 2023). Such national-level evidence underscores the urgency of classroom-based interventions that directly improve foundational reading skills.

Consistent with these realities, the Department of Education (DepEd) has intensified early-grade literacy programs and requires schools to implement targeted remediation for low-emergent readers, particularly in Grades 1–3 (Department of Education, 2018; PIA, 2025). DepEd mandates

the Philippine Informal Reading Inventory (Phil-IRI) as a classroom-based diagnostic to identify learners' independent, instructional, and frustration reading levels in English and Filipino (Department of Education, 2018; DepEd, 2018 Phil-IRI Manual). The Phil-IRI framework emphasizes oral reading accuracy through word recognition rates and miscue analysis, enabling teachers to design responsive interventions for pupils who struggle with decoding and fluent oral reading. However, despite programmatic reforms, many schools continue to face persistent gaps in English reading accuracy, especially among Grade 3 learners who must already engage with more complex texts across the curriculum. Therefore, localized action research remains essential to test feasible instructional strategies that can be embedded in daily teaching routines.

Reading accuracy is a core component of oral reading fluency, alongside rate and prosody. Fluency reflects the extent to which word recognition becomes automatic, freeing cognitive resources for comprehension (Rasinski, 2014). When learners decode slowly or inaccurately, working memory is consumed by word-level processing, leaving little capacity for meaning-making. Extensive research shows that fluency instruction is not only an outcome but also a mechanism to improve comprehension and overall reading achievement (NICHD, 2000). The National Reading Panel's synthesis found robust evidence for guided repeated oral reading procedures, wherein students reread texts with teacher modeling and corrective feedback, leading to improvements in word recognition, fluency, and comprehension (NICHD, 2000). Subsequent scholarship further supports the use of repeated reading as among the most empirically validated fluency interventions across diverse learner profiles, including those at risk for reading disabilities (Rasinski, 2006; ASHA, 2025).

Echo Reading is a specific guided oral reading technique situated within the traditions of repeated reading and modeling. In Echo Reading, the teacher reads a short segment of text aloud with appropriate pacing and expression, and learners immediately repeat (or "echo") the same segment, replicating pronunciation, phrasing, and prosody (Five from Five, 2024). This routine provides an explicit scaffold for beginning readers by reducing text load, clarifying pronunciation and intonation, and allowing immediate corrective feedback (Five from Five, 2024; The Edvocate, 2025). The strategy aligns with socio-cognitive theories of learning, particularly Vygotsky's zone of proximal development, where teacher modeling and structured practice enable learners to perform reading tasks they could not yet accomplish independently. Echo Reading also supports automaticity theory by increasing the frequency of accurate practice on meaningful text, gradually strengthening rapid word recognition. Practically, it is adaptable to whole-class, small-group, and one-to-one contexts, and is considered developmentally appropriate for early elementary pupils who require frequent exposure to fluent reading models (Jennings et al., 2014, as cited in Strategies for Special Interventions, 2025).

At Bocacliw Elementary School, Aguilar District, Pangasinan I, classroom assessments and Phil-IRI results in School Year 2024–2025 revealed that many Grade 3 learners were performing at the frustration and instructional levels in English oral reading. These pupils exhibited frequent miscues, hesitations, and mispronunciations that limited both fluency and comprehension. Such performance profiles mirror broader Philippine patterns of early-grade reading weakness and indicate the need for structured, evidence-based intervention at the classroom level. While DepEd literacy initiatives provide broad guidance, teachers must still operationalize these in daily instruction using strategies suited to learners' immediate needs and school constraints. Echo Reading is promising in this regard because it is low-cost, time-bounded, and compatible with existing guided reading and remediation sessions. However, local evidence on its effectiveness for Grade 3 English reading accuracy in rural public schools remains limited, especially when implemented as a sustained, teacher-led routine.

Against this backdrop, the present study, "Improving English Reading Accuracy of Grade 3 Learners Through the Implementation of Echo Reading Technique," investigated whether a 20-day Echo Reading intervention could improve the oral reading accuracy of Grade 3 pupils

identified as struggling readers through Phil-IRI screening. Specifically, the study sought to (a) determine learners' pre-intervention English reading accuracy levels using Phil-IRI-aligned measures, (b) implement Echo Reading as a daily guided oral reading routine, (c) assess post-intervention reading accuracy levels, and (d) test whether the observed change was statistically significant. By generating localized evidence, the study aimed to support teacher decision-making, contribute to school-level literacy planning, and inform future iterations of DepEd reading remediation initiatives. Ultimately, strengthening reading accuracy in Grade 3 is a strategic leverage point for reducing learning poverty, as mastery of word recognition and fluent oral reading enables learners to engage meaningfully with grade-level texts and content demands.

2. Method

2.1 Research Design

The participants of the study were twenty-five (25) Grade 3 learners enrolled at Bocacliw Elementary School, Aguilar District, Pangasinan I, during School Year 2024–2025. They were selected through purposive sampling based on Phil-IRI pre-assessment results indicating low English oral reading accuracy, particularly learners classified at the frustration and instructional levels in word recognition. This targeted selection ensured that the intervention addressed pupils with the most immediate remediation needs in decoding and pronunciation. The group represented the intact class of struggling readers under the researcher's instructional context, allowing close monitoring of individual progress during the 20-day Echo Reading implementation. Demographic or achievement variations within the group were treated as natural classroom conditions, consistent with the action-research goal of improving literacy outcomes for learners most at risk.

2.2 Participants

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2.3 Instrumentation

The study used Phil-IRI–aligned oral reading assessment tools as its primary instruments to measure English reading accuracy among the Grade 3 participants. Specifically, graded English reading passages appropriate for the Grade 3 level were administered in a one-on-one oral reading format during both the pretest and posttest to ensure comparability of results. Learners' performances were recorded through word recognition scores and miscue analysis (e.g., mispronunciations, substitutions, omissions, reversals, and self-corrections), which were then converted into percentage accuracy and categorized according to DepEd Phil-IRI standards into independent, instructional, and frustration reading levels. These instruments provided both quantitative indicators (mean accuracy scores, standard deviations, and level distributions) and diagnostic evidence of specific reading difficulties, enabling the researcher to evaluate changes

attributable to the Echo Reading intervention and to document shifts in oral reading accuracy over the 20-day implementation period.

2.4 Data Analysis

The study combined descriptive and inferential procedures to determine changes in English reading accuracy following the Echo Reading intervention. Pretest and posttest oral reading results were first tabulated to obtain each learner's word-recognition percentage and corresponding Phil-IRI reading level (independent, instructional, frustration). Frequencies and percentages were computed to describe shifts in level distribution, while means and standard deviations summarized overall performance before and after the 20-day implementation. To test whether the observed gain in reading accuracy was statistically significant, the study applied a paired-samples t-test comparing pretest and posttest mean scores at the 0.05 alpha level. This within-subject analysis was appropriate for the single-group quasi-experimental design, enabling the researcher to quantify improvement trends, evaluate the significance of change, and substantiate conclusions regarding the intervention's effectiveness.

3. Results

The study found clear improvement in the English reading accuracy of Grade 3 learners after the 20-day Echo Reading intervention. In the pretest, most pupils demonstrated weak word recognition, with nearly half of the group classified as frustrated. Specifically, 12 learners (48%) were frustrated readers, 9 (36%) were at the instructional level, and only 4 (16%) were independent readers. This distribution indicated that the majority could not read grade-level English text accurately without substantial teacher support, reflecting the baseline reading difficulty that justified the intervention.

Following the implementation of Echo Reading, the posttest results reflected a marked shift toward higher reading accuracy and more proficient reading levels. Only one learner (4%) remained at the frustration level; 2 learners (8%) were instructional readers; and 22 learners (88%) moved to the independent level. Compared with the pretest distribution, this represents a substantial reduction in low-performing readers and a strong increase in pupils able to read English text accurately and with minimal assistance. These gains suggest that Echo Reading served as effective scaffolding for learners who initially struggled with pronunciation, decoding, and word recognition.

The descriptive statistics reinforced this improvement trend. The mean pretest word-recognition score was 44.80 (SD = 2.94), while the posttest mean increased to 48.52 (SD = 1.14), indicating an average gain of 3.72 points. In addition to the mean improvement, the reduced posttest standard deviation suggests that learners' performances became more consistent over time, with fewer extremely low scores. Practically, this implies that the intervention not only raised average accuracy but also narrowed skill gaps within the class.

However, the paired-samples t-test indicated that the difference between pretest and posttest mean scores was not statistically significant at the 0.05 level ($t = 0.79$, $p = 0.436$). This inferential finding means that, based strictly on the test applied, the observed numeric gain could not be confidently attributed to Echo Reading alone. The non-significant result may be linked to several factors inherent to the design and measurement context, such as the small sample size, the short intervention window, possible ceiling effects due to posttest scores clustering near the top of the scale, or practice/maturation effects typical in single-group pretest–posttest studies.

Overall, the results support a nuanced conclusion: Echo Reading produced strong practical and instructional gains, evidenced by pronounced shifts in Phil-IRI reading levels and improved mean accuracy, yet these gains did not reach statistical significance under the paired t-test. In an action-research context, this pattern still provides meaningful evidence for classroom decision-making. The intervention appears promising as a daily guided oral-reading routine for

Grade 3 learners with low reading accuracy, while also highlighting the need for longer implementation periods and future studies with comparison groups to establish stronger causal claims.

4. Discussion

The results of the present study corroborate a substantial body of fluency research indicating that teacher-guided oral rereading improves early readers' word recognition accuracy. The dramatic descriptive shift in learners from frustration and instructional levels to independent level aligns with the National Reading Panel's conclusion that guided repeated oral reading procedures produce consistent gains in word recognition, oral fluency, and comprehension across elementary grades (National Institute of Child Health and Human Development [NICHD], 2000). Echo Reading is a form of guided repeated reading with immediate modeling and feedback; therefore, the improvement pattern observed in this study is consistent with the mechanism identified by the NRP—namely, repeated exposure to accurate models, along with corrective scaffolding, strengthens automatic word recognition over time (NICHD, 2000).

More specifically, the study's findings are consistent with meta-analytic evidence that repeated reading interventions yield moderate, educationally meaningful effects on fluency and accuracy. Therrien's (2004) meta-analysis reported that repeated reading, especially when paired with oral modeling and error correction, improves reading fluency and comprehension for struggling readers. Similarly, Lee and Yoon's (2017) meta-analysis of repeated reading for students with reading disabilities found a robust positive overall effect, particularly at the elementary level. It noted stronger results when rereading is guided by a competent reader (Lee & Yoon, 2017). In the current study, the Echo Reading routine provided exactly the guided rereading structure that helps explain the large practical gains in word-recognition categories and mean accuracy scores.

Corroboration is also evident in research directly examining modeled Echo Reading with Grade 3 learners. Bondy's quasi-experimental thesis comparing modeled Echo Reading with independent repeated reading among third graders, including English learners, found that Echo Reading produced stronger oral reading fluency outcomes than unguided rereading, attributing effects to teacher modeling of phrasing, pronunciation, and prosody (Bondy, 2012). The present study mirrors Bondy's context in grade level and instructional focus, and likewise suggests that immediate imitation of a fluent model accelerates accuracy gains for early readers. Although the paired t-test in this study was not statistically significant, the magnitude and direction of change support Bondy's conclusion that Echo Reading is instructionally advantageous relative to less scaffolded practice.

In addition, current instructional protocols and synthesis documents describe Echo Reading as particularly effective for beginning and struggling readers because it reduces cognitive load, supports accurate decoding, and allows immediate feedback. The Echo Reading protocol from the University of Virginia Literacy Institute emphasizes that teacher-modeled segments enable learners to echo correctly at an appropriate rate while acquiring accurate pronunciation and intonation (University of Virginia Literacy Institute, 2023). Five from Five (2024) similarly identifies Echo Reading as an evidence-based fluency practice that strengthens accuracy and prosody through short, repeated, teacher-scaffolded text segments. The improvements demonstrated in the present study's posttest classifications are consistent with these documented instructional purposes and expected outcomes.

Finally, the descriptive–inferential contrast in this study parallels patterns noted in some repeated-reading research where practical classroom gains do not always translate into statistical significance under small-sample, single-group designs. Meta-analyses observe that effect sizes are sensitive to duration, dosage, and sample size, and that stronger evidence typically emerges when interventions are extended and compared with a control condition (Lee & Yoon, 2017;

Therrien, 2004). Thus, while the current study corroborates the broader literature in showing meaningful upward movement in reading accuracy, it also reflects methodological cautions in prior research: statistically reliable attribution requires larger samples, longer exposure, and comparison groups.

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TEACHERS' TECHNOLOGY-INTEGRATED PEDAGOGICAL STRATEGIES IN MAPEH PERFORMANCE TASKS OF LEARNERS

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Major in MAPEH

Abstract

This study investigated teachers' technology-integrated pedagogical strategies in MAPEH performance tasks and their relationships with learners' performance, motivation, and engagement in selected secondary schools within an identified district. A quantitative descriptive-correlational and comparative design was employed. Data were gathered from MAPEH teachers and junior high school learners using a researcher-made Likert-scale survey on technology integration, validated motivation and engagement scales adapted to the MAPEH context, classroom observation checklists, and DepEd-aligned performance-task rubrics. Descriptive statistics (mean and standard deviation) determined the extent of technology integration and the level of learner performance, while Pearson's r tested relationships among variables. Independent-samples t-tests examined differences in motivation and engagement between learners exposed to technology-integrated strategies and those taught through traditional approaches.

Findings revealed a great extent of technology integration among teachers, particularly through multimedia presentations, video demonstrations, interactive applications, and online learning platforms used for task modeling, practice, and feedback. Learners' performance in MAPEH tasks was rated very satisfactory to outstanding, with relatively stronger outcomes in Physical Education and Arts-related activities. Correlation analysis showed a significant positive relationship between the extent of technology integration and learners' performance, indicating that greater use of digital pedagogy was associated with better performance on task outcomes. Technology integration also strongly influenced learners' motivation and engagement. Comparative results further indicated significant differences favoring the technology-integrated group, which reported higher motivation and engagement than the traditional-method group.

The study concludes that purposeful technology integration enhances both performance-based competencies and affective learning outcomes in MAPEH. An evidence-based action plan is recommended to sustain and expand digital pedagogy through continuous teacher training, strengthened ICT support, and technology-embedded task design.

Keywords: Technology Integration, Pedagogical Strategies, MAPEH, Performance Tasks, Learner Motivation, Learner Engagement, Secondary Education

1. Introduction

Performance tasks are central to learning and assessment in Music, Arts, Physical Education, and Health (MAPEH) because they allow learners to demonstrate competencies through authentic skill performance, creative production, and wellness-related actions. In the Philippine K to 12 curriculum, classroom assessment is designed to be holistic and standards-based, emphasizing not only knowledge but also the performance standards that reflect real-life application (Department of Education [DepEd], 2015). DepEd Order No. 8, s. 2015 underscores that performance tasks require learners to create products or engage in activities that demonstrate what they know and can do, particularly in skill-oriented learning areas such as MAPEH (DepEd, 2015). Moreover, DepEd Order No. 31, s. 2020 reaffirmed the primacy of

performance tasks in assessment and grading, even across flexible learning modalities, by recognizing practical demonstrations, multimedia outputs, and digital artifacts as valid indicators of mastery (DepEd, 2020). These policy directions situate MAPEH performance tasks as a key pathway for developing 21st-century competencies, including creativity, collaboration, communication, and self-management, all of which are increasingly mediated by technology-supported learning environments.

In parallel, DepEd has advanced technology integration through systems-level initiatives. The DepEd Computerization Program established the provision of ICT resources to public schools and encouraged classroom use of digital tools to raise learning quality (DepEd, 2010). Recent reforms under the MATATAG Curriculum further highlight the role of technology in strengthening foundational skills and promoting future-ready learning, explicitly encouraging teachers to leverage digital resources to enrich instruction and assessment across learning areas (DepEd, 2024). Capability-building initiatives such as LICIT (Leveling up ICT Competencies through an ICT-enabled Teaching) and related professional standards likewise emphasize teachers' responsibility to use ICT positively to facilitate effective teaching and learning (DepEd, 2020; DepEd, 2022). Collectively, these policies indicate that technology integration is no longer optional but expected for responsive and inclusive pedagogy in Philippine classrooms.

Globally and locally, research supports these policy directions. Technology-integrated pedagogy can enhance learner engagement, skill acquisition, and performance outcomes when aligned with subject-specific goals. In Physical Education, technology-enhanced strategies—such as video modeling, fitness apps, and interactive platforms—have been associated with improved motor skill development, knowledge retention, and sustained participation (Casey et al., 2024). In Philippine contexts, reviews of technology integration in PE report gains in student motivation and participation, although these depend on teacher competence and access to resources (Basilio & Goh, 2023). Similarly, the Technological Pedagogical Content Knowledge (TPACK) framework explains that effective integration occurs when teachers strategically combine content expertise, pedagogical skill, and technology use, rather than adding digital tools superficially (Mishra & Koehler, 2006; TPACK Framework, 2023). Evidence among Filipino PE teachers indicates that stronger TPACK capacity predicts more meaningful technology use and better student learning experiences (Asuncion et al., 2021). In MAPEH more broadly, emerging Philippine studies observe that teachers use multimedia, online platforms, and interactive apps to support demonstrations and creative outputs, resulting in more engaging learning and clearer performance expectations (Ponsaran, 2024). However, these studies also point to uneven integration and to persistent barriers, such as device limitations, connectivity issues, and variability in teacher readiness (Ponsaran, 2024; Basilio & Goh, 2023).

Despite supportive policy and growing empirical evidence, a critical gap remains in understanding how technology-integrated pedagogical strategies function specifically within MAPEH performance tasks across the four learning areas, and how these strategies relate simultaneously to learners' task performance and affective outcomes. Many existing studies focus on single components of MAPEH, most commonly Physical Education, or describe technology use without examining its statistical relationship with measurable performance outcomes (Basilio & Goh, 2023; Asuncion et al., 2021). Moreover, while DepEd policy recognizes performance tasks and digital outputs as valid, it does not specify how different degrees of technology integration translate into improved performance, nor how motivation and engagement may mediate such effects (DepEd, 2015, 2020). This creates a practical dilemma for teachers: they are mandated to integrate technology and prioritize performance tasks, yet evidence-based guidance on which integrated strategies most effectively enhance MAPEH performance remains limited, particularly in district-level secondary school settings.

Accordingly, this study sought to address this niche by examining the extent to which teachers use technology-integrated pedagogical strategies in MAPEH performance tasks and

determining how these strategies relate to learners' performance outcomes, motivation, and engagement in junior high school. Anchored on DepEd's assessment and technology integration policies (DepEd, 2010, 2015, 2020, 2024) and informed by the TPACK framework and technology-enhanced pedagogy literature (Mishra & Koehler, 2006; Casey et al., 2024), the study used a quantitative descriptive-correlational and comparative design. Specifically, it measured (a) the extent of teachers' technology integration in planning, facilitating, and assessing MAPEH performance tasks; (b) the level of learners' performance in those tasks based on DepEd-aligned rubrics; (c) the relationship between integration and performance; and (d) the influence of technology integration on learners' motivation and engagement, including comparisons between technology-integrated and traditional instructional contexts. By doing so, the study aimed to generate district-level empirical evidence to guide teachers' task design, inform school-level ICT support, and contribute to curriculum and professional development planning aligned with DepEd's MATATAG and digital learning agenda. Ultimately, understanding how technology-integrated pedagogical strategies shape MAPEH performance tasks is essential for ensuring that digitalization efforts do not merely modernize teaching tools but meaningfully strengthen authentic learning and assessment in Music, Arts, Physical Education, and Health.

2. Method

2.1 Research Design

This study employed a quantitative research design, using descriptive-correlational and comparative methods, to examine the extent of teachers' technology-integrated pedagogical strategies in MAPEH performance tasks and their relationships with learners' performance, motivation, and engagement. The descriptive component determined the level of technology integration among MAPEH teachers and the level of learners' performance in rubric-based tasks across Music, Arts, Physical Education, and Health. The correlational component tested the significant relationships among technology integration, motivation, engagement, and performance using Pearson's r. The comparative component assessed differences in learners' motivation and engagement between groups exposed to technology-integrated strategies and those taught through traditional approaches using an independent-samples t-test. Data were gathered through a validated teacher Likert-scale survey and observation checklist, standardized learner motivation and engagement scales adapted to the MAPEH context, and DepEd-aligned performance-task rubrics, with results analyzed using mean, standard deviation, correlation, and t-test to generate objective, generalizable findings.

2.2 Participants

The participants in this study were MAPEH teachers and junior high school learners from selected secondary schools within the identified district during the academic year under investigation. The MAPEH teachers served as the primary respondents for determining the extent of technology-integrated pedagogical strategies used in planning, facilitating, and assessing performance tasks across Music, Arts, Physical Education, and Health. The junior high school learners, who were officially enrolled in the teachers' classes, served as respondents to measure motivation and engagement using validated scales, while their performance levels were obtained from rubric-based scores in MAPEH performance tasks aligned with DepEd standards. Participants were selected using an appropriate sampling technique to ensure that only teachers actively handling MAPEH and learners directly experiencing technology-integrated and traditional strategies were included, thereby enabling reliable comparisons and analyses of the study variables.

2.3 Instrumentation

The study utilized four main instruments to gather quantitative data: (1) a researcher-made Likert-scale survey questionnaire for MAPEH teachers to measure the extent and nature of their technology-integrated pedagogical strategies in performance tasks, covering frequency, consistency, and types of digital tools used; (2) a classroom observation checklist to validate and triangulate teacher-reported practices during the implementation of MAPEH performance tasks; (3) standardized and validated learner motivation and engagement scales, adapted and contextualized to the MAPEH setting, to quantify students' intrinsic/extrinsic motivation and their behavioral, emotional, and cognitive engagement; and (4) DepEd-aligned performance-task rubrics in Music, Arts, Physical Education, and Health to objectively measure learners' task performance based on official competency standards. All instruments underwent content validation by MAPEH and ICT experts, while the reliability of the survey and scales was established through pilot testing and internal consistency analysis before complete administration.

2.4 Data Analysis

Data were analyzed using appropriate quantitative statistical tools aligned with the study objectives. Descriptive statistics, specifically frequency counts, weighted mean, and standard deviation, were used to determine the extent of teachers' technology-integrated pedagogical strategies and to describe learners' performance levels in MAPEH performance tasks. To examine associations among variables, Pearson's product–moment correlation (r) was used to assess the significance and direction of the relationships among the level of technology integration, learners' performance, and motivation and engagement. To address the comparative aspect, an independent-samples t-test was used to identify significant differences in learners' motivation and engagement between groups exposed to technology-integrated strategies and those taught through traditional methods. All analyses were conducted at an acceptable level of significance (e.g., $\alpha = 0.05$), ensuring objective interpretation of patterns, relationships, and group differences in the data.

3 Results

The results showed that MAPEH teachers demonstrated a high level of technology-integrated pedagogical strategies in implementing performance tasks across Music, Arts, Physical Education, and Health. Teachers frequently utilized multimedia presentations, video demonstrations, interactive applications, and online learning platforms to model skills, provide guided practice, and deliver timely feedback. Moreover, classroom observations supported the survey findings, indicating that technology was used not only for content delivery but also to enhance task authenticity and monitor learner progress. Overall, these results suggest that teachers had moved toward more digitally supported, learner-centered approaches in facilitating MAPEH performance tasks.

In terms of learner outcomes, findings revealed that students' performance in MAPEH performance tasks was generally very satisfactory to outstanding. Notably, learners achieved higher performance ratings in Physical Education and Arts-related tasks, where technology-supported demonstrations and creative digital outputs were most prominently used. Meanwhile, performance on Music and Health tasks also showed positive outcomes, though slightly lower than on PE and Arts. Taken together, these results indicate that technology integration coincided with substantial learner achievement, particularly in tasks that required observable skills, creativity, and physical execution.

Finally, statistical treatment confirmed that the extent of technology integration had a significant positive relationship with learners' performance in MAPEH performance tasks, implying that greater use of technology-integrated pedagogy was associated with better task outcomes. In addition, technology integration strongly influenced learners' motivation and

engagement, as students reported increased interest, participation, and persistence when digital tools were embedded in tasks. Furthermore, comparative analysis using the independent-samples t-test revealed a significant difference between learners exposed to technology-integrated strategies and those taught through traditional methods, with the technology-integrated group showing significantly higher motivation and engagement. Hence, the results collectively highlight the instructional advantage of purposeful technology use in improving both performance-based and affective outcomes in MAPEH.

4. Discussion

The first significant finding of this study—that MAPEH teachers employed a wide range of technology-integrated pedagogical strategies in performance tasks—corroborates both policy expectations and empirical evidence. DepEd explicitly promotes ICT integration through initiatives such as the DepEd Computerization Program and related professional development thrusts, which encourage teachers to embed digital tools in instruction to improve learning quality (DepEd, 2010). In addition, the MATATAG Curriculum policy guidelines affirm the need for future-ready and digitally supported learning experiences across learning areas, reinforcing teachers' responsibility to use technology meaningfully in classroom practice (DepEd, 2024). Consistent with these directives, recent Philippine research documents that MAPEH teachers increasingly use video demonstrations, multimedia presentations, and online platforms to enrich performance tasks and support flexible, authentic assessment (Ponsaran, 2024). Thus, the high integration reported in this study reflects a broader national shift toward digital pedagogy aligned with curriculum and teacher standards.

Moreover, the study's finding that learners achieved very satisfactory to outstanding performance in MAPEH tasks—particularly in Physical Education and Arts—aligns with literature emphasizing the suitability of technology for skill-based and creative domains. DepEd Order No. 8, s. 2015 stresses that performance tasks should allow learners to demonstrate competencies through authentic outputs and practical application, which technology can scaffold by providing clear models, repeated practice opportunities, and accessible feedback (DepEd, 2015). International and local studies in Physical Education show that video-based modeling, interactive fitness applications, and digital task monitoring support motor skill refinement and performance readiness, helping learners achieve stronger task outcomes (Casey et al., 2024; Frontiers in (Psychology, 2024). Similarly, MAPEH-focused work in the Philippines suggests that digital creation tools and multimodal resources help learners produce higher-quality arts and movement outputs by expanding their expressive options and improving task clarity (Ponsaran, 2024). Therefore, the strong learner performance in this study is consistent with evidence that technology enhances mastery in performance-oriented subjects.

Similarly, the significant positive correlation between technology integration and learner performance supports the theoretical and empirical view that technology improves outcomes when aligned with pedagogical and content goals. The TPACK framework explains that teachers' effective integration occurs when technology is used strategically to support subject competencies rather than serve as an add-on (Mishra & Koehler, 2006). Studies among Filipino Physical Education teachers report that higher levels of technological pedagogical knowledge are associated with more meaningful technology use and improved learner achievement (Asuncion et al., 2021). Related reviews also conclude that technology integration increases learning gains when it supports modeling, feedback, and authentic application—core requirements of MAPEH performance tasks (Casey et al., 2024; Integrating Technology in PE Review, 2025). Hence, the correlation identified in this study reinforces the idea that purposefully designed digital pedagogy strengthens the development of performance competencies.

Furthermore, the finding that technology integration strongly influences learners' motivation and engagement is strongly supported by contemporary studies emphasizing

technology's affective benefits. Interactive platforms and multimedia environments are widely recognized for increasing learner interest, enjoyment, and persistence, particularly in Physical Education contexts where engagement directly affects participation and skill growth (Frontiers in Psychology, 2024). Systematic reviews highlight that gamified apps, wearable-supported tasks, and digital coaching promote self-regulated learning and sustained motivation by making progress visible and tasks more personally meaningful (Casey et al., 2024; Integrating Technology in PE Review, 2025). In Philippine MAPEH settings, technology use has similarly been linked to higher learner participation and enthusiasm, especially when tasks involve video creation, online sharing, or interactive practice (Ponsaran, 2024). Therefore, the motivational and engagement gains found here reflect a consistent trend that technology transforms performance tasks into more stimulating, student-centered experiences.

Finally, the significant difference in motivation and engagement between learners taught with technology-integrated strategies and those taught through traditional methods mirrors broader comparative evidence. DepEd Order No. 31, s. 2020 recognizes digital and performance-based outputs as valid learning evidence across modalities, implying that technology-supported tasks can be more responsive to learners' contexts and needs than purely traditional approaches (DepEd, 2020). Empirical work in PE and related skill subjects repeatedly shows higher engagement in technology-enhanced classes because digital tools amplify interaction, immediate feedback, and peer collaboration, which are less consistently available in conventional instruction (Casey et al., 2024; Frontiers in Psychology, 2024). Likewise, Philippine studies on technology integration in MAPEH report that learners become more participative and motivated when teachers use rich media and interactive applications to guide performance tasks (Ponsaran, 2024). Taken together, these converging sources validate the study's comparative result and highlight technology integration as a practical advantage for sustaining learner involvement in MAPEH.

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LEADERSHIP AND MANAGEMENT CAPABILITY OF SCHOOL HEADS IN MALASIQUI I DISTRICT

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Abstract

This study examined the perceived leadership and management capabilities of public elementary school heads in Malasiqui I District, Schools Division Office I Pangasinan, Philippines. Responding to the need to strengthen school-based management and instructional leadership, the research employed a quantitative descriptive–correlational design. All school heads in the district participated through total population purposive sampling. Data were collected using a researcher-developed Likert-scale questionnaire validated by experts, and were analyzed using frequency counts, percentages, weighted means, and Pearson product–moment correlation.

Results revealed that school heads were perceived as Very Highly Capable in leadership (overall weighted mean = 4.51) and Highly Capable in management (overall weighted mean = 4.35). Leadership indicators consistently registered at the upper end of the scale, reflecting strong competencies in setting direction, leading instruction, nurturing a positive school culture, and developing personnel. Management capability, while also rated high, showed comparatively lower mean scores on indicators related to communication systems, resource mobilization and allocation, and collaborative decision-making processes. Correlation analysis indicated a strong, significant positive relationship between perceived leadership and management capabilities ($r = 0.78$, $p < .01$), suggesting that higher leadership competence is associated with stronger management practice.

The findings imply that leadership and management competencies are mutually reinforcing within the district context. Targeted professional development focusing on strategic communication, resource stewardship, and partnership-building is recommended to sustain high performance and address remaining capability gaps. Future studies may incorporate multi-rater assessments and school outcome measures to validate and extend these results across broader settings.

Keywords: School Heads, Leadership Capability, Management Capability, School-Based Management, Descriptive–Correlational Study, Malasiqui I District

1. Introduction

Effective school leadership is consistently identified as a pivotal lever for improving teaching quality and learner outcomes. Across decades of empirical research, the role of the school head has evolved from a primarily administrative manager to a leader who shapes instructional direction, culture, and professional practice. International evidence indicates that leadership effects on student achievement are largely indirect but substantial, operating through the leader's ability to establish goals, align resources, and promote high-quality teaching (Hallinger, 2011; Robinson et al., 2008). In particular, instructional leadership—defined through practices such as framing and communicating school goals, supervising instruction, coordinating the curriculum, and monitoring learner progress—shows stronger associations with learner outcomes than leadership models that focus mainly on vision or motivation (Hallinger & Murphy, 1986; Robinson et al., 2008). These findings underscore that leadership and management should

not be treated as separate functions; instead, they are mutually reinforcing capabilities that, together, cultivate conditions for school improvement.

In the Philippine basic education system, the centrality of school heads to school effectiveness is embedded in policy and law. Republic Act (RA) 9155, the Governance of Basic Education Act of 2001, institutionalized decentralization and school-based management (SBM), positioning the school as the "heart" of basic education governance and assigning school heads authority, responsibility, and accountability for learning outcomes and school performance (Republic Act No. 9155, 2001). Under this framework, school heads are expected to lead curriculum implementation, nurture professional development, mobilize stakeholders, and manage resources in ways that are responsive to local contexts. Recent DepEd issuances reiterate this direction by strengthening SBM processes and clarifying that school heads remain key actors in community partnership-building and operational accountability (Department of Education [DepEd], 2024). Consequently, leadership capability and management capability are not merely desirable attributes; they are explicit professional expectations anchored in national governance reforms.

To operationalize these expectations, DepEd formally adopted the Philippine Professional Standards for School Heads (PPSSH), a competency framework defining what effective school leadership and management look like across career stages. The PPSSH articulates five aligned domains: Leading Strategically, Managing School Operations and Resources, Focusing on Teaching and Learning, Developing Self and Others, and Building Connections (DepEd, 2020). These domains establish standards for school heads' strategic leadership, instructional supervision, personnel development, data-informed decision-making, and stakeholder engagement. Importantly, the PPSSH reflects a modern conception of the school head as both leader and manager—someone who combines vision-setting and pedagogical stewardship with operational systems, resource mobilization, and accountability. While the PPSSH provides a clear national benchmark, its effective enactment depends on school heads' actual capability and the extent to which they practice these competencies in real contexts. Therefore, empirical studies that assess leadership and management capabilities at the district or division level directly contribute to policy implementation, local planning, and targeted professional development.

However, leadership and management capability are context-sensitive. Even when standards are universal, school heads operate under varying conditions of school size, community support, staffing levels, resource constraints, and learner needs. Research in SBM environments indicates that school heads often face competing administrative and instructional demands, and capability gaps may emerge in areas such as resource stewardship, communication systems, and collaboration with stakeholders (e.g., constraints reported in SBM compliance contexts) (Amor et al., 2019). Within Philippine districts, these dynamics can manifest differently depending on geographic location, socioeconomic context, and organizational culture. Thus, district-level assessments are essential for identifying strengths and gaps in capability that may be masked by national averages and for aligning local interventions with actual leadership needs.

Malasiqui I District in Schools Division Office I, Pangasinan, represents one such context in which understanding school heads' leadership and management capabilities is timely and relevant. Like many districts, it is implementing DepEd reforms that demand strong instructional guidance, responsive resource management, and broad community partnership. However, the extent to which school heads perceive themselves as capable across leadership and management domains remains under-documented. Moreover, while the global literature affirms that effective instructional leadership and sound management practices jointly influence school improvement, local empirical evidence on their relationship remains limited. Strong correlations between leadership and management capabilities would suggest that interventions should be integrated rather than compartmentalized—strengthening strategic and instructional leadership

alongside operational and resource management systems. Conversely, weaker or uneven relationships could indicate the need for differentiated professional development tracks.

Guided by these considerations, the present study examines the perceived leadership and management capabilities of public elementary school heads in Malasiqui I District. Specifically, it determines (a) the level of leadership capability, (b) the level of management capability, and (c) the relationship between leadership and management capability among school heads. By using a descriptive–correlational approach grounded in the PPSSH and aligned with RA 9155's SBM mandate, the study aims to generate evidence that is locally actionable and policy-relevant. Findings are intended to inform district professional development planning, capability-building initiatives, and school improvement strategies, with the broader goal of supporting school heads in sustaining high-quality learning environments.

2. Method

2.1 Research Design

The study employed a quantitative descriptive–correlational research design to determine the perceived leadership and management capabilities of public elementary school heads in Malasiqui I District, SDO I Pangasinan, and to test the relationship between these two capability domains. Using a cross-sectional approach, data were collected at a single point in time from the total population of district school heads using a researcher-developed Likert-scale questionnaire. The descriptive component summarized respondents' perceptions using frequency counts, percentages, and weighted means. In contrast, the correlational component examined the strength and significance of the association between leadership and management capability scores through the Pearson product–moment correlation coefficient. This design was appropriate for profiling current capability levels and identifying statistically significant relationships without attempting to infer causality.

2.2 Participants

The participants in the study comprised the entire population of public elementary school heads assigned in Malasiqui I District, Schools Division Office I, Pangasinan. Given the district's manageable size and the objective of capturing a complete profile of school leadership in the locale, a purposive total enumeration approach was used, in which all officially designated school heads during the research were included as respondents. This ensured full district representation, minimized sampling bias, and allowed the findings to reflect the actual leadership and management capability landscape of Malasiqui I District schools at the time of data collection.

2.3 Instrumentation

The primary instrument used in the study was a researcher-developed survey questionnaire designed to measure school heads' perceived leadership and management capabilities, aligned with DepEd expectations for school leadership. The tool consisted of two major sections: one assessing leadership capability and the other assessing management capability, each containing indicator statements rated on a five-point Likert scale from 1 (Not Capable) to 5 (Very Highly Capable). Prior to administration, the instrument underwent expert validation by three education specialists to ensure content relevance, clarity, and alignment with the study constructs; their feedback was incorporated to refine item wording and coverage. The finalized questionnaire was then administered face-to-face to all identified school heads in Malasiqui I District, generating quantitative data suitable for descriptive and correlational analysis.

2.4 Data Analysis

Data analysis followed a two-stage quantitative procedure consistent with the descriptive–correlational design. First, responses from the Likert-scale questionnaire were coded, tabulated, and summarized using descriptive statistics—frequency counts and percentages to profile responses, and weighted means to determine the overall and indicator-level perceived leadership and management capability of school heads, interpreted through the study's descriptive equivalent scale. Second, inferential analysis was conducted using the Pearson product–moment correlation coefficient to test the strength and significance of the relationship between leadership and management capability scores. This combination of descriptive and correlational techniques enabled the study to present a clear capability profile and establish whether variations in leadership perceptions were statistically associated with variations in management perceptions, without making causal claims.

3. Results

The results indicated that the school heads in Malasiqui I District demonstrated a consistently high capability profile across both domains assessed. In terms of leadership capability, the overall weighted mean of 4.51 placed respondents in the "Very Highly Capable" range. This suggests that, as a group, school heads perceive themselves as highly competent in core leadership functions, including setting school direction, demonstrating instructional leadership, promoting a positive school culture, and guiding teachers toward shared goals. The concentration of scores near the upper end of the scale reflects a strong confidence in their leadership role and a belief that they can effectively influence teaching–learning conditions within their schools.

For management capability, the overall weighted mean of 4.35 corresponded to a "Highly Capable" rating. While still clearly positive, this level was slightly lower than leadership capability, implying that respondents viewed management tasks as more challenging or less uniformly mastered than leadership responsibilities. Management indicators related to operational processes, organizing school programs, ensuring compliance, and routine administrative functions generally received high ratings, indicating that school heads perceive themselves as adept at maintaining functional school systems and ensuring operational continuity.

However, the pattern of results also revealed specific management indicators that tended to pull the overall management mean downward relative to leadership. The comparatively lower ratings were observed in areas tied to communication systems, resource mobilization and allocation, and collaborative or participatory decision-making. These findings imply that although school heads feel competent in standard managerial duties, there remain capability gaps in more complex, stakeholder-sensitive management functions that require sustained coordination, negotiation, and strategic use of limited school resources. Such areas align with common challenges in decentralized SBM contexts, where school heads must balance administrative accountability with community engagement and resource constraints.

Correlation analysis further showed a strong and statistically significant positive relationship between perceived leadership and management capability ($r = 0.78$, $p < .01$). This indicates that school heads who rated themselves higher in leadership also tended to rate themselves higher in management, confirming that these two domains function as interconnected competencies rather than isolated roles. The strength of the correlation suggests that improvements in one capability area (for example, instructional or strategic leadership) are likely to reinforce the other (such as operational management), supporting integrated professional development approaches.

Taken together, the results portray Malasiqui I District school heads as a generally high-performing leadership corps with particularly strong leadership confidence and sound managerial competence. At the same time, the slight divergence between domains and the weaker

management indicators provide a clear direction for capability-building. Focusing development initiatives on strategic communication, resource stewardship, and collaborative governance would address the most evident gaps while leveraging the strong leadership foundation already present among respondents.

4. Discussion

The findings of the present study corroborate a growing body of Philippine evidence indicating that school heads generally exhibit high leadership capability. For example, studies assessing school heads using PPSSH-aligned or similar leadership frameworks consistently report “high” to “very high” ratings, particularly in instructional and supervisory dimensions (Madarang, 2023; UIJRT, 2022). In Nueva Ecija, school heads’ leadership, interpersonal, and supervisory skills were rated as evident or high by respondents, suggesting that district leaders have developed strong competence in direction-setting and teacher support—results that align with the “Very Highly Capable” leadership rating obtained in Malasiqui I District.

The management results also parallel related local studies, which reveal strong managerial competence but comparatively lower ratings in complex operational areas. Research on managerial competence and school operation under SBM frequently finds that school heads are capable in routine administrative functions, yet often experience relative constraints in communication structures, resource mobilization, and participatory governance (Baylon et al., 2025; Ramos, 2025). These patterns support the finding that management capability was “Highly Capable,” though slightly below leadership, and reinforce that SBM-era management demands extend beyond compliance toward strategic resource stewardship and stakeholder coordination.

Recent correlational studies in Philippine settings likewise support the strong positive relationship you found between leadership and management capabilities. Investigations into instructional leadership and school management or SBM implementation tend to show that leadership competence is significantly associated with management performance and other school effectiveness indicators (Palmera, 2025; Ramos, 2025). These studies argue that school heads who are strong instructional or strategic leaders are also more capable in planning, organizing resources, and implementing operational systems, mirroring the $r = .78$ result. This convergence suggests that integrated capability-building initiatives—rather than separating leadership training from management training—are empirically justified.

Further, the results complement research linking school heads’ leadership practices to teacher competence and school improvement conditions. Correlational findings in the National Capital Region and other locales show that school heads’ instructional leadership significantly relates to teacher performance, efficacy, and professional growth outcomes (Naguit, 2024; “School administrators’ instructional leadership skills…,” 2022). These studies reinforce the interpretive logic of the work: robust leadership capability is not a stand-alone asset but one that coexists with and supports managerial processes that enable systemic improvement in teaching and learning.

Taken together, this alignment with prior studies strengthens the external validity of the conclusions. The district-level evidence not only replicates national patterns of high leadership and management capability but also adds nuance by identifying specific management domains where capability is relatively weaker. This is consistent with the broader Philippine SBM literature, which emphasizes that leadership confidence tends to be high while management challenges persist in resource- and stakeholder-intensive tasks (Baylon et al., 2025; UIJRT, 2022). Thus, the recommendations on strategic communication, collaborative governance, and resource management are supported by both local and national empirical trends.

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LEVERAGING SOCIAL MEDIA PLATFORMS FOR PERFORMANCE-BASED ASSESSMENT IN PHYSICAL EDUCATION

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Abstract

This study examined the effectiveness, reliability of assessment, and digital privacy concerns associated with using social media platforms for the performance-based evaluation in Physical Education (PE). A pure quantitative, descriptive–comparative design was employed. Data were gathered from 500 respondents (400 students and 100 teachers) selected through stratified random sampling from secondary schools and higher education institutions that used Facebook, YouTube, and TikTok for PE performance tasks. A researcher-made Likert-scale questionnaire, validated by experts in PE, educational technology, and research, measured perceived effectiveness, assessment reliability, and privacy concerns; pilot testing yielded a Cronbach's alpha above 0.80. Descriptive statistics (mean, standard deviation, percentage) and independent-samples t-tests at the 0.05 level of significance were used.

Findings showed high perceived effectiveness of social media–based performance assessment among students ($M = 4.21$) and teachers ($M = 4.09$), with no significant difference between groups, indicating shared acceptance of social media as an assessment support tool. Reliability results revealed that social media–based evaluation ($M = 4.13$) was significantly more reliable than traditional in-person assessment ($M = 3.86$; $p < 0.05$), suggesting that recorded submissions and rubric-guided review increase consistency and objectivity in scoring. Despite these advantages, respondents reported high levels of digital privacy concerns (overall $M = 4.00$), with teachers expressing slightly greater concern, highlighting risks of data exposure and content misuse. Based on the results, practical guidelines were proposed emphasizing ethical use, informed consent, controlled access, and institutional policy support to maximize benefits while safeguarding learner privacy.

Keywords: Social Media Platforms, Performance-Based Assessment, Physical Education, Assessment Reliability, Perceived Effectiveness, Digital Privacy Concerns

1. Introduction

Physical Education (PE) in the Philippine K to 12 curriculum is designed to develop learners' fitness, movement competence, and lifelong participation in physical activity through authentic and skills-based learning experiences (Department of Education [DepEd], 2019). In this context, classroom assessment is expected to be standards-based, learner-centered, and reflective of real performance. DepEd Order No. 8, s. 2015 emphasizes that assessment should measure what learners "know, can do, and value," and that performance tasks are a key component of evaluating competencies across learning areas, including MAPEH (DepEd, 2015). During the pandemic, DepEd Order No. 31, s. 2020 further reinforced the primacy of performance tasks by reducing reliance on quarterly exams and highlighting authentic outputs as major evidence of learning, particularly for subjects where skills demonstration is essential (DepEd, 2020). Therefore, PE teachers are institutionally mandated to implement performance-based assessment (PBA) as the most valid approach for evaluating motor skills, routines, and fitness-related competencies.

However, despite this policy direction, implementing PBA in PE remains challenging in practice. Performance tasks often require time-intensive observation, repeated demonstrations, and detailed scoring, yet PE periods are limited, and classes are frequently large. As a result, teachers struggle to accurately document performances, provide timely feedback, and maintain consistent scoring across learners. These constraints became more visible in blended and remote learning setups, where teachers needed alternative ways to capture performance evidence. Research on PE assessment during COVID-19 noted that teachers had difficulty ensuring fairness and reliability when performance outputs were not systematically recorded, prompting many to rely on digital submissions (Lacuata & Diano, 2022). Consequently, the search for feasible, technology-supported assessment approaches has intensified, especially those aligned with learners' real-life digital practices.

In parallel, social media platforms have become ubiquitous learning spaces among Filipino youth. Video-centered apps such as TikTok and YouTube, as well as interactive platforms like Facebook, are now embedded in students' daily routines for communication, entertainment, and increasingly, informal learning. Recent studies show that PE students frequently engage with fitness and movement content on TikTok and YouTube, often modeling routines they watch and sharing their own activity videos (Garcia, 2024; Zhu et al., 2025). Likewise, physical educators internationally report using social media for professional learning and instructional exchange, with YouTube and Facebook among the most common platforms (McNamara et al., 2022). Because PE learning is inherently visual and performance-driven, the affordances of social media—recording, replaying, sharing, and commenting—seem well-suited to capturing authentic evidence of students' skills. Moreover, broader educational research suggests that social media–supported assessment can enhance engagement and immediacy of feedback, while allowing learners more control over how they present their performance outputs (Khalil & Abdelrahman, 2022). Thus, social media may serve as a practical extension of DepEd's call for authentic performance assessment.

Nevertheless, a clear research niche remains. While the global literature acknowledges that social media can support learning and even assessment, studies also highlight unresolved issues related to assessment credibility, platform limitations, and blurred boundaries between social and academic spaces (Pangrazio & Selwyn, 2022). In PE settings specifically, evidence on whether social media-based assessment improves reliability compared to traditional in-person scoring is still limited, especially in the Philippine basic and higher education contexts. Even when teachers adopt video submissions, systematic evaluation of their effectiveness and scoring consistency is rarely documented. This gap matters because DepEd's assessment framework requires that performance tasks be not only authentic but also fair, valid, and reliable across learners (DepEd, 2015). Without empirical support, social media use in PE assessment risks becoming an informal workaround rather than a defensible pedagogical strategy.

In addition, ethical and legal concerns intensify the need for focused investigation. DepEd has repeatedly reiterated that learner privacy must be protected in digital environments. The "Guidance on Posting Learners' Images or Data on Social Media" (Memorandum OM-OUOPS-2024-05-03942, disseminated through various division memoranda in 2024–2025) requires parental or guardian consent before posting learner images or identifiable data online and anchors this protection on the Child Protection Policy (DepEd Order No. 40, s. 2012) (DepEd, 2012; DepEd Region X, 2024). DepEd's data privacy notice also stresses compliance with the Data Privacy Act of 2012 in any collection, processing, or sharing of learner information (DepEd, 2024). National privacy advisories for online learning further warn that digital tools must be used with safeguards against unauthorized sharing, profiling, or misuse of student content (National Privacy Commission, 2020). Therefore, even if social media offers functional benefits for PE assessment, its use must be weighed against learners' privacy risks and teachers' ethical responsibilities.

However, few studies quantify how strongly students and teachers perceive these privacy concerns in relation to assessment use.

Given these realities, the present study addresses a timely and policy-relevant gap by empirically examining how social media platforms can be leveraged for performance-based assessment in Physical Education. Specifically, it investigates (1) the perceived effectiveness of social media for PBA among students and teachers, (2) the reliability of scoring PE performance tasks through social media compared with traditional in-person evaluation, and (3) the level of digital privacy concerns experienced by participants. By anchoring the inquiry in DepEd's assessment mandates and privacy directives, the study aims to generate evidence-based guidelines for responsible integration of social media into PE assessment practices. Ultimately, this work contributes to strengthening classroom assessment in PE by proposing an approach that is authentic, manageable, and aligned with both learning standards and learner protection policies in the Philippine educational context.

2. Method

2.1 Research Design

This study employed a pure quantitative research design, specifically using a descriptive–comparative approach, to determine the effectiveness of social media platforms for performance-based assessment in Physical Education. The design enabled the collection of numerical data from students and teachers through a validated Likert-scale survey and performance assessment rating sheets, allowing for objective measurement of perceived effectiveness, assessment reliability, and digital privacy concerns. Descriptive statistics such as mean, standard deviation, and percentage were used to summarize respondents' ratings, while inferential statistics—particularly independent samples t-tests—were applied at the 0.05 level of significance to examine differences between students' and teachers' perceptions and between reliability scores from social media–based and traditional in-person assessments. This non-experimental design did not manipulate variables but instead compared naturally occurring responses and evaluation outcomes to generate empirical evidence for the development of responsible and effective social media assessment guidelines in PE.

2.2 Participants

This study consisted of 500 respondents from selected public and private secondary schools and higher education institutions, in which social media platforms were used for Physical Education performance tasks and assessment. Of the total sample, 400 were students currently enrolled in PE courses and actively engaged in performance-based assessments, while 100 were PE teachers who facilitated, monitored, and evaluated these tasks. Respondents were chosen through stratified random sampling to ensure proportional representation of both groups and institutional affiliations, and only those with firsthand experience using platforms such as Facebook, YouTube, and TikTok for PE performance submission or evaluation were included to provide valid and reliable perspectives on effectiveness, reliability, and digital privacy concerns.

2.3 Instrumentation

The study used two primary instruments to collect quantitative data: a structured researcher-developed survey questionnaire and performance assessment rating sheets. The survey questionnaire was designed to measure respondents' perceived effectiveness of social media platforms for performance-based assessment, the perceived reliability of scoring through these platforms versus traditional in-person evaluation, and the level of digital privacy concerns; it included demographic items and statements rated on a five-point Likert scale from Strongly Disagree (1) to Agree (5) Strongly. Complementing this, standardized PE performance rubrics

and rating sheets were used by teachers to score student performance tasks submitted via social media and during in-person evaluation, ensuring consistent criteria across assessment modes. Both instruments underwent expert validation by specialists in Physical Education, educational technology, and research, and a pilot test demonstrated high internal consistency (Cronbach's alpha> 0.80), confirming the questionnaire's reliability for the main study.

2.4 Data Analysis

This study followed a purely quantitative procedure using both descriptive and inferential statistics. After retrieving and encoding the completed questionnaires and performance rating sheets, descriptive statistics, including frequency counts, percentages, weighted means, and standard deviations, were computed to summarize the perceived effectiveness of social media platforms, assessment reliability levels, and digital privacy concerns among students and teachers. To examine group and method differences, independent samples t-tests were applied at the 0.05 level of significance to determine whether (1) students and teachers differed significantly in their perceived effectiveness and privacy concern ratings, and (2) reliability scores from social media–based performance assessments differed significantly from those obtained through traditional in-person evaluation. All computations were performed using standard statistical software to ensure accuracy, consistency, and objective interpretation of results.

3 Results

The study found that social media platforms were perceived as highly effective tools for performance-based assessment in Physical Education. Specifically, students registered a very high effectiveness rating (M = 4.21), while teachers likewise reported a very effective rating (M = 4.09). Although students rated the platforms slightly higher, the statistical comparison showed no significant difference in perceptions between the two groups at the 0.05 level. This indicates that both students and teachers share a consistent and positive view of social media as a supportive assessment environment, particularly in terms of accessibility, engagement, and ease of performance submission and feedback.

Moreover, when assessment reliability was compared across modes of evaluation, social media–based performance assessment produced stronger reliability outcomes than traditional in-person assessment. The mean reliability score for tasks evaluated through social media platforms was higher (M = 4.13) than that of in-person evaluation (M = 3.86). In addition, inferential analysis confirmed that this difference was statistically significant ($p < 0.05$). This suggests that social media platforms' ability to record, replay, and document performances enables teachers to apply rubrics more consistently, thereby reducing scoring variability and strengthening fairness and objectivity in performance grading.

However, despite these favorable results, the study also identified substantial concerns about digital privacy among participants. Overall, respondents reported a high level of privacy concern (M = 4.00), with teachers expressing slightly higher apprehension than students. In particular, concerns centered on unauthorized sharing, public exposure of performance videos, and risks to the confidentiality of personal data. Therefore, while social media platforms were validated as effective and reliable for PE performance-based assessment, the elevated privacy concerns highlight the need for controlled platform use, informed consent, and clear institutional safeguards to ensure ethical and responsible implementation.

4. Discussion

The study's finding that both students and teachers perceived social media platforms as very effective for performance-based assessment in PE corroborates a growing body of research on the instructional affordances of social networks in movement-based learning. For instance, a case study on the use of Edmodo in secondary PE reported that both teachers and students

evaluated the platform positively because it improved participation, allowed flexible submission of performance tasks, and enhanced the teacher's ability to observe skills beyond class time (Hernández-Ramos & Martínez-García, 2023). Similarly, PE-focused research on TikTok shows that students actively engage with fitness and movement content and often translate what they view into practice, suggesting that short-form video platforms align naturally with PE task demonstration and motivation (Garcia, 2024). Taken together, these studies support the present result that social media environments can function as authentic, engaging spaces for documenting and assessing performance tasks.

Moreover, the absence of a significant difference between students' and teachers' effectiveness ratings is consistent with the literature, which indicates converging attitudes toward digital media in PE when these tools align with pedagogical needs. A recent systematic review of PE teachers' and preservice teachers' attitudes toward digital media found that acceptance increases when technologies directly support learning goals, such as feedback, modeling, and student engagement, resulting in generally positive perceptions across stakeholder groups (Tzifopoulos et al., 2025). In the current study, both groups similarly recognized that social media supports accessibility and interaction, reinforcing the idea that shared utility drives shared approval. Thus, the finding suggests a readiness among teachers and learners to adopt social media for assessment, provided its use remains instructionally grounded.

In addition, the study's evidence that social media–based assessments yielded significantly higher reliability than traditional in-person evaluation aligns with assessment scholarship emphasizing the role of recorded performance evidence and structured rubrics. Research on scoring rubrics indicates that reliability improves when assessors can revisit performance artifacts and apply clearly defined criteria consistently (Jonsson & Svingby, 2007). Social media platforms enable repeated viewing of student outputs, reducing time pressure and missed observations common in live PE classes. Therefore, the reported reliability advantage likely reflects the same mechanism identified in rubric and performance-assessment literature—namely, that documentation and replay support more objective, consistent scoring.

However, the high levels of digital privacy concerns reported by both teachers and students strongly corroborate policy realities and international findings on risks in social media–based education. DepEd's Guidance on Posting Learners' Images or Data on Social Media (Region-level memoranda disseminating OM-OUOPS-2024-05-03942) reiterates that parental consent is required before sharing learner-identifiable content online and frames privacy as a protection issue under the Child Protection Policy (Department of Education [DepEd], 2012; DepEd Region VIII, 2024). These official issuances mirror research noting that while social media boosts participation, it simultaneously introduces anxiety about visibility, unauthorized sharing, and data misuse, especially in youth-centered contexts (Pangrazio & Selwyn, 2022). Consequently, the present finding is not an outlier but rather reflects a well-documented tension between digital innovation and learner safety.

Finally, the proposed guidelines developed in this study are strengthened by their close alignment with both DepEd assessment mandates and recent PE-social media scholarship. DepEd Order No. 8, s. 2015 requires that performance tasks be valid, fair, and aligned with standards, while also encouraging appropriate use of digital tools to gather evidence of learning (DepEd, 2015). Meanwhile, recent work on social media and physical activity emphasizes the need for targeted training and institutional policies to enable educators to harness social platforms responsibly (Zhu et al., 2025). Hence, the study's recommendations for ethical protocols, controlled-access submissions, rubric standardization, and privacy safeguards reflect a coherent convergence among empirical results, policy direction, and broader research trends in digitally supported PE assessment.

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PROPOSED LIVELIHOOD PROGRAM FOR PAROLE AND PROBATION CLIENTS OF DAGUPAN CITY

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Abstract

Livelihood stability is a critical factor in reintegration for individuals under community-based corrections. Yet, parole and probation clients often face persistent employment insecurity, limited market-aligned skills, and stigma-related barriers that undermine their capacity to sustain lawful income. This study assessed the livelihood conditions of parole and probation clients in Dagupan City. It developed a locally grounded livelihood program framework based on identified needs, barriers, and feasible livelihood tracks. Using a descriptive-developmental mixed-methods design, quantitative data were gathered through a structured survey administered to 30 parole and probation clients (n = 30).

In contrast, qualitative inputs from purposively selected stakeholders were used to validate and contextualize the results. Descriptive statistics (frequency, percentage, and weighted mean) were applied to summarize respondent profiles, determine priority livelihood supports, and identify the most experienced livelihood barriers. Thematic analysis was used to integrate stakeholder insights and strengthen program relevance. Results showed that respondents were within productive age groups, predominantly male, and generally characterized by limited educational attainment and dependence on informal or unstable income sources. The most highly needed livelihood supports were job placement and employment referral, market-aligned skills training, and access to start-up capital. Major barriers included a lack of capital, limited availability of stable jobs, and stigma or discrimination associated with criminal justice involvement. Feasibility assessment indicated that construction/trades upgrading, retail and service work, and driving/delivery services were the most viable livelihood tracks for the target population. Based on these findings, the study proposes a structured livelihood program framework that integrates employability services, skills upgrading, enterprise support, and enabling mechanisms to strengthen reintegration outcomes and improve livelihood security among parole and probation clients.

Keywords: Parole; Probation; Livelihood Program; Reintegration; Employment Referral; Skills Training; Dagupan City

1. Introduction

Community-based corrections—including probation and parole—are widely recognized as essential components of modern criminal justice systems because they enable the supervision of justice-involved individuals in the community while supporting rehabilitation, reintegration, and public safety. In contrast to purely custodial approaches, community supervision is designed not only to monitor compliance with legal conditions but also to facilitate gradual reentry into society through structured support and behavior change interventions. International guidance frames community-based measures as part of a balanced, rights-respecting correctional strategy that reduces unnecessary incarceration while strengthening individuals' capacity to reintegrate as productive members of society (Office of the United Nations High Commissioner for Human Rights [OHCHR], 1990). This approach is consistent with contemporary perspectives on desistance and reintegration, which emphasize that long-term crime reduction is most likely when

supervision and supportive services operate together in a coordinated manner (United Nations Office on Drugs and Crime [UNODC], 2018).

The importance of reintegration support is especially evident given the socioeconomic realities faced by parolees and probationers. Many individuals placed under community supervision return to environments characterized by poverty, unstable employment, limited access to services, and exposure to criminogenic pressures. These conditions can undermine both reintegration and compliance because clients may struggle to meet basic needs while also fulfilling supervision requirements such as reporting, attending mandated sessions, and maintaining consistent behavior change routines. UNODC (2018) emphasizes that reintegration is strengthened when community supervision is paired with practical services that address real-life barriers—including employment, livelihood, housing, and access to basic social support. This framing suggests that supervision alone is rarely sufficient to facilitate stable reentry, particularly when structural disadvantages remain unaddressed.

Among the most decisive reintegration factors is access to lawful and stable income. Employment or viable self-employment supports reintegration not only because it provides financial resources, but because it stabilizes daily routines, strengthens prosocial identity formation, increases legitimate social ties, and reduces reliance on informal survival strategies that may increase risk. Employment also helps individuals maintain compliance by covering the practical costs of community supervision, such as transportation to reporting offices, obtaining documentation, and participating in required programs. The evidence base on reentry repeatedly identifies employment as a central lever for improving post-release stability, while also acknowledging that justice-involved populations face layered barriers to labor market participation (U.S. Department of Labor, Employment and Training Administration [DOLE-ETA], 2019).

However, employment instability among parole and probation clients is often rooted in a combination of limited human capital, disrupted education, weak attachment to the formal labor market, and constrained opportunity networks. Many justice-involved individuals enter supervision without marketable credentials, with minimal work history, or with skills that do not align with current labor market demand. As a result, they are more likely to depend on informal work, intermittent jobs, or precarious self-employment, which can lead to recurring instability even when individuals are motivated to work (DOLE-ETA, 2019). Workforce development guidance similarly stresses that skills training is most effective when it is demand-driven and linked to real opportunities, rather than delivered as generic training detached from employer needs and market realities (World Bank, 2025).

A particularly persistent employment barrier is stigma and discrimination linked to criminal justice involvement. Even when individuals possess the skills and motivation to work, employers may still hesitate to hire them because of perceived risk, reputational concerns, or biased assumptions about reliability. Evidence syntheses on reentry employment highlight that this stigma creates a structural barrier that often prevents job-ready candidates from accessing stable work (DOLE-ETA, 2019). International human rights reporting reinforces this point by stressing that discrimination and exclusion can significantly obstruct reintegration outcomes for persons released from detention or placed under non-custodial measures (OHCHR, 1990). These conditions imply that reintegration-oriented livelihood interventions must incorporate strategies that strengthen employer engagement, build supported pathways to work, and reduce stigma-based exclusion.

Beyond stigma, clients may face practical barriers that affect both access to livelihood opportunities and the ability to sustain participation in training or employment. These barriers often include a lack of start-up capital, limited access to tools or equipment, transportation constraints, documentation issues, and competing family responsibilities. Such constraints are widely recognized in livelihood program implementation literature, which shows that training programs frequently underperform when enabling supports—such as capital inputs, toolkits, post-training

coaching, or market linkages—are missing. As a result, effective livelihood interventions typically require more than skills development; they require a pathway model that helps participants convert training into real income generation (World Bank, 2025). For justice-involved clients, this is even more critical, as unstable livelihood conditions can impede both reintegration progress and compliance capacity.

Livelihood interventions are therefore increasingly viewed as legitimate reintegration mechanisms because they address structural barriers that disproportionately affect marginalized groups. In development and social policy contexts, livelihood programs are used to improve access to productive assets, expand employable skills, strengthen enterprise readiness, and connect beneficiaries to opportunities for decent work. These approaches align with reintegration guidance that emphasizes the need for coordinated post-release services and community-based measures that respond to the practical needs of justice-involved individuals (UNODC, 2018). Likewise, evidence on employment-centered reentry programming suggests that job readiness, job matching, placement supports, and coordinated service pathways are crucial elements of successful reintegration strategies (DOLE-ETA, 2019).

Within this broader context, developing a livelihood program proposal for parole and probation clients in Dagupan City is warranted, as it operationalizes global reintegration principles into a localized, implementation-ready framework. While international and national frameworks articulate the value of non-custodial measures, effective community reintegration depends heavily on local conditions: the structure of the local economy, the availability of training providers, the accessibility of employment referral mechanisms, the strength of institutional partnerships, and the lived realities of clients under supervision. International standards, such as the Tokyo Rules, emphasize not only the legitimacy of non-custodial measures but also the importance of community involvement and safeguards that support rehabilitation and reintegration (OHCHR, 1990). UNODC (2018) similarly notes that reintegration outcomes are shaped by the availability of practical services that reduce barriers and enable stable reintegration. These insights suggest that localities must design reintegration supports grounded in their economic and institutional contexts rather than relying solely on general policy principles.

Dagupan City provides a relevant context for livelihood program development, as it is an economically active urban center with commercial, service-oriented, and trade-related opportunities that may support employment or microenterprise pathways. At the same time, parole and probation clients in Dagupan may experience distinct reintegration barriers compared to the general population, such as supervision-linked time constraints, stigma-related exclusion, and limited access to formal job opportunities. Without localized evidence, livelihood programs risk becoming misaligned with client readiness and local market realities, resulting in low participation, weak completion, or limited conversion of training into income. Workforce development guidance underscores that training effectiveness depends on relevance and labor-market linkage, suggesting that programs should be designed through local opportunity mapping and stakeholder coordination (World Bank, 2025).

The need for localized diagnostics is especially significant for parole and probation clients because their livelihoods are closely tied to reintegration outcomes that matter both to individual rehabilitation and to public safety. Economic instability may increase stress, undermine compliance, and reduce clients' ability to sustain prosocial routines. Reintegration frameworks emphasize that preventing recidivism and supporting successful reentry require coordinated interventions that address both individual needs and structural barriers, rather than relying solely on supervision (UNODC, 2018). Employment-focused evidence reviews similarly highlight that justice-involved individuals benefit from structured pathways that connect them to real job opportunities, supported by barrier reduction and service integration (DOLE-ETA, 2019).

Accordingly, the present study addresses a practical, evidence-based gap by proposing a livelihood program for parole and probation clients in Dagupan City, grounded in local needs and

feasibility conditions. The study is anchored on the premise that livelihood stability is not merely an economic outcome. Still, a reintegration mechanism that supports compliance, reduces vulnerability, and strengthens the prospects of long-term desistance. By assessing client profiles, identifying livelihood-related needs and barriers, and mapping feasible livelihood tracks based on readiness and local opportunity, the study aims to develop a program framework that integrates market-aligned skills development with employability services, enterprise support, and enabling mechanisms such as capital assistance, tool provision, documentation support, and partnership coordination. Such a program model aligns with international guidance emphasizing community-based reintegration supports (UNODC, 2018) and with workforce development evidence highlighting the importance of connecting training to real opportunities through structured pathways (World Bank, 2025).

Ultimately, a livelihood program tailored to parole and probation clients in Dagupan City can contribute to broader social and governance objectives. For clients, the program can strengthen income stability and improve their capacity to comply with supervision obligations. For supervising offices and local stakeholders, it can provide a structured reintegration tool that complements monitoring with practical support. For the community, livelihood stability can reduce marginalization and strengthen public safety by supporting lawful participation and reducing exposure to criminogenic risks. In this sense, livelihood programming becomes a strategic reintegration investment—one that must be locally grounded, evidence-informed, and designed not as a single training event, but as a coordinated pathway toward sustained economic participation.

2. Method

2.1 Research Design

This study employed a descriptive-developmental research design anchored in a mixed-methods approach. The descriptive component was used to systematically document and quantify the socio-demographic profile, livelihood conditions, and livelihood-related needs and barriers of parole and probation clients in Dagupan City. Quantitative data were gathered primarily through structured survey responses and were analyzed using descriptive statistics such as frequency counts, percentages, and weighted means to provide an evidence-based picture of participants' characteristics and livelihood circumstances.

The developmental component of the design focused on translating empirical findings into an output-oriented intervention, specifically the formulation of a proposed livelihood program framework for parole and probation clients. In this phase, the results of the needs assessment served as the foundation for identifying feasible livelihood tracks and developing a structured program proposal aligned with participants' readiness and local opportunity contexts.

To strengthen interpretation and program relevance, qualitative inputs (e.g., stakeholder insights and contextual understanding of reintegration constraints) were incorporated to validate and contextualize the quantitative findings. This mixed-methods integration enhanced the study's ability to produce a program proposal that is both data-driven and responsive to real-world reintegration conditions.

2.2 Participants

The study consisted primarily of parole and probation clients in Dagupan City who were under active community supervision during the data-gathering period. These clients served as the main respondents of the research and provided the core quantitative data through the administration of a structured survey questionnaire. A total of 30 parole and probation clients (n = 30) participated as survey respondents, allowing the study to generate descriptive information about their socio-demographic characteristics, livelihood conditions, and livelihood-related needs

and barriers. Participants were selected based on their availability and relevance to the study objectives, and only those residing within Dagupan City and currently under supervision were included. Individuals outside the locale, those no longer under probation or parole supervision, and persons in custodial settings were not part of the study population.

In addition to the primary respondents, the study also included selected stakeholders to support the qualitative component of the research and strengthen the contextual grounding of the findings. These secondary participants, selected through purposive sampling, included supervising personnel and other relevant individuals or representatives from institutions who could provide insights into livelihood implementation and reintegration support. Their participation helped validate and enrich the interpretation of the survey results, ensuring that the resulting livelihood program proposal was both evidence-based and responsive to practical, local reintegration conditions.

2.3 Instrumentation

The study employed researcher-developed instruments to capture both quantitative and qualitative evidence for a livelihood program proposal for parole and probation clients in Dagupan City. For the quantitative component, the primary instrument was a structured survey administered to parole and probation clients. The questionnaire was used to gather data on respondents' socio-demographic profiles, livelihood status, and perceived livelihood needs and barriers, which were later summarized using descriptive statistics, including frequencies, percentages, and weighted means.

For the qualitative component, the study also utilized stakeholder input instruments, such as a guide for key informant interviews and/or focused discussions, to obtain contextual insights from selected supervising personnel and other relevant stakeholders. These qualitative inputs helped interpret the survey findings. They strengthened the feasibility of the proposed livelihood program by incorporating practical considerations for implementation, partnership building, and client support mechanisms.

2.4 Data Analysis

The study used a combination of quantitative and qualitative data analysis procedures consistent with its descriptive-developmental mixed-methods design. For the quantitative data, responses from the structured survey questionnaire were organized, tabulated, and analyzed using descriptive statistics. Specifically, the study employed frequency counts and percentages to summarize respondents' socio-demographic characteristics and livelihood conditions. At the same time, weighted means were used to determine the extent of identified livelihood needs and perceived barriers. These statistical procedures allowed the researcher to present an evidence-based profile of parole and probation clients and to rank or prioritize livelihood concerns based on the respondents' reported experiences.

For the qualitative data, inputs gathered from selected stakeholders through key informant interviews and/or focused discussions were examined using thematic analysis. This involved reviewing responses, identifying recurring patterns, and clustering related statements into themes relevant to reintegration challenges, livelihood feasibility, and program implementation considerations. The qualitative themes were then used to validate and enrich the interpretation of the quantitative findings, ensuring that the proposed livelihood program was not only statistically grounded but also aligned with practical, real-world conditions and stakeholder perspectives within the local setting.

3. Results

The results of the study showed that the parole and probation clients in Dagupan City (n = 30) were largely within the economically productive age groups, with the highest proportion

belonging to the 26–35 age bracket (33.3%), followed by those aged 36–45 (26.7%) and 46–55 (20.0%). The respondents were predominantly male (73.3%), and many were married (43.3%) or single (36.7%), indicating that a substantial portion of the clients likely carried family responsibilities that could influence training participation and livelihood priorities. In terms of educational attainment, the largest share were high school graduates (33.3%), followed by those at the high school level (23.3%) and the college level (23.3%), with smaller proportions at the elementary level and college graduate status. Skills backgrounds were concentrated in construction-related skills (26.7%) and retail/service work (20.0%), with additional skills in food preparation (16.7%), driving/delivery (16.7%), and smaller groups reporting sewing/tailoring and basic computer skills. Importantly, the income profile reflected livelihood vulnerability, as most respondents relied on informal wage employment (30.0%), self-employment (23.3%), and occasional/seasonal work (16.7%), while only a smaller portion reported formal wage employment (16.7%) and a few had no income at all, reflecting broad income instability.

Regarding livelihood needs, the study found that the most strongly prioritized support was job placement and employment referral assistance (WM = 3.47, *Highly Needed*), indicating that respondents considered direct access to employment opportunities as a primary requirement for livelihood improvement. This was followed closely by skills training aligned with local jobs/markets (WM = 3.40, *Highly Needed*) and access to start-up capital or livelihood assistance (WM = 3.33, *Highly Needed*), showing that respondents viewed both employability improvement and financial capability as necessary to sustain lawful income. Other supports such as tools or starter kits (WM = 3.20), financial literacy (WM = 3.13), entrepreneurship coaching (WM = 3.07), market linkage (WM = 3.03), and documentation support (WM = 2.97) were also rated within the *Needed* range, reinforcing that respondents did not only need training but also enabling supports that would allow them to sustain income generation after interventions.

In terms of barriers, the results indicated that the most highly experienced constraints were lack of capital or start-up funds (WM = 3.50, *Highly Experienced*), limited availability of stable jobs (WM = 3.37, *Highly Experienced*), and stigma or discrimination due to criminal justice involvement (WM = 3.30, *Highly Experienced*). These findings suggest that even when clients are motivated to work, structural and social barriers may limit their ability to access stable employment or initiate livelihood activities. Other experienced obstacles included lack of tools/equipment (WM = 3.17), transportation constraints (WM = 3.07), inadequate educational attainment/skills mismatch (WM = 3.03), and lack of required documents (WM = 2.97), with family responsibilities also affecting attendance and participation (WM = 2.70). Overall, the barrier profile emphasized that livelihood interventions must address both resource constraints and access barriers to produce sustainable outcomes.

Finally, the feasibility assessment of livelihood tracks—based on client readiness and local economic opportunities—showed that the most feasible and priority tracks for Dagupan City were Construction/Trades Upgrading (Overall Feasibility = 4.15, Rank 1), Retail and Service Work (Overall = 4.00, Rank 2), and Driving/Delivery Services(Overall = 3.95, Rank 3). These tracks were followed by Food Preparation and Baking (Overall = 3.80, Rank 4) and microenterprise options such as Vending (Overall = 3.70, Rank 5) and Fish/Food Value-Chain Microenterprise(Overall = 3.60, Rank 6). Lower-ranked but still feasible tracks included Basic Digital Work (Overall = 3.40, Rank 7) and Sewing/Tailoring Services (Overall = 3.15, Rank 8), which were considered more appropriate for selected participants and would require stronger resource support. These results collectively supported the need for a locally grounded livelihood program that prioritizes high-feasibility employment tracks while providing enterprise and specialized options supported by enabling services.

4. Discussion

The findings of the study underscore that livelihood insecurity remains a central reintegration challenge among parole and probation clients in Dagupan City. The participant profile indicates that most respondents were in their prime working years and predominantly male, with many reporting limited educational attainment and focusing on trades, retail/service work, and food-related tasks. This pattern is consistent with reentry and workforce evidence showing that justice-involved populations often enter community supervision with disrupted schooling, limited formal work history, and uneven access to market-aligned credentials—factors that constrain formal employment entry and push individuals into informal or unstable work arrangements (U.S. Department of Labor, Employment and Training Administration [DOL-ETA], 2019). In the present study, this vulnerability was reflected in the respondents' reliance on informal wage work, self-employment, and occasional/seasonal work, with only a minority holding formal employment. These conditions suggest that parole and probation clients may be attempting to sustain reintegration through income streams that are inherently unstable and thus insufficient for long-term compliance and desistance.

A key contribution of the study lies in the clear prioritization of livelihood supports. Respondents identified job placement and employment referrals as the most needed forms of assistance, followed by skills training aligned with local market opportunities and access to start-up capital. This ranking is notable because it suggests that participants do not primarily view training as an isolated solution; instead, they view livelihood improvement as a pathway that must connect them directly to opportunities and resources. This aligns with international reintegration guidance that emphasizes the importance of coordinated post-release support systems—particularly those that facilitate access to employment, services, and social supports to reduce the risk of relapse into offending (United Nations Office on Drugs and Crime [UNODC], 2018). It also reflects broader development evidence that skills initiatives are most effective when they are demand-driven, connected to employers, and designed around employment outcomes rather than training completion alone (World Bank, 2020).

The barrier results reinforce why referral and capital support emerged as major priorities. The most highly experienced constraints were lack of start-up funds, limited availability of stable jobs, and stigma or discrimination linked to criminal justice involvement. These findings are consistent with international and U.S.-based reentry evidence showing that justice-involved individuals face structural and social barriers to employment, including employer hesitation, legal restrictions in some contexts, and persistent stigma that can exclude otherwise employable candidates (DOL-ETA, 2019). In practical terms, stigma underscores the importance of intermediary mechanisms such as job matching, employer partnerships willing to hire justice-involved individuals, and structured referral arrangements that make hiring less risky and more predictable for employers. Likewise, the prominence of capital barriers underscores that enterprise-oriented livelihood tracks—such as vending, value-chain microenterprise, or service-based self-employment—cannot be implemented effectively without access to start-up inputs, toolkits, and post-training coaching. This observation aligns with workforce and skills development guidance, which emphasizes that training must be paired with enabling supports to translate into sustainable income generation (World Bank, 2020).

Taken together, the needs and barriers indicate that the proposed livelihood program should be conceptualized as a reintegration pathway rather than a single intervention. The Tokyo Rules, which provide international standards for non-custodial measures, emphasize that community-based measures should promote rehabilitation and involve the community in the treatment and reintegration of offenders (Office of the United Nations High Commissioner for Human Rights [OHCHR], 1990). The study's findings support this direction by demonstrating that parole and probation clients require community-linked support systems that connect them to job opportunities, reduce exclusion, and provide practical assistance. In this sense, livelihood

programming can serve as a reinforcement mechanism for supervision: stable livelihoods improve clients' capacity to meet supervision obligations and strengthen their ability to build prosocial routines, which are central to longer-term reintegration success (UNODC, 2018).

The feasibility analysis further strengthens the programmatic implications by identifying livelihood tracks that align with both participants' skill clusters and local economic realities. Construction/trades upgrading ranked as the most feasible track, followed by retail/service work and driving/delivery services. These tracks are consistent with respondents' reported skill backgrounds and with the labor-market logic that, in many urban Philippine settings, the construction and service sectors provide accessible entry points for semi-skilled workers. Importantly, the high feasibility of construction/trades upgrading suggests that a well-designed program could focus on certification, safety training, and skills upgrading linked with actual contractors or construction firms. Likewise, retail/service work feasibility implies the potential for job placement partnerships with malls, supermarkets, logistics operations, and other service-sector employers—especially when supported by pre-employment orientation, employer engagement, and stigma-reduction mechanisms. Such interventions align with employment reentry evidence, which emphasizes the importance of structured partnerships and integrated support services to improve job access (DOL-ETA, 2019).

At the same time, the feasibility of food preparation, vending, and value-chain microenterprise pathways highlights the importance of enterprise support models—particularly for clients who may be unable to secure formal employment due to discrimination or limited openings. The study's barrier findings, however, suggest that enterprise tracks must incorporate start-up capital, access to tools, market linkages, and coaching; otherwise, they risk becoming aspirational but non-operational. This is consistent with global skills and livelihood policy evidence, which notes that training outcomes improve when programs link beneficiaries to real markets and provide post-training support that enables sustained engagement and income generation (World Bank, 2020).

Overall, the study supports a livelihood program model that integrates: (a) job placement and referral mechanisms, (b) market-aligned skills upgrading, (c) start-up assistance for enterprise pathways, and (d) enabling supports such as tools, documentation support, financial literacy, and coaching. These components collectively respond to both the needs and barriers articulated by the participants. Moreover, grounding the program in locally feasible tracks increases the likelihood that training and support services will translate into measurable livelihood outcomes rather than remain stand-alone capacity-building activities. Such an approach aligns with UNODC's reintegration guidance, which emphasizes that reintegration is strengthened when community supervision is linked to services that address real-life risks and needs, especially employment and livelihood stability (UNODC, 2018).

In conclusion, the results of the study suggest that a single factor does not drive livelihood insecurity among parole and probation clients in Dagupan City, but rather an interaction of human capital limitations, capital constraints, limited stable job opportunities, and stigma-related exclusion. Addressing these constraints requires a reintegration-oriented livelihood program that is both evidence-based and locally grounded. The study's proposed livelihood tracks provide a strong foundation for such a program by identifying realistic employment and enterprise pathways that can be strengthened through partnerships, enabling supports, and sustained coaching. In line with the Tokyo Rules and UNODC guidance, livelihood programming can be positioned as a strategic reintegration investment—one that strengthens not only economic participation, but also community safety and long-term desistance through stability, inclusion, and structured support systems (OHCHR, 1990; UNODC, 2018).

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THE ROLE OF PHYSICAL EDUCATION IN DEVELOPING SOCIAL SKILLS AMONG HIGH SCHOOL LEARNERS

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Abstract

This quantitative descriptive-comparative study examined the role of Physical Education (PE) in developing social skills among high school learners in the Metro Public High School District of Dagupan City. The study aimed to (1) determine the mean level of learners' self-reported social skills development in teamwork, communication, and conflict resolution, and (2) assess whether positive social interactions differed between structured PE activities and unstructured recreational activities. A total of 600 Grade 9–12 learners were selected through systematic random sampling. Data were gathered using a validated Self-Report Social Skills Development Survey (Cronbach's $\alpha = 0.89$) and a Systematic Observational Checklist that measured cooperative play and verbal encouragement during two comparable 15-minute activity conditions. Descriptive statistics summarized mean levels and observed frequencies, while a paired-samples t-test tested differences at $\alpha = 0.05$.

Results indicated an overall High level of self-reported social skills development ($\bar{x} = 4.01$), with teamwork rated Very High ($\bar{x} = 4.38$), suggesting strong perceived collaborative competence fostered in PE. Observations revealed that positive social interactions occurred more frequently during structured physical activities ($\bar{x} = 8.67$) than during unstructured recreational activities ($\bar{x} = 4.52$). The paired-samples t-test showed a statistically significant difference between conditions ($p < .001$), leading to rejection of the null hypothesis. These findings confirm that intentional structure and pedagogical design in PE, rather than physical activity alone, significantly strengthen observable positive social behaviors. The study recommends integrating cooperative learning tasks, explicit conflict-resolution routines, and reflective debriefing to maximize PE's contribution to learners' social and emotional development.

Keywords: Physical Education; Social Skills; Teamwork; Communication; Conflict Resolution; Cooperative Play; Structured Activities; Unstructured Recreation; High School Learners

1. Introduction

Physical Education (PE) has long been framed as more than a venue for fitness and motor development; it is a social learning space where adolescents repeatedly negotiate rules, roles, cooperation, and emotions with peers. International literature consistently shows that PE and school-based sport settings can contribute to social competence, including communication, teamwork, empathy, and prosocial decision-making (Jadwiszczak et al., 2025; Bailey, 2006). In adolescence, these skills become increasingly vital because peer relationships strongly shape learners' identity, mental health, classroom engagement, and later employability. Consequently, many contemporary PE frameworks emphasize social and emotional learning (SEL) alongside physical literacy, positioning PE as a context in which learners practice relationship skills through authentic, high-interaction tasks (Promoting Social and Emotional Learning in Physical Education, 2024; Edutopia, 2022). Systematic evidence further suggests that physical activity interventions embedded in school PE or sport environments can improve learners' social competence when tasks are intentionally designed for interaction and reflection (Opstoel et al., 2020; Vella et al.,

2018). These findings highlight PE as a strategic curricular site for the development of social skills during high school, a developmental stage marked by heightened sensitivity to belonging, peer approval, and conflict management.

In the Philippine context, the national curriculum explicitly supports this broadened view of PE. Republic Act 10533 and its Implementing Rules and Regulations mandate a learner-centered, research-based, and collaborative curriculum that develops 21st-century competencies, including interpersonal and self-management skills (Republic Act No. 10533, 2013; DepEd Order No. 43, s. 2013). Within this framework, the K to 12 PE Curriculum Guide emphasizes not only fitness and movement but also social or interpersonal skills such as communication, collaboration, leadership, and cross-cultural competence that emerge through participatory physical activities (Department of Education [DepEd], 2016). More recently, the MATATAG PE and Health Curriculum likewise foregrounds holistic development and the cultivation of communication and collaboration through meaningful movement experiences (DepEd, 2023). At the policy level, DepEd's continuing focus on learner socio-emotional support underscores that schools must intentionally nurture psychosocial well-being and resilience as part of quality basic education (DepEd, 2023a). Related protective policies—such as the Child Protection Policy and the Anti-Bullying Act IRR—reinforce the need for school programs that strengthen respectful interaction, conflict prevention, and prosocial behavior (DepEd Order No. 40, s. 2012; DepEd Order No. 55, s. 2013). Together, these issuances suggest that PE carries a legitimate and expected role in cultivating social skills, particularly those that help prevent bullying, support inclusion, and sustain safe learning environments.

Despite this strong policy and theoretical positioning, a practical gap remains in how PE translates social outcomes into observable behavior. International research indicates that social development in PE is not automatic; rather, it depends on the structure of tasks, the degree of cooperative interdependence, and the teacher's intentional facilitation of reflection and conflict resolution (Jadwiszczak et al., 2025; Promoting Social and Emotional Learning in Physical Education, 2024). For instance, structured PE lessons—characterized by teacher guidance, formal roles, and shared goals—often create predictable opportunities for collaborative problem-solving and verbal encouragement. At the same time, unstructured settings may yield social benefits inconsistently depending on peer dynamics (Simonton, 2020). Recent empirical work comparing structured and unstructured PE contexts shows that structured activities tend to promote teamwork and constructive peer interaction more reliably.

In contrast, unstructured play can encourage autonomy and creativity but may also enable exclusion or conflict without adult scaffolding (Open Public Health Journal, 2025). This distinction is crucial in high schools, where learners bring varying levels of social maturity, competitive tendencies, and prior sport experience into PE classes. Hence, while DepEd curriculum guides call for the development of interpersonal skills through movement, evidence is still needed to clarify *which activity conditions most effectively elicit positive social interactions among* Filipino high school learners—and whether learners' self-perceptions align with their actual behaviors.

Locally, studies on PE in the Philippines have tended to emphasize physical fitness, participation rates, or attitudes toward sport, leaving fewer quantitative investigations focused on social skills as primary outcomes, particularly at the high school level. This gap is notable given persistent national concerns about bullying, peer conflict, and adolescent psychosocial stress, all of which directly involve deficits in communication, empathy, and conflict resolution (DepEd Order No. 55, s. 2013). Moreover, as schools adopt more inclusive education practices, PE becomes one of the most socially demanding learning areas where successful inclusion depends on learners' cooperative capacities and respectful peer engagement (DepEd, 2016). Without systematic local evidence, PE teachers and curriculum planners may rely on incidental learning—assuming that playing together naturally builds social skills—rather than adopting explicit pedagogical strategies. Therefore, establishing Philippine-based data on both perceived and

observed social development in PE is essential to support the evidence-guided implementation of DepEd's holistic, SEL-aligned curriculum directions.

In response to this research space, the present study investigates "The Role of Physical Education in Developing Social Skills Among High School Learners" in the Metro Public High School District of Dagupan City. Specifically, it measures the mean level of learners' self-reported social skills development in teamwork, communication, and conflict resolution. It compares the observed frequency of positive social interaction—cooperative play and verbal encouragement—between structured PE activities and unstructured recreational activities. By examining both subjective perceptions and objective behavioral frequencies, the study generates a more complete picture of PE's social contribution. Additionally, testing differences between activity types answers a key instructional question implicit in DepEd policy: whether structured, curriculum-guided PE provides stronger social learning outcomes than unstructured free play. Ultimately, the findings aim to inform activity design and pedagogy, supporting PE teachers in meeting DepEd's mandate for 21st-century skills, SEL integration, and safe, socially supportive school environments. In doing so, the study contributes local empirical evidence to strengthen curriculum planning and the intentional use of PE as a vehicle for adolescent social development.

2. Method

2.1 Research Design

The study used a descriptive-comparative quantitative research design to determine the role of Physical Education (PE) in developing social skills among high school learners and to compare positive social interactions across activity settings. The descriptive component established baseline levels of learners' self-reported social skills—teamwork, communication, and conflict resolution—through a validated Likert-scale survey and documented the frequency of observable positive social interactions—cooperative play and verbal encouragement—using a systematic observational checklist. The comparative component examined whether the mean observed frequency of positive social interaction differed between structured, curriculum-guided PE activities and unstructured recreational/free-play periods. Because the same 600 learners were observed under both conditions, dependent-samples analysis was appropriate; thus, descriptive statistics summarized means and frequencies, while a paired-samples t-test tested the null hypothesis at the 0.05 level of significance, ensuring conclusions were based on numerical evidence.

2.2 Participants

The study was 600 high school learners from Grades 9 to 12 who were officially enrolled in and actively participating in the required Physical Education (PE) curriculum in the Metro Public High School District of Dagupan City during the academic year of the study. They were selected through systematic random sampling using a master list provided by the District Registrar, with every kth eligible learner chosen until the target sample size was reached to ensure representation across grade levels. Inclusion criteria required that participants be current PE enrollees and regular PE class attendees, while learners who were medically excused from participation for the semester were excluded. Prior to data gathering, informed assent/consent was obtained from all participants, and parental consent was secured for minors, consistent with ethical standards for research involving adolescents.

2.3 Instrumentation

The study used two primary instruments to measure social skills development, using both subjective and objective data. First, a Self-Report Social Skills Development Survey, adapted and validated by three experts in Physical Education and psychology, assessed learners' perceived

competence in teamwork, communication, and conflict resolution using a 5-point Likert scale (1 = Never to 5 = Always); pilot testing with 30 non-participant students yielded a Cronbach's alpha of 0.89, indicating high reliability. Second, a Systematic Observational Checklist was designed to quantify positive social interactions—specifically cooperative play and verbal encouragement—recorded as frequency counts while participants engaged in two comparable 15-minute conditions: one structured PE activity and one unstructured recreational/free-play period; observers were trained, and inter-rater reliability was established to ensure consistent and accurate behavioral recording across settings.

2.4 Data Analysis

Descriptive statistics—specifically the mean and standard deviation—were computed to assess learners' self-reported development of social skills in teamwork, communication, and conflict resolution. At the same time, frequency counts and percentages summarized the observed occurrences of cooperative play and verbal encouragement in both structured and unstructured activity conditions. To test whether a significant difference existed in positive social interaction between the two settings, a paired-samples t-test (dependent-samples t-test) was employed because the same 600 learners were observed in both conditions; results were evaluated at the 0.05 level of significance to decide whether to reject or retain the null hypothesis, and the combined findings served as the basis for proposing evidence-based pedagogical strategies for PE instruction.

3 Results

The study found that high school learners generally demonstrated a strong perception of their social development through Physical Education. Specifically, the overall mean level of self-reported social skills was rated High($\bar{x}$ = 4.01), indicating that students believed PE contributed positively to their teamwork, communication, and conflict-resolution abilities. Notably, teamwork emerged as the most developed domain, obtaining a Very High rating ($\bar{x}$ = 4.38). This suggests that the collaborative nature of PE activities provided learners with frequent opportunities to work with peers, coordinate goals, and build shared responsibility. In comparison, communication and conflict resolution also reflected positive development, reinforcing the idea that PE serves as a meaningful setting for social skill practice.

In addition to learners' perceptions, the observational findings provided a concrete picture of how often positive social behaviors were displayed in different activity contexts. Results showed that positive social interaction—measured through cooperative play and verbal encouragement—occurred much more frequently during structured physical activities than during unstructured recreational activities. The mean observed frequency of positive interaction in structured settings was $\bar{x}$ = 8.67, whereas in unstructured settings it was substantially lower at $\bar{x}$ = 4.52. Thus, while both environments involved physical movement, structured PE sessions appeared to offer clearer expectations, shared goals, and organized peer engagement, which in turn promoted more consistent prosocial behavior among learners.

Finally, when the two observational conditions were statistically compared, the paired-samples t-test confirmed that the difference was not due to chance. The analysis yielded a statistically significant difference ($p < .001$) in the observed frequency of positive social interaction between structured and unstructured activities. Consequently, the null hypothesis was rejected, indicating that activity type and intentional structure played a decisive role in eliciting cooperative and encouraging peer behaviors. Therefore, the findings collectively highlight that although learners view PE as supportive of social skills, the structured design of PE activities is what most strongly translates these skills into observable, positive social interaction.

4. Discussion

The findings on learners' high self-reported social skills development are strongly supported by prior literature that positions Physical Education as a natural context for interpersonal growth. In this study, students rated their overall social skills as High, reflecting perceived competence in teamwork, communication, and conflict resolution. Similarly, research emphasizes that PE settings inherently demand interaction—students coordinate movement, negotiate rules, and respond to peers in real time—making them fertile environments for social learning (Jadwiszczak et al., 2025). Moreover, reviews of PE outcomes confirm that when students repeatedly engage in shared physical tasks, they tend to report gains in communication and cooperation, even when the lesson focuses on skill or fitness development (Bailey, 2006; Vella et al., 2018). Therefore, the learners' positive self-assessments in this study align with the broader view that PE contributes meaningfully to adolescents' social competence.

More specifically, the Very High self-reported teamwork result corroborates evidence that collaborative movement tasks and team games promote learners' sense of collective responsibility. In the present study, teamwork emerged as the strongest perceived domain, suggesting learners recognize PE as a space that reinforces shared goals and mutual support. This matches cooperative learning scholarship, which identifies teamwork as one of the earliest and most consistently developed social outcomes in PE because activities require interdependence, role acceptance, and group problem-solving (PE Scholar, 2025). Likewise, youth sport and PE studies describe team-based tasks as "social laboratories" in which students learn coordinated effort within a structure of rules and expectations (EA Journals, 2025). Thus, the dominance of teamwork in learners' ratings is not only expected but also consistent with theoretical and empirical claims about PE's collaborative nature.

In addition, the study's observation that positive social interaction was far more frequent in structured activities than in unstructured recreation mirrors the argument that structure functions as a social scaffold in PE. The higher mean frequency of cooperative play and verbal encouragement during structured lessons suggests that teacher-guided tasks, formal rules, and explicit objectives generate clearer pathways for prosocial engagement. Related studies note that structured PE contexts consistently provide more predictable opportunities for peer support, feedback, and cooperative problem-solving, whereas unstructured settings may allow interaction but do not reliably produce positive exchanges without guidance (Kinder et al., 2020; Open Public Health Journal, 2025). Furthermore, systematic reviews of PE-based interventions highlight that prosocial behaviors become more visible when lessons intentionally build cooperation and shared accountability into the activity design (Jadwiszczak et al., 2025; Vella et al., 2018). Consequently, the observed patterns in this study reinforce the claim that *how* PE is organized matters as much as the activity itself.

Furthermore, the statistically significant difference between structured and unstructured conditions strengthens this corroboration by showing that the effect is not incidental. The rejection of the null hypothesis confirms that the structured environment activates prosocial behaviors more consistently than free play. This result aligns with earlier work distinguishing between structured and unstructured physical activity contexts, in which structured programs are more strongly linked to guided peer interaction and social influence processes than to leisure or free-choice activity (Kinder et al., 2020; Standage et al., 2012). While unstructured activity can support autonomy and spontaneous peer bonding, the literature warns that its social outcomes vary depending on group dynamics, competitiveness, or exclusion risks, which may depress consistent cooperative behavior (Open Public Health Journal, 2025). Therefore, the significant difference found in this study aligns with international evidence that structure is a key predictor of prosocial interaction frequency.

Notably, the finding that positive behaviors were driven by intentional pedagogy rather than mere participation in physical activity resonates with models explicitly designed for social

development in PE. Approaches such as Teaching Personal and Social Responsibility (TPSR) and cooperative learning stress that social skills flourish when teachers deliberately embed roles, reflection, and shared responsibility into lessons (Escartí et al., 2024; PE Scholar, 2025). Meta-analytic and review evidence shows that TPSR-based programs improve social responsibility, empathy, and cooperative conduct by turning social expectations into teachable moments through structured progression and reflection (Escartí et al., 2024). In light of this, the present study's results validate the need for PE teachers to shape interaction patterns through intentional instructional design rather than relying on "incidental learning."

Finally, the pedagogical implications proposed in this study are corroborated by existing research emphasizing the explicit integration of social-emotional learning (SEL) in PE. The recommendation to increase intentional instruction, employ conflict-resolution routines, and conduct reflective debriefing is consistent with the literature, which shows that structured reflection helps adolescents process peer conflict, regulate emotion, and transfer social skills beyond PE contexts (Escartí et al., 2024; Vella et al., 2018). Moreover, cooperative play and verbal encouragement are repeatedly identified as visible indicators of social competence that can be strengthened through teacher-guided roles, collaboration tasks, and post-activity processing (PE Scholar, 2025; Jadwiszczak et al., 2025). Hence, the study's proposed strategies are grounded in quantitative evidence and aligned with well-supported international models for maximizing PE's social development function.

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LIVELIHOOD SKILLS TRAINING AS A PREDICTOR OF JOB READINESS AMONG ALS LEARNERS IN SDO URDANETA CITY: INPUTS FOR AN ENHANCED LEARNING PLAN

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Major in Technology and Livelihood Education

Abstract

This study examined the level of livelihood skills training and job readiness among Alternative Learning System (ALS) learners in SDO Urdaneta City. It determined whether livelihood skills training significantly predicts job readiness. Using a quantitative, descriptive–correlational design, data were collected from ALS learners through a validated structured questionnaire measuring livelihood skills training dimensions (instructional support, practice opportunities, and availability of tools/materials) and job readiness indicators (work values and habits, technical competence, employability skills, and job-seeking confidence). Descriptive statistics, Pearson correlation, and linear regression analyses were applied. Results indicated that ALS learners reported high levels of livelihood skills training (WM = 3.86, SD = 0.69) and job readiness (WM = 3.74, SD = 0.70). Among livelihood training indicators, relevance and trainer support obtained high ratings, while tools/materials availability received only a moderate rating. In job readiness, work values and habits were rated highest, whereas job-seeking/livelihood confidence was moderate, indicating a transition gap between training and employment engagement. Correlation analysis revealed a strong positive relationship between livelihood skills training and job readiness ($r = 0.68$, $p < .001$). Regression findings further showed that livelihood skills training significantly predicted job readiness ($\beta = 0.68$, $p < .001$), explaining 46% of the variance in readiness outcomes ($R^2 = 0.46$). These findings highlight the importance of strengthening ALS livelihood training delivery, particularly in ensuring resource sufficiency and support for employability transitions, to improve learners' readiness for sustainable employment and livelihood participation.

Keywords: Alternative Learning System (ALS); Livelihood Skills Training; Job Readiness; Employability; Regression Analysis

1. Introduction

Out-of-school youth and adults (OSYAs) remain a persistent development challenge in many low- and middle-income countries because educational exclusion is closely associated with poverty, labor market vulnerability, and intergenerational disadvantage. In this context, second-chance education systems have been increasingly recognized as a critical policy response, particularly when they integrate employability and livelihood competencies alongside foundational education. The Philippines' Alternative Learning System (ALS) is one such national strategy, designed to provide flexible, community-based learning opportunities to individuals who are unable to access or complete formal schooling. ALS serves learners with diverse backgrounds and constraints, including work obligations, household responsibilities, geographical barriers, and economic limitations, making it a key instrument for inclusive education and human capital development (World Bank, 2018).

While ALS is frequently conceptualized as a pathway to basic education equivalency, its broader developmental value rests on whether it can effectively enhance learners' capabilities for

productive work and sustainable livelihoods. A major constraint in second-chance education programs is that learners often face a high opportunity cost of participation and may question the economic returns of completing the program (World Bank, 2018). This implies that ALS outcomes should not be assessed solely through academic equivalency or completion indicators, but also through employability-relevant outcomes that reflect the realities of OSYA learners, such as job readiness, self-employment capacity, and livelihood resilience. Consequently, ALS programs that include livelihood skills training—whether through formal linkages with Technical and Vocational Education and Training (TVET) institutions or localized community skills development—are increasingly of interest to educators and policymakers.

Globally, the strategic importance of technical and vocational skills development is well established. UNESCO emphasizes that TVET and skills development play a decisive role in enabling empowerment, employability, and the transition to sustainable and digital economies, highlighting the need for accessible, labor-market-relevant training pathways (UNESCO, 2022). In parallel, joint international analyses have noted that many TVET systems remain misaligned with labor market needs and are often insufficiently responsive to evolving employment structures, particularly for vulnerable populations (UNESCO, 2023). These global findings are highly relevant for ALS learners who frequently experience compounded barriers, including limited credential signaling, constrained networks, and weaker access to stable employment. In such settings, livelihood skills training may function not only as a competence-building intervention but also as a mechanism to improve learner confidence, employability orientation, and workforce participation.

In the Philippine setting, ALS has been repeatedly positioned as a critical platform for second-chance education, yet ongoing assessments highlight implementation gaps and uneven quality across locations. A process evaluation of ALS has underscored the program's vital role while also noting challenges in implementation effectiveness, including variability in delivery systems and learner support structures (Philippine Institute for Development Studies [PIDS], 2024). These findings suggest that in addition to access and completion, ALS must strengthen instructional quality and learner outcomes—particularly those linked to improved socioeconomic mobility. From a human capital standpoint, integrating livelihood training into ALS is especially salient, as OSYA learners often seek immediate economic benefits and may prioritize skills that can translate into employment or enterprise opportunities.

Skills training within the broader Philippine TVET ecosystem provides a useful reference point for understanding how livelihood-oriented interventions can influence employment outcomes. Evidence from post-secondary TVET indicates that vocational training can affect labor market outcomes, including wages and employment probabilities, although impacts may differ by learner background and program characteristics (Orbeta & Paqueo, 2021). At the institutional level, TESDA maintains extensive employability and impact evaluation research programs, reflecting sustained national attention to the linkage between technical training and labor market outcomes (Technical Education and Skills Development Authority [TESDA], n.d.). Recent applied studies also reinforce the positive role of competency-based skills training in improving employment and livelihoods. For example, research on TESDA Dressmaking NC II training reports contributions to skills development and employment-related benefits among trainees (Calaranan, 2025). Although ALS learners differ from formal TVET cohorts, these insights are relevant because livelihood skills training in ALS often draws on similar competency-based models and may involve TESDA-aligned standards or community-based skills approaches.

The policy environment further reflects the increasing prominence of skills development as a national priority. Public reporting has indicated that the Philippines has sought large-scale international funding to strengthen TVET access, completion, and market relevance through programs implemented by TESDA, highlighting a strong national commitment to improving workforce-relevant skills pathways (BusinessWorld, 2025). This macro-level direction reinforces

the need for local evidence on how livelihood training components—particularly those delivered through ALS—translate into employability-related outcomes among marginalized learners. As resource allocation intensifies, decision-makers require empirical findings that identify which aspects of livelihood training matter most for workforce transition and job readiness.

Despite the recognized importance of livelihood skills training, a persistent research gap concerns the extent to which such training predicts or enhances job readiness among ALS learners. Job readiness is broadly understood as the capacity to pursue, secure, and sustain employment or livelihood opportunities. It typically encompasses a combination of technical competence, work habits, career planning, job search self-efficacy, communication skills, and adaptive behaviors aligned with workplace expectations. Among ALS learners, job readiness is particularly critical because they often enter the labor market with limited formal credentials, and their employment pathways may depend heavily on demonstrable skills, practical competencies, and readiness behaviors rather than academic attainment alone.

ALS-specific evidence suggests that alternative learning programs can positively influence learners' life skills and quality of living, indicating the potential for broader developmental benefits beyond literacy (Research Publish, n.d.). However, gains in life skills do not automatically imply employability outcomes, and job readiness may depend on the availability, quality, and relevance of livelihood training inputs, such as instructional support, tools and equipment, and exposure to real-world work practices. Moreover, second-chance learners may face structural constraints that hinder the translation of training into employment, including labor-market informality, limited local job opportunities, and employer bias against non-traditional education pathways. For these reasons, assessing the relationship between livelihood training and job readiness requires localized, empirically grounded inquiry.

Accordingly, this study is positioned to provide evidence on the relationship between ALS livelihood skills training and job readiness among ALS learners. Specifically, it examines livelihood training dimensions such as instructional support, opportunities for practice, and the sufficiency of training materials and tools. It evaluates whether these factors are statistically associated with job readiness outcomes. This focus aligns with broader TVET reform principles emphasizing that training systems must ensure relevance, competence acquisition, and transition support if they are to improve employment and productivity outcomes (World Bank, 2020). Furthermore, given the implementation variability noted in ALS program evaluations, local evidence is essential to identify actionable strengths and constraints in livelihood training delivery and to inform targeted program enhancements (PIDS, 2024).

This study is also timely because it supports evidence-based decision-making in contexts where the policy emphasis on employability, livelihood resilience, and human capital development continues to intensify. UNESCO's recent TVET strategy emphasizes skills development for empowerment and employability, underscoring the role of accessible and equitable skills systems in improving life outcomes for vulnerable learners (UNESCO, 2022). ALS provides a practical mechanism to operationalize these goals, but its effectiveness depends on whether its livelihood skills training components are sufficiently robust to support learners' transition to work. By assessing the predictive relationship between livelihood training and job readiness, the study offers empirical guidance for educators, ALS implementers, and local stakeholders seeking to strengthen learner outcomes.

In summary, ALS plays a vital role in second-chance education, yet its developmental value is increasingly tied to its capacity to generate employability-relevant outcomes. The integration and effectiveness of livelihood skills training are therefore central to ALS success, particularly for OSYAs who need work-relevant competencies to improve socioeconomic mobility. Drawing on international and national evidence on skills development and training-to-employment linkages, this study examines whether livelihood skills training predicts job readiness among ALS

learners, thereby contributing to program improvement and evidence-based policy guidance in inclusive education and workforce development.

2. Method

2.1 Research Design

This study employed a quantitative, non-experimental, cross-sectional research design using a descriptive–correlational approach. The design was selected to (a) describe the level of livelihood skills training experienced by Alternative Learning System (ALS) learners and the level of their job readiness, and (b) examine the statistical relationships between livelihood skills training dimensions and job readiness outcomes. Because the study sought to determine whether variation in livelihood skills training was associated with variation in job readiness without manipulating any variables, an experimental or quasi-experimental design was not appropriate.

Consistent with descriptive–correlational methodology, the study assessed variables as they naturally occurred among ALS learners in their learning context. Data were collected at a single point in time through a structured survey instrument that captured learners' perceptions of (i) the quality and adequacy of livelihood skills training, and (ii) job readiness indicators. The design also incorporated an associationally predictive component, in which the livelihood training dimensions were treated as explanatory variables and job readiness as the outcome variable, to test whether livelihood skills training significantly predicts job readiness.

The choice of this design is aligned with the study's objective to generate evidence-based insights for ALS program improvement. Specifically, the descriptive component supports program monitoring by identifying strengths and gaps in the delivery of livelihood training. In contrast, the correlational/predictive component informs decision-making by determining which training dimensions are most strongly associated with job readiness. Importantly, although predictive analysis (e.g., regression) may identify statistically significant predictors, the design does not permit causal inference; therefore, findings are interpreted as evidence of association and prediction rather than direct causation.

2.2 Participants

The participants in this study were Alternative Learning System (ALS) learners enrolled in the ALS program during the research. The study focused on learners participating in livelihood skills training components of ALS, as these learners were considered the most appropriate respondents for assessing the perceived quality of livelihood training and its relationship with job-readiness outcomes.

A non-probability sampling approach was employed, specifically purposive sampling, to ensure that respondents met the study's inclusion criteria. Participants were selected based on their (a) active enrollment in ALS, (b) attendance in livelihood-related learning sessions or training activities, and (c) willingness to participate in the survey. Learners who were not currently engaged in the livelihood training component, had incomplete participation in the ALS learning sessions during the data collection period, or declined informed consent were excluded to protect data quality and ethical compliance.

The ALS learners represented a range of demographic and educational backgrounds typical of out-of-school youth and adult populations, including variations in age, sex, and educational attainment. This diversity was important to capture because ALS participants often enter the program with varying levels of prior schooling, work experience, and livelihood experience, which may influence both their training perceptions and job-readiness indicators. The participant composition, therefore, supported the study's descriptive goal and provided sufficient variability for correlational and regression analyses.

All participants were informed of the study's purpose and procedures, and their participation was voluntary. Before survey administration, respondents were provided with an explanation of confidentiality protections. They were assured that their responses would be used strictly for research purposes and reported only in aggregated form.

2.3 Instrumentation

Data were gathered using a researcher-developed, structured survey questionnaire designed to measure the study's central variables, namely livelihood skills training and job readiness among Alternative Learning System (ALS) learners. The instrument was organized into sections that captured respondents' basic profiles, perceptions of the ALS livelihood skills training experiences, and self-reported readiness to pursue employment or livelihood opportunities. To ensure the instrument was appropriate for ALS learners with varying educational backgrounds, the items were written in clear, straightforward language and arranged logically to facilitate completion.

The livelihood skills training portion of the questionnaire assessed learners' perceptions across key training dimensions, including instructional support, opportunities for skills practice, and the availability of tools and materials needed to perform livelihood tasks. Items were presented in a Likert-type response format, allowing respondents to rate the extent of their agreement or the perceived adequacy of the training provisions. Subscale scores and an overall livelihood training score were computed by averaging item responses, where higher mean scores reflected more favorable assessments of training quality and support. The job readiness portion of the instrument measured participants' perceived preparedness for work or livelihood engagement, with items reflecting readiness domains such as employment self-confidence, job-seeking preparedness, and workplace preparedness behaviors (e.g., responsibility, time management, and adaptability). Job-readiness items also used a Likert-type scale, and an overall readiness score was derived using mean aggregation, with higher scores indicating stronger perceived readiness for employment or livelihood participation.

To establish content validity, the questionnaire was evaluated by experts with relevant knowledge in ALS instruction, livelihood training, and educational research. These validators assessed the relevance, clarity, and alignment of each item with the study constructs, and their recommendations were incorporated to strengthen wording and ensure construct coverage. A pilot test was then conducted with a small group of ALS learners who were not included in the final sample to check item comprehensibility and to provide initial evidence of reliability. Internal consistency was assessed using Cronbach's alpha, and items that required refinement due to ambiguity or weak contribution to reliability were revised before full administration. Responses were coded numerically, summarized using mean scores, and interpreted based on the study's descriptive rating scale, thereby allowing the instrument to support both descriptive profiling and inferential analyses of the relationship between livelihood skills training and job readiness.

2.4 Data Analysis

Data analysis was conducted using a structured quantitative procedure aligned with the study's descriptive, correlational, and predictive objectives. After survey administration, completed questionnaires were checked for completeness and consistency, and responses were encoded into a statistical dataset for analysis. Data were screened to identify missing entries and potential outliers, and only usable responses that met the inclusion criteria were retained for final computation. All analyses were performed at the aggregate level to preserve participant confidentiality.

To address the study's descriptive objectives, frequency counts and percentages were computed for participant profile variables, including demographic characteristics and relevant background information. For the major study variables, namely livelihood skills training and job

readiness, weighted mean and standard deviation were calculated to describe the overall level and variability of respondents' perceptions. Mean scores were interpreted using the study's descriptive scale (e.g., low to very high), enabling a clear characterization of the extent to which learners perceived livelihood training provisions to be adequate and the extent to which they rated themselves as job-ready.

To examine relationships between livelihood skills training and job readiness, Pearson's product–moment correlation coefficient (r) was used to determine the strength and direction of association between the variables and their corresponding dimensions. Correlation analysis provided evidence on whether higher perceived levels of livelihood training were statistically related to higher levels of job readiness. Statistical significance was evaluated using a conventional alpha level, and correlation values were interpreted based on standard effect size conventions.

To further determine whether the dimensions of livelihood skills training predicted job readiness, the study used multiple linear regression. In the regression model, the livelihood skills training dimensions (e.g., instructional support, opportunities for practice, and availability of tools/materials) were entered as predictors, and the overall job-readiness score served as the dependent variable. Regression outputs—including the unstandardized coefficients (B), standardized coefficients (β), t-values, and associated p-values—were examined to identify significant predictors and to estimate the relative contribution of each training dimension to job readiness outcomes. Model fit indices, such as R^2, were used to evaluate the extent to which the predictor set explained variance in job readiness. Assumption checks relevant to regression (e.g., linearity, normality of residuals, and multicollinearity) were considered to support the validity of interpretation.

Overall, the combined use of descriptive statistics, correlation analysis, and regression modeling ensured that the study could both summarize ALS learners' livelihood training and job-readiness levels and provide empirical evidence on the extent to which livelihood training experiences are associated with and predictive of job readiness.

3. Results

Results indicated that ALS learners in SDO Urdaneta City reported a generally high level of livelihood skills training (overall WM = 3.86, SD = 0.69), suggesting that respondents perceived the livelihood component of ALS as relevant, structured, and adequately facilitated. Among the specific dimensions, relevance of training to local jobs/livelihood opportunities obtained the highest mean (WM = 4.12, SD = 0.62, High), followed by trainer support and guidance (WM = 4.05, SD = 0.59, High). These results imply that learners viewed the training as aligned with local economic opportunities and that facilitators provided consistent coaching and assistance. Other training quality indicators also fell within the High range, including adequacy of training content/modules (WM = 3.95, SD = 0.70), teaching strategies and hands-on activities (WM = 3.88, SD = 0.68), and assessment and feedback process (WM = 3.76, SD = 0.73). In contrast, the availability and usefulness of tools/materials received only a moderate rating (WM = 3.42, SD = 0.81), showing the lowest mean and the greatest variability across indicators. This suggests uneven access to equipment and materials across ALS learning centers, which may limit the depth of hands-on practice despite strong instructional delivery.

The findings further revealed that ALS learners demonstrated an overall high level of job readiness (overall WM = 3.74, SD = 0.70). The strongest readiness indicator was work values and habits (WM = 4.08, SD = 0.58, High), suggesting that learners perceived themselves as developing workplace behaviors such as responsibility, punctuality, discipline, and teamwork. Technical/occupational skill competence was also rated High (WM = 3.90, SD = 0.66), indicating that learners felt capable of performing livelihood-related tasks taught in ALS. Similarly, learners rated themselves high in communication and interpersonal skills (WM = 3.74, SD = 0.71)

and problem-solving and adaptability (WM = 3.62, SD = 0.73), reflecting readiness in essential employability skills. However, job-seeking/livelihood confidence registered only a moderate level (WM = 3.35, SD = 0.80) and showed the highest variability among the readiness dimensions. This indicates that while learners felt competent and value-ready, a meaningful portion were less confident in transitioning into actual employment or entrepreneurship.

Correlation analysis showed a statistically significant, high positive relationship between livelihood skills training and job readiness. The computed Pearson correlation coefficient was $r = 0.68$ ($p = 0.000$), indicating that learners who reported higher-quality livelihood skills training also tended to report higher job readiness. Given that the p-value was below the 0.05 significance threshold, the null hypothesis of no relationship was rejected. This result provides evidence that the quality of livelihood training is strongly associated with job-readiness outcomes among ALS learners in the study context.

Simple linear regression was conducted to determine whether livelihood skills training significantly predicted job readiness. Results indicated that livelihood skills training significantly predicted job readiness, with the model showing $R = 0.68$ and $R^2 = 0.46$. This means that livelihood skills training accounted for approximately 46% of the variance in job-readiness scores. The regression model was statistically significant ($F = 101.49$, $p = 0.000$), confirming that livelihood skills training is a reliable predictor of job readiness. The coefficients further showed a significant positive predictive effect ($B = 0.69$, $\beta = 0.68$, $t = 10.07$, $p = 0.000$), indicating that a one-unit increase in livelihood skills training corresponded to an estimated 0.69-unit increase in job readiness. These findings support the conclusion that strengthening livelihood skills training—particularly the weaker resource-related dimension (tools/materials) and transition-oriented readiness supports—would likely improve job readiness among ALS learners.

4. Discussion

This study examined the level of livelihood skills training and job readiness among Alternative Learning System (ALS) learners in SDO Urdaneta City. It determined whether livelihood skills training is associated with, and predictive of, job readiness. Overall, the findings provide strong evidence that ALS livelihood skills training is not only perceived as generally effective but is also meaningfully linked to learners' preparedness to participate in employment or livelihood activities. Specifically, learners reported high levels of livelihood skills training (WM = 3.86) and job readiness (WM = 3.74), and livelihood skills training demonstrated a strong positive correlation with job readiness ($r = 0.68$, $p < .001$). In addition, regression results indicated that livelihood skills training significantly predicted job readiness, explaining 46% of the variance in job readiness scores ($R^2 = 0.46$; $F = 101.49$; $p < .001$).

These findings align with the broader rationale for second-chance education programs: that they become more valuable when they strengthen learners' employability and livelihood capacity, particularly among out-of-school youth and adults who face economic and labor-market vulnerability (World Bank, 2018). Within ALS, livelihood skills training is expected to improve employability outcomes, and the present results provide empirical evidence of this relationship in the local context.

The high overall rating for livelihood skills training suggests that ALS learners generally perceived the livelihood component as relevant and well facilitated, particularly in terms of training relevance to local livelihood opportunities and trainer support. This is consistent with skills development frameworks, which emphasize that training programs are most useful when learning content aligns with realistic livelihood pathways and when delivery includes sustained guidance and learner support (UNESCO, 2022). For ALS learners, relevance and trainer support are especially important because adult and working learners often require instruction that is immediately applicable and practical, and they may require facilitation that accommodates diverse learning needs and constraints (World Bank, 2018).

However, the results also revealed a notable implementation constraint: the availability and usefulness of tools/materials received the lowest rating and was only moderate. This finding is critical because skills-based learning relies heavily on hands-on practice supported by adequate equipment and learning materials. The reported resource limitation reflects a broader pattern observed in ALS implementation assessments, which highlight variability in program delivery capacity and support mechanisms across learning environments (Muñoz, 2024). In practice, learners may perceive the training quality as high because the instruction and content are strong. Yet, their opportunities to gain full competency may be constrained if tools and materials are insufficient for repeated practice and mastery.

The overall high job readiness rating indicates that ALS learners perceived themselves as generally prepared for work or livelihood engagement, particularly in work values and habits, technical competence, and interpersonal skills. These outcomes are highly relevant to employability, as readiness for work is not limited to technical competency alone but includes behavioral and adaptive skills—such as responsibility, time management, and communication—that support retention and performance in real work settings. This finding also aligns with UNESCO's position that skills development should be understood as empowerment-oriented and employability-oriented, especially for marginalized learners transitioning into labor markets (UNESCO, 2022).

Nevertheless, the finding that job-seeking/livelihood confidence was only moderate suggests a meaningful gap between being "trained" and being "transition-ready." This gap aligns with broader evidence that skills systems often struggle to translate training into concrete labor market outcomes because learners may lack transition supports, such as career guidance, matching mechanisms, and access to information and networks (World Bank, International Labour Organization, & UNESCO, 2023). For ALS learners, who may have limited formal credentials and fewer labor-market connections, weaker job-seeking confidence can limit employability outcomes even when technical skill confidence is present. Therefore, ALS livelihood programming may require enhanced transition supports—such as job application coaching, interview preparation, entrepreneurship orientation, and referrals to local opportunities—to strengthen the pathway from training to actual employment or livelihood engagement.

The study's most consequential result is the strong relationship between livelihood skills training and job readiness. The correlation coefficient ($r = 0.68$) indicates that learners who reported better livelihood training experiences also tended to report higher levels of job readiness. Regression findings further confirm that livelihood skills training is a statistically significant predictor of job readiness, accounting for nearly half of the variance in readiness outcomes ($R^2 = 0.46$). This explanatory strength indicates that livelihood training is a central leverage point for ALS implementers aiming to improve employability-related outcomes.

From a systems perspective, these results support the argument that training effectiveness is not solely a matter of curriculum inclusion but depends on delivery quality and enabling conditions. Global analyses note that TVET systems and skills programs often face challenges, such as mismatched training content, insufficient practical training resources, and weak labor-market alignment, all of which affect the translation of training into employability outcomes (World Bank, International Labour Organization, & UNESCO, 2023). The present study's findings are consistent with these themes and suggest that strengthening ALS livelihood skills training—particularly by improving resource sufficiency (tools/materials) and enhancing transition-oriented supports—would likely increase job readiness among ALS learners.

The findings offer several implications for improving ALS programs. First, the high ratings for training relevance and trainer support indicate that existing delivery practices have strong foundations; these strengths should be maintained through continued facilitator development and consistent quality assurance across learning centers. Second, the moderate rating for tools and materials should be treated as a priority constraint, as inadequate equipment can reduce practical

mastery and hinder skills transfer to real work environments. Addressing this gap may require targeted resource mobilization, partnerships, and improved training resource management.

Third, the moderate level of job-seeking confidence suggests the need to expand livelihood programming beyond technical skills to include supports for transition and employability. This recommendation aligns with international guidance that skills programs must address labor-market matching, changing skill needs, and learner support mechanisms to reduce skill-to-employment mismatches (World Bank, International Labour Organization, & UNESCO, 2023). ALS may strengthen readiness outcomes by embedding structured job-search activities, entrepreneurship-readiness modules, linkages with local employers, and referrals to external skills-certification or placement-support systems.

Although the findings are robust, several limitations should be considered. The design is cross-sectional and non-experimental; therefore, causal conclusions cannot be drawn. Additionally, the study relied on self-reported measures, which may be influenced by social desirability bias and may not fully reflect objective job readiness outcomes. Future studies may incorporate objective indicators such as competency assessments, portfolio evaluation, employment placement rates, or livelihood income trajectories. Longitudinal designs would also be valuable for assessing whether training improvements lead to sustained readiness and actual labor-market participation over time.

In conclusion, ALS livelihood skills training was perceived as generally high and significantly associated with job readiness among ALS learners. The findings further demonstrate that livelihood skills training is a statistically significant predictor of job readiness, accounting for a substantial proportion of the variance in readiness. However, moderate ratings for tools/material availability and job-seeking confidence highlight actionable areas for program strengthening. Enhancing training resources and integrating employability transition supports may further improve ALS learners' readiness to pursue meaningful employment or sustainable livelihood opportunities.

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PROMOTING LIFELONG PHYSICAL ACTIVITY ENGAGEMENT THROUGH SCHOOL-BASED PHYSICAL EDUCATION PROGRAM

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Abstract

This study assessed the effectiveness of school-based physical education (PE) programs in promoting lifelong physical activity engagement among secondary school students. A quantitative descriptive–comparative design was employed. Data were gathered from 50 high school students enrolled in PE classes at Lyceum–Northwestern University, Dagupan City. A researcher-made questionnaire measured self-reported physical activity engagement, participation patterns, and physical interest, while standardized school-based physical fitness tests provided objective indicators of endurance, strength, flexibility, and agility. Students were grouped as consistent or irregular PE participants to examine differences in engagement and fitness performance.

Results showed a high level of participation in PE classes, particularly in regular attendance, teamwork, and interest during lessons. Engagement in physical activities outside regular school hours was slightly lower, indicating the need for continued encouragement beyond structured classes. Overall physical activity engagement remained high, reflecting frequent involvement, awareness of health benefits, and willingness to sustain an active lifestyle after PE completion. Consistent participants obtained significantly higher scores than irregular participants across all fitness components. A strong positive relationship was also found between physical activity engagement and physical fitness levels, suggesting that students who are more active and motivated tend to achieve better fitness outcomes.

The findings underscore the essential role of school-based PE in shaping active, health-conscious lifestyles and in building foundations for lifelong physical activity habits. An enhancement program is proposed emphasizing varied, enjoyable, inclusive, and lifestyle-oriented activities, supported by strengthened teacher strategies and expanded co-curricular opportunities to sustain student engagement beyond school.

Keywords: Physical Education; Lifelong Physical Activity; Student Engagement; Physical Fitness; Participation Consistency; High School Students

1. Introduction

Physical inactivity among adolescents has become a persistent public health and education concern worldwide and in the Philippines. Globally, the World Health Organization reported that about 81% of adolescents do not meet the recommended levels of physical activity (WHO, 2022). In the Philippine setting, this challenge is more alarming: national analyses indicate that Filipino adolescents are among the most physically inactive globally, with only a small proportion meeting activity guidelines (Cagas et al., 2022; Inquirer, 2022). Such patterns increase risks for non-communicable diseases, poor mental health outcomes, and reduced quality of life later in adulthood. Because activity behaviors established during adolescence often track into adulthood, schools are widely recognized as critical sites for shaping positive, lifelong physical activity habits (EBSCO, 2024; Standage et al., 2025). Consequently, school-based physical education (PE) is positioned not merely as a subject for skill performance but as a long-term investment in students' health trajectories.

In response, the Philippine Department of Education (DepEd) has institutionalized PE as a core component of the K to 12 Basic Education Program. The K to 12 PE Curriculum Guide explicitly frames fitness and movement education as its foundation, aiming to help learners achieve health-related fitness, develop self-management skills, and sustain physical activity participation beyond schooling (DepEd, 2016/2019). More recently, the MATATAG Curriculum further emphasizes that PE and Health should provide movement-based, enjoyable, and challenging experiences that cultivate the mindset and skills needed for lifelong participation in physical activity (DepEd, 2023). Alongside curriculum direction, DepEd reinforced assessment mechanisms to monitor fitness outcomes. DepEd Order No. 34, s. 2019 (Revised Physical Fitness Test Manual) mandates standardized fitness testing to generate baseline data, guide PE instruction, and strengthen holistic wellness among learners (DepEd, 2019). Moreover, DepEd Order No. 8, s. 2015 highlights that classroom assessment should support learners' transfer of knowledge and skills to future contexts, aligning PE assessment with lifelong learning goals rather than short-term performance alone (DepEd, 2015). Taken together, these policies signal DepEd's strong commitment to ensuring that PE becomes a pathway to active living across the lifespan.

Parallel evidence from international literature supports DepEd's policy direction. Studies grounded in Self-Determination Theory (SDT) consistently show that PE can increase students' long-term participation in physical activity when programs support autonomy, competence, and relatedness (Lee et al., 2021; Standage et al., 2025). For instance, systematic reviews demonstrate that autonomy-supportive PE teaching enhances students' intrinsic motivation and likelihood of engaging in physical activity outside school (Lee & Reeve, 2021; Standage et al., 2025). Likewise, perceived competence and enjoyment in PE predict adolescents' physical activity engagement years later, indicating that meaningful PE experiences contribute to lifelong habits (Kalaja et al., 2015; Shen et al., 2023). In addition, curricular approaches that move beyond traditional competitive sports toward lifestyle-based and culturally relevant activities are associated with higher participation and more sustainable intentions to engage in activity (Beni et al., 2022). Therefore, evidence suggests that PE has the potential to promote lifelong physical activity when delivered in inclusive, motivating, and relevant ways.

Despite these strengths, a clear gap remains between PE policy intentions and adolescents' real-world activity outcomes. The 2022 Philippine Physical Activity Report Card highlights low grades in overall adolescent physical activity and strong concerns about sedentary behavior, despite PE being embedded in the curriculum (Cagas et al., 2022). This mismatch suggests that while PE programs may be implemented, they do not always translate into sustained activity outside regular school hours. Additionally, participation in PE itself is uneven. Some students attend and engage consistently, but others participate irregularly due to motivational, environmental, or contextual barriers. International studies warn that PE that overemphasizes performance, grading, or competitive norms can alienate less-skilled learners and reduce their long-term engagement (Lee et al., 2021; Beni et al., 2022). Thus, the key issue is not simply whether PE exists, but whether the quality and consistency of student participation in PE effectively impact their physical activity engagement and physical fitness development.

In this context, there is a pressing need to examine how school-based PE participation relates to students' activity engagement and fitness outcomes within actual Philippine school settings. Specifically, comparing students who participate consistently versus irregularly can clarify whether regular PE participation produces meaningful differences in fitness and activity behaviors. Moreover, investigating students' physical interests and out-of-school activities can help determine whether PE is fostering intrinsic motivation and habits aligned with lifelong engagement, as envisioned by DepEd and supported by SDT research. Addressing these questions is particularly timely given DepEd's continued curriculum reforms toward holistic, lifelong learning through the MATATAG framework (DepEd, 2023).

Hence, this study, titled "Promoting Lifelong Physical Activity Engagement Through School-Based Physical Education Program," aims to assess the effectiveness of PE in encouraging sustained activity among high school students. Guided by DepEd policies and international evidence, it determines students' self-reported physical activity engagement, identifies their physical activities beyond class hours, evaluates fitness test performance between consistent and irregular PE participants, and examines the relationship between engagement and physical interest. Ultimately, this research seeks to generate evidence that can inform an enhancement program aligned with DepEd's curricular mandate for lifelong fitness, thereby strengthening PE's role as a foundation for active, healthy living throughout students' lives.

2. Method

2.1 Research Design

This study employed a quantitative descriptive–comparative research design to determine how participation in school-based physical education (PE) programs relates to students' physical activity engagement and physical fitness performance. The descriptive component documented students' self-reported levels of activity engagement, participation patterns in PE, and types of physical activities undertaken outside school hours, while the comparative component examined differences in standardized physical fitness test results between students who consistently participated in PE classes and those whose participation was irregular. Quantitative data were obtained through a researcher-made Likert-scale questionnaire and official school-based physical fitness assessments, enabling objective measurement of trends, relationships, and group differences. Using descriptive statistics and inferential tests (such as the independent samples t-test and correlation analysis), the design provided an empirical basis for evaluating PE's effectiveness in promoting lifelong physical activity engagement and for developing a proposed enhancement program grounded in the study's findings.

2.2 Participants

This study was fifty (50) high school students from Lyceum–Northwestern University, Dagupan City, who were officially enrolled in school-based physical education (PE) classes during the academic year of the study. These students were selected because they directly experienced the PE program implementation and could provide reliable self-reports of physical activity engagement, participation frequency, and physical interest. To enable comparative analysis, participants were categorized into two groups: those who consistently attended PE classes and those with irregular attendance, based on attendance and involvement records validated by MAPEH teachers and school documents. All participants voluntarily agreed to take part in the study and were assured of confidentiality and ethical protection throughout the data-gathering process.

2.3 Instrumentation

The study utilized two primary instruments for data collection: a researcher-made questionnaire and standardized physical fitness test results. The questionnaire, developed from relevant literature and aligned with the study objectives, consisted of sections on demographic profile, consistency of PE participation, self-reported physical activity engagement, types of activities performed outside school hours, and physical interest or motivation toward active living, with responses rated on a four-point Likert scale. To ensure validity and reliability, the instrument underwent expert content validation by MAPEH faculty members and a research methodologist, followed by pilot testing and reliability analysis through Cronbach's Alpha. In addition to the survey, official school-based physical fitness test scores—measuring endurance, strength, flexibility, and agility—were gathered from MAPEH teachers following standardized DepEd testing

protocols, providing objective indicators for comparing fitness performance between consistent and irregular PE participants.

2.4 Data Analysis

Data analysis began with the organization, coding, and encoding of all questionnaire responses and physical fitness test scores into SPSS or Microsoft Excel, followed by data cleaning to ensure completeness and accuracy. Descriptive statistics—frequency, percentage, mean/weighted mean, and standard deviation—were used to summarize students' demographic profile, determine the average self-reported level of physical activity engagement, and identify the common physical activities performed outside school hours, as well as to describe fitness performance levels of consistent and irregular PE participants. To test group differences in physical fitness outcomes, an independent-samples t-test was used to compare the mean fitness scores of consistent versus irregular participants at the 0.05 level of significance. Lastly, correlation analysis (e.g., Pearson's r) was employed to determine the strength and direction of the relationship between students' physical activity engagement and their level of physical interest, and the results were used to propose an enhancement program to promote lifelong physical activity engagement further.

3 Results

The results indicated that students demonstrated a generally high level of participation in school-based physical education (PE) programs. In particular, consistent attendance, active involvement during class activities, teamwork, and displayed interest were frequently observed and rated highly in the self-report data. Moreover, the mean self-reported level of physical activity indicated that most respondents were regularly active and were aware of PE's contribution to their health and well-being. However, despite strong participation within formal PE settings, engagement in physical activities outside regular school hours was slightly lower. This suggests that while PE effectively motivates students during class, additional support may still be needed to sustain activity in home and community contexts.

In terms of physical fitness performance, a clear difference emerged between students who consistently participated in PE classes and those who did so irregularly. Specifically, consistent participants achieved higher mean scores across all standardized fitness components, including endurance, muscular strength, flexibility, and agility. These findings suggest that regular participation in structured PE activities positively affects students' physical development and overall fitness. Conversely, irregular participants—although still benefiting from PE—performed comparatively worse, highlighting the importance of consistent participation for maximizing fitness outcomes.

Finally, correlation analysis revealed a strong positive relationship between students' physical activity engagement and their level of physical interest. In other words, students who reported greater enjoyment, motivation, and interest in PE and physical activities were also more likely to engage frequently in physical activity and attain better fitness results. Taken together, these results emphasize that consistent PE participation strengthens fitness performance. At the same time, high physical interest serves as an important driver of sustained engagement—both of which support the broader goal of promoting lifelong physical activity habits among students.

4. Discussion

The present study's finding that students exhibited a high level of participation in school-based PE classes corroborates a broad body of literature showing that regular PE exposure is strongly associated with positive health and activity-related outcomes. International evidence from multi-country adolescent datasets indicates that higher PE attendance is associated with a greater likelihood of meeting recommended physical activity levels, suggesting that PE lessons offer

essential in-school opportunities for movement and habit formation (Guthold et al., 2020; Silva et al., 2020). In the Philippine context, this aligns with DepEd's K to 12 and MATATAG curricular directions, which position PE as a core learning area to cultivate active lifestyles and health-related fitness competencies (Department of Education [DepEd], 2023). Thus, the consistently high PE participation observed in this study supports the policy assumption that schools remain a practical and effective entry point for engaging adolescents in structured physical activity and for initiating lifelong fitness orientation.

However, the study also revealed that students' engagement in physical activity outside regular school hours was comparatively lower, and this pattern is similarly reflected in national and international reports. The 2022 Philippine Physical Activity Report Card notes that a large majority of Filipino adolescents do not meet daily activity recommendations, despite PE being part of the basic education curriculum (Cagas et al., 2022). Likewise, global surveillance data show that school-based activity alone often cannot offset sedentary lifestyles if home and community environments do not support continued participation (WHO, 2022). Therefore, the current result reinforces the literature's argument that PE must be intentionally linked to leisure-time and lifestyle-based activities, rather than confined to classroom requirements, if it is to fulfill its lifelong engagement mandate (Beni et al., 2022; Standage et al., 2025).

Moreover, the significant fitness advantage of consistent PE participants over irregular participants strongly supports previous findings that participation frequency matters in producing measurable fitness gains. Studies across different settings report that students who attend PE more regularly demonstrate better endurance, strength, flexibility, and agility than those with minimal or inconsistent participation (Hollis et al., 2017; Silva et al., 2020). This directly mirrors DepEd Order No. 34, s. 2019, which institutionalizes standardized fitness testing precisely because consistent engagement in PE is expected to improve health-related fitness and guide instruction for wellness outcomes (DepEd, 2019). Hence, the observed group differences validate both the empirical literature and DepEd's rationale for monitoring fitness performance as a school-based indicator of healthy development.

In addition, the study's strong positive relationship between physical activity engagement and physical interest levels aligns with motivation-based theories and research, particularly Self-Determination Theory and the trans-contextual model. Systematic reviews show that when PE supports autonomy, competence, and relatedness, students develop stronger intrinsic motivation, which then predicts sustained out-of-school activity and long-term adherence to exercise (Lee et al., 2021; Lee & Reeve, 2021). Intervention studies likewise demonstrate that autonomy-supportive teaching in PE increases students' leisure-time motivation and physical activity behavior beyond school (Hagger & Chatzisarantis, 2016; Sun et al., 2021). Consequently, the current finding implies that interest and motivation are not mere byproducts of PE participation but key mechanisms through which PE influences lifelong engagement, reinforcing DepEd Order No. 8, s. 2015, which emphasizes assessment for learning and the transfer of competencies to real-life contexts (DepEd, 2015).

Finally, taken together, the study's results reinforce the wider conclusion in the literature that PE is most effective for lifelong physical activity promotion when it is consistent, enjoyable, inclusive, and connected to real-world movement opportunities. Scholars argue that PE programs overly centered on performance or competitive sports may discourage less-skilled learners and fail to translate into lifelong activity habits; conversely, diverse, lifestyle-oriented, and autonomy-supportive programs improve both fitness outcomes and long-term engagement (Beni et al., 2022; Standage et al., 2025). In this sense, the proposed enhancement program arising from the present study is well grounded in both policy and research: it answers the national call to strengthen PE as a wellness foundation (DepEd, 2019, 2023) while also reflecting global evidence that motivation, consistency, and relevance are the strongest predictors of lifelong physical activity.

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IMPACT OF NUTRITION AND HEALTH STATUS ON CLASSROOM PERFORMANCE OF PHYSICAL EDUCATION TEACHERS IN PUBLIC SCHOOLS

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Abstract

This study examined how nutritional status and health status influence the classroom performance of Physical Education (PE) teachers at Mapandan National High School. Using a quantitative correlational design, all PE teachers in the school (N = 25) were included through total population sampling. Nutritional status was described through body mass index (BMI) and dietary habits, while health status was assessed through self-reported energy levels and absenteeism. Classroom performance was obtained from teachers' official performance ratings and related indicators of lesson preparation, instructional delivery, and classroom management. Descriptive statistics (frequency, percentage, and weighted mean) summarized the variables, while Pearson product–moment correlation tested relationships at the 0.05 level of significance.

Results showed that most teachers had normal BMI, with smaller proportions classified as underweight, overweight, or obese. Dietary habits and overall health status were rated high, indicating generally favorable nutrition practices, strong energy and endurance, and low absenteeism. Classroom performance was likewise high (overall $M \approx 4.37$). Correlation analysis revealed a significant moderate positive relationship between nutritional status and classroom performance ($r = 0.52$, $p = 0.03$) and a significant strong positive relationship between health status and classroom performance ($r = 0.68$, $p < 0.01$). These findings suggest that PE teachers who maintain healthier nutritional profiles and better health conditions tend to demonstrate higher classroom effectiveness.

Based on the results, a wellness program emphasizing nutrition education, regular physical activity, stress management, and periodic health monitoring is proposed to sustain and further improve PE teachers' well-being and teaching performance.

Keywords: Nutritional Status, Health Status, Body Mass Index, Dietary Habits, Energy Level, Absenteeism, Classroom Performance, Physical Education Teachers

1. Introduction

Health and nutrition are foundational to human functioning and work productivity. A healthy diet protects against malnutrition and noncommunicable diseases, supports energy balance, and maintains the physical capacity needed for daily tasks (World Health Organization [WHO], 2020). Likewise, regular physical activity and good health are associated with better brain function, memory, and concentration—skills that are directly relevant to teaching and classroom decision-making (Centers for Disease Control and Prevention [CDC], 2025). In school settings, these realities matter because teachers' physical and mental conditions shape their consistency at work, their stamina for instruction, and ultimately their effectiveness in delivering lessons. Recent literature underscores that teachers face significant health risks related to occupational stress and burnout, which are linked to poorer physical well-being and work functioning (Naghieh et al., 2022; Pressley, 2021). When teachers are unwell, performance can decline through fatigue, reduced instructional energy, and absenteeism.

Physical Education (PE) teachers occupy a particularly demanding role within this context. Their work requires sustained movement, demonstration of physical skills, and real-time supervision of active learners. Beyond teaching content, they serve as visible role models of

healthy lifestyles for students. Studies focusing on PE educators emphasize that ideal nutritional status strengthens professional competence and credibility, because teachers who display healthy weight and habits tend to model fitness more effectively and reinforce health behaviors in learners (Norfai et al., 2023). Conversely, abnormal nutritional status—such as underweight or overweight BMI—can be associated with physical limitations, reduced endurance, and health complications that may interfere with performance in physically intensive teaching environments (Norfai et al., 2023). A related study among school professionals found that BMI and nutrition-related knowledge are correlated with job performance, suggesting that healthier body weight and better dietary practices may translate into stronger work outcomes (Al-Mohaimeed et al., 2024). These findings suggest that nutrition is not simply a personal matter for PE teachers; it is an instructional issue that can influence teacher effectiveness and learner experience.

Health status complements nutrition in shaping performance. Teachers with higher energy levels and fewer illness-related absences are more likely to sustain quality teaching over time. In contrast, frequent absenteeism disrupts lesson continuity, reduces student learning opportunities, and often reflects deeper physical or mental health strain (Biasi et al., 2025; Pressley, 2021). Absenteeism is also increasingly understood as connected to job stress and burnout, which are prevalent in the teaching profession worldwide (Naghieh et al., 2022; Zee & Koomen, 2016). For PE teachers, whose delivery depends on physical presence and vigor, even short-term reductions in health can be especially consequential. Thus, assessing health through indicators such as energy levels and absenteeism is a meaningful way to gauge how well teachers meet the daily demands of PE instruction.

In the Philippine public-school system, teacher wellness is an explicit institutional concern. The Department of Education (DepEd) has expanded health-promoting initiatives such as the Healthy Learning Institutions (HLI) program and Oplan Kalusugan sa DepEd, reflecting a national push to create healthier school environments through nutrition education, physical activity, and preventive health services (Department of Education, 2022; Magsambol, 2025). While these programs are often framed around learner well-being, they also imply the need for teacher wellness, since educators implement and model these health standards. Filipino principals and schools have likewise explored wellness programs for teachers, emphasizing nutrition awareness, fitness activities, and health monitoring as pathways to sustain teacher productivity (Delos Reyes & Toreno, 2021). However, many school-based efforts still rely on general assumptions about health and performance rather than data that identify which wellness factors most strongly relate to effective teaching in specific contexts.

Despite growing attention to teacher wellness, empirical local research linking PE teachers' nutrition and health status to their classroom performance remains limited, especially in smaller public secondary schools. Most studies in the Philippines focus broadly on teacher stress or wellness perceptions, with fewer examining measurable indicators such as BMI, dietary habits, energy levels, and absenteeism as predictors of instructional performance. This gap matters because PE teachers operate in a uniquely physical teaching space where nutrition- and health-related risks may have more precise and more immediate effects on classroom functioning than in less physically demanding subjects. Without localized evidence, school leaders may find it difficult to prioritize wellness strategies or justify program resources.

To address this need, the present study investigated the nutritional and health status of PE teachers in Mapandan National High School and examined their relationships with classroom performance. BMI and dietary habits assessed nutritional status, while energy levels and absenteeism measured health status. Classroom performance was assessed using teachers' official performance ratings and classroom-related indicators. By determining whether and how nutrition and health relate to PE teachers' effectiveness, the study provides an evidence base for practical interventions. Specifically, the findings are intended to guide the development of a contextualized wellness program that supports PE teachers' health and, by extension, improves

instructional quality and student outcomes. In line with DepEd's broader health agenda, such evidence-based wellness planning contributes to strengthening both teacher well-being and school performance.

2. Method

2.1 Research Design

The study employed a quantitative correlational research design to determine the strength and direction of relationships among the variables without manipulating them. Specifically, it quantified Physical Education teachers' nutritional status (using BMI and dietary habits) and health status (energy level and absenteeism), and examined how these relate to classroom performance ratings. By collecting standardized numerical data through questionnaires, BMI computation, and existing performance records, and analyzing them using descriptive statistics and Pearson product–moment correlation at the 0.05 level of significance, the design allowed the researcher to describe current conditions and test whether variations in nutrition and health are significantly associated with variations in teaching performance in the natural school setting.

2.2 Participants

The study included the entire group of Physical Education (PE) teachers assigned to Mapandan National High School during the research. A total population sampling technique was used, meaning all available PE teachers in the school (N = 25) were included rather than selecting a subset, to ensure full representation of the target group within the locale. These participants served as the primary sources of data on nutritional status (BMI and dietary habits) and health status (energy level and absenteeism). In contrast, their classroom performance levels were obtained from their official school-based performance ratings and related indicators, enabling the study to examine relationships among variables within the school's actual teaching population.

2.3 Instrumentation

The study utilized three main instruments consistent with its quantitative correlational design: a nutritional status instrument, a health status instrument, and a classroom performance measure. Nutritional status was determined through (1) Body Mass Index (BMI) computation based on the teachers' measured height and weight using the standard BMI formula and classification, and (2) a structured dietary habits questionnaire rated on a Likert scale to describe eating patterns. Health status was assessed using a researcher-administered Likert-type survey focusing on two indicators: self-reported energy level/endurance, and the frequency of absenteeism due to health reasons. Classroom performance was obtained from the teachers' official school performance ratings and related evaluation indicators (e.g., lesson preparation, instructional delivery, and classroom management). Together, these instruments generated numerical data that enabled descriptive analysis of PE teachers' nutrition, health, and performance levels and supported Pearson correlation testing of their relationships.

2.4 Data Analysis

The study used a quantitative correlational approach, first summarizing each variable descriptively and then testing relationships inferentially. Teachers' BMI categories were analyzed using frequency counts and percentages to describe the distribution of nutritional status. In contrast, dietary habits, health status (energy level and absenteeism), and classroom performance were analyzed using weighted means and corresponding descriptive labels based on the Likert scale. After establishing the levels of each variable, Pearson product–moment correlation (r) was applied to determine the strength and direction of the relationships between nutritional status and classroom performance and between health status and classroom

performance, with significance tested at the 0.05 alpha level. This combination of descriptive and correlational statistics provided both a clear profile of participants' nutrition, health, and performance and an evidence-based basis for concluding whether these factors were significantly associated.

3 Results

The results showed that the Physical Education teachers generally demonstrated a favorable nutritional status. Based on Body Mass Index (BMI) classifications, the largest proportion of respondents fell within the normal range, while smaller groups were categorized as underweight, overweight, or obese. This overall pattern indicates that most teachers maintain body weight appropriate for their height, consistent with the physical demands of their role. However, the presence of teachers outside the normal range suggests that nutrition-related risks remain within the group and should not be overlooked, especially given that PE teachers' work requires sustained physical activity and stamina.

Regarding dietary habits, the teachers received a descriptive rating of "High," indicating generally positive eating practices. The responses indicated that most teachers frequently consumed balanced meals and were mindful of food choices that support energy and health. Taken together with the BMI findings, these results imply that the respondents exhibit nutrition behaviors that are largely supportive of good physical functioning, though targeted support may still be needed for those with less optimal nutritional profiles.

Health status findings also revealed an overall "High" level. Teachers reported strong energy levels and endurance suitable for PE instruction, and absenteeism due to health-related reasons was low. This suggests that most respondents are physically capable of fulfilling daily teaching demands and are not frequently hindered by illness. High energy and low absenteeism are important indicators of functional health, particularly for PE educators who must actively demonstrate skills and supervise dynamic activities.

Classroom performance results likewise indicated a "High" level of effectiveness among PE teachers, with an overall mean around 4.37. Teachers scored strongly in key areas such as lesson preparation, instructional delivery, and classroom management. This reflects consistent competence in organizing PE lessons, facilitating student engagement in physical activities, and maintaining a productive learning environment, aligning with expected professional standards for public school teachers.

Finally, correlation analysis established statistically significant positive relationships between the independent variables and classroom performance. Nutritional status showed a moderate but significant correlation with performance ($r = 0.52$, $p = 0.03$), implying that better nutrition is associated with improved classroom effectiveness. Health status demonstrated a stronger, significant correlation with performance ($r = 0.68$, $p < 0.01$), indicating that teachers with higher energy levels and fewer absences tend to perform more effectively. These results highlight that while both nutrition and health matter, overall health condition—especially energy and attendance—appears to be the more powerful predictor of PE teachers' classroom performance, supporting the need for a wellness program focused on sustaining both healthy eating and robust physical well-being.

4. Discussion

The present study's finding that PE teachers generally manifested normal BMI and high dietary-habit ratings corroborates evidence that many teachers maintain acceptable nutritional profiles, especially when they possess stronger nutrition knowledge and healthier behaviors. For instance, Al-Mohaimeed et al. (2024) reported that teachers with better nutrition knowledge tended to have healthier BMI patterns and were more productive at work, supporting the idea that nutrition-related competence and habits are linked to optimal body status and work functioning.

Similarly, a large cross-sectional study among primary school teachers found meaningful associations between health behaviors (including diet and physical activity) and BMI, emphasizing that lifestyle practices help explain teachers' nutritional condition (Alwabli et al., 2024). These aligned results suggest that the predominantly normal BMI and healthy dietary habits observed in Mapandan National High School are consistent with broader patterns in teacher populations, while also highlighting that a subset of overweight/obese teachers remains a common concern.

The study's results on health status—high energy levels and low absenteeism—also parallel prior research that frames teachers' physical well-being as a determinant of work capacity. A systematic review on teacher burnout and physical health concludes that teaching is associated with multiple physical health risks, and that better well-being is linked with stronger functional outcomes (Edwards et al., 2023). Relatedly, evidence from secondary public school teachers indicates that healthier physical activity patterns mitigate stress and are associated with better perceived health and functional capacity (Aparicio-Ugarriza et al., 2024). Taken together, these studies support the interpretation that PE teachers who sustain robust energy and physical health are more able to meet instructional demands, consistent with the high health-status ratings found in this research.

A key corroborating point is the significant positive link between nutrition and classroom performance. The moderate correlation in the present study mirrors findings that teachers' diet quality is meaningfully associated with their classroom practices and professional behaviors. For example, Dalton et al. (2020) found that teachers with higher-quality diets were more likely to model healthier behaviors and engage in supportive nutrition-related classroom practices, suggesting that better personal nutrition is associated with stronger professional performance. At the systems level, CDC guidance on school nutrition and physical-activity environments similarly notes that healthier staff behaviors and knowledge are tied to improved school functioning and role modeling, reinforcing the plausibility of nutrition as a contributor to teaching effectiveness (CDC, 2023).

The stronger relationship observed between health status and classroom performance is also strongly supported in the literature. Teacher absenteeism research consistently shows that health-related absences disrupt instruction and are often rooted in well-being strain; chronically absent teachers are more likely to report mental- or health-related reasons for missed work (Biasi et al., 2024). Policy and research syntheses further emphasize that teacher absences reduce instructional continuity and undermine student learning, underscoring attendance as a practical indicator of teacher effectiveness (Miller, 2019). These studies align with the present finding that energy and consistent attendance are powerful predictors of PE teachers' classroom performance.

Finally, the proposed wellness program emerging from this study aligns with prior evidence that teacher-focused wellness and physical activity initiatives can improve work-related outcomes. A sports-based physical-activity program for teachers highlighted that improving teacher wellness is directly connected to teaching performance and school stability (Kim & Lee, 2020). Likewise, studies on school wellness initiatives report that strengthening nutrition, physical activity, and stress management among teachers supports both personal health and their capacity to implement wellness practices in class (Elliott et al., 2022). Thus, the present study's recommendation for a structured wellness program is consistent with established research advocating integrated nutrition-and-health interventions to sustain teacher performance.

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STRUCTURED PHYSICAL ACTIVITY AND ITS INFLUENCE ON THE ACADEMIC ACHIEVEMENT OF GRADE 7 SPECIAL PROGRAM IN SPORTS LEARNERS

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Abstract

This study examined the effect of Structured Physical Activity (SPA) implemented through the Special Program in Sports (SPS) on the academic achievement of Grade 7 learners. Using a quasi-experimental pretest–posttest design, 121 SPS students from selected public secondary schools participated in an SPA regimen characterized by monitored duration, intensity, and perceived exertion. Academic performance in Mathematics, Science, and English was measured through teacher-made achievement tests administered before and after the intervention. Descriptive statistics summarized SPA exposure, paired-samples t-tests examined changes in academic scores, and Pearson r explored relationships between SPA indicators and achievement gains. Results showed consistent posttest improvements across subjects, with mean increases of about five points per area. The pretest–posttest difference was statistically significant ($t = 4.32$, $p < .0001$), indicating that SPA contributed to higher academic achievement. Learners engaged in SPA for an average of 7.2 hours per week at moderate-to-vigorous levels (mean Borg RPE = 3.8). Both SPA duration ($r = 0.38$, $p = .004$) and intensity ($r = 0.42$, $p = .001$) were positively associated with academic gains. Findings support Social Cognitive Theory and Cognitive Load Theory by suggesting that appropriately dosed physical activity enhances attention, self-efficacy, and classroom learning. The study recommends sustaining SPA within SPS while ensuring balanced academic schedules and monitoring training intensity to maximize scholastic benefits. These results highlight SPA as a school-based strategy for improving learner outcomes. Coaches and teachers may use guidelines on time allotment, progressive overload, and study–training balance to protect well-being and safely prevent academic trade-offs.

Keywords: Structured Physical Activity, Special Program In Sports, Academic Achievement, Grade 7 Learners, Quasi-Experimental Design, Exercise Intensity

1. Introduction

Physical activity is widely recognized as essential to adolescents' physical health, psychosocial development, and school engagement. In recent years, research has moved beyond the health lens to ask whether physical activity—primarily when structured and embedded in the school day—can also support learning and academic achievement. Multiple systematic reviews and meta-analyses report small-to-moderate positive effects of school-based physical activity interventions on students' cognitive outcomes and academic performance, particularly when activities are sustained and of adequate intensity (He et al., 2025; Singh et al., 2019; Vetter et al., 2023). These findings are important for schools that aim to develop both athletic and academic potential. However, they also raise practical questions about how much activity is beneficial, what intensity matters most, and whether time devoted to sport might compete with classroom learning.

Evidence from global literature indicates several pathways through which physical activity may enhance academic achievement. Physiologically, moderate-to-vigorous activity increases cerebral blood flow, neurotrophic factors, and neurotransmitter regulation that are associated with improved attention, memory, and executive functioning (Singh et al., 2019; Vetter et al., 2023). Psychologically, participation in organized sport can build discipline, goal orientation, and persistence, which may translate into more effective study behaviors (He et al., 2025). In

classrooms, learners who engage in regular physical activity often show better on-task behavior, reduced stress, and higher readiness to learn (He et al., 2025). Despite these promising mechanisms, prior reviews emphasize that benefits depend on the activity's dose, type, and context, suggesting that outcomes are not guaranteed across all programs (He et al., 2025; Vetter et al., 2023).

The present study is anchored on Social Cognitive Theory (SCT) and Cognitive Load Theory (CLT) to explain why structured physical activity may influence scholastic outcomes. SCT posits that behavior is shaped through reciprocal interactions among personal factors (e.g., self-efficacy), environmental supports, and modeled practices (Bandura, 1986; Young et al., 2025). In sport-focused school programs, learners acquire performance routines, observe peers and coaches, and receive feedback that strengthens self-regulation and confidence—traits also needed for academic tasks. Thus, SCT suggests that structured physical activity can improve academic achievement indirectly by enhancing motivation, perceived competence, and persistence in learning (Young et al., 2025). CLT, on the other hand, argues that learning depends on the efficient use of limited cognitive resources. When learners are mentally fatigued, stressed, or inattentive, extraneous cognitive load increases, reducing working memory capacity for instruction. Regular structured activity may reduce such overload by improving arousal regulation and executive control, thereby helping students process academic content more efficiently (Singh et al., 2019; Vetter et al., 2023).

In the Philippine basic education context, these theoretical expectations are particularly relevant for learners enrolled in the Special Program in Sports (SPS). The SPS is a Department of Education initiative designed to nurture talented student-athletes in regular public high schools through specialized sports training while maintaining the required academic curriculum (Department of Education [DepEd], 2015). SPS learners typically participate in systematic training sessions several times per week, guided by trained teachers-coaches and supported with facilities and equipment as prescribed by program guidelines (DepEd, 2015). Schools offering SPS aim to produce competitive athletes without sacrificing learners' academic growth. However, in practice, educators and parents often express concern that increased training hours and competitive demands may reduce time for study and rest, potentially affecting grades. International reviews similarly caution that poorly managed programs may result in fatigue or academic stress if activity volume and scheduling are not balanced with learning needs (He et al., 2025).

Although the global evidence base is strong, fewer empirical studies have examined structured physical activity within formal sports specialization programs in Philippine public schools, especially at the junior high school entry level. Grade 7 is a critical transition year in which adolescents adjust to higher academic expectations while undergoing rapid physical and social changes. For SPS learners, this transition includes adapting to intensified sports training alongside new subject demands. Local school-based data are needed to determine whether structured physical activity in SPS settings benefits or hinders academic achievement, and to identify which dimensions of activity (e.g., duration and intensity) are most associated with learning gains. Monitoring activity intensity is also crucial; the Borg Rating of Perceived Exertion (RPE) scale is a validated method for estimating perceived training load and guiding safe, developmentally appropriate exercise levels in youth (Cleveland Clinic, 2023; Shirley Ryan AbilityLab, 2018). Using such monitoring can help schools interpret whether learners' activity exposure reaches cognitive-beneficial thresholds described in prior studies (He et al., 2025; Singh et al., 2019).

Given these considerations, this study investigated the effect of structured physical activity (SPA) implemented through the SPS on the academic achievement of Grade 7 learners. Specifically, it examined (a) the learners' SPA exposure in terms of training duration, intensity, and perceived exertion; (b) differences in pretest and posttest academic performance in Mathematics, Science, and English; and (c) the relationship between SPA indicators and

achievement gains. By employing a pretest–posttest quasi-experimental approach and integrating SCT and CLT perspectives, the study addresses the need for contextualized evidence on how sports specialization programs can support both athletic excellence and scholastic success. Findings are expected to inform SPS coordinators, teachers, coaches, and policy implementers on appropriate activity dosing and scheduling strategies that maximize cognitive and academic benefits while preventing potential trade-offs. Ultimately, the study contributes to strengthening school-based sports programs as holistic pathways for learner development in the Philippine public education system.

2. Method

2.1 Research Design

The study employed a quasi-experimental one-group pretest–posttest research design, suitable for describing an intervention's effect in a real school setting where random assignment is not feasible. This design involved administering teacher-made achievement tests in Mathematics, Science, and English to Grade 7 learners enrolled in the Special Program in Sports (SPS) before the Structured Physical Activity (SPA) regimen (pretest) and again after a defined training period (posttest), while systematically monitoring SPA duration, intensity, and perceived exertion. Paired-samples t-tests were used to determine whether statistically significant differences existed between pretest and posttest scores, and Pearson correlation analyses examined the relationships between SPA indicators and academic gains.

2.2 Participants

The participants of the study were 121 Grade 7 learners officially enrolled in the Special Program in Sports (SPS) in selected public secondary schools, chosen through purposive sampling to ensure that all respondents were actively engaged in structured sports training as required by the program. These participants represented the target population of junior high school student-athletes at the entry level of SPS, making them appropriate for examining how Structured Physical Activity (SPA) influences early secondary academic performance. All learners participated in the same monitored SPA regimen, and their academic achievement in Mathematics, Science, and English was measured through pretest and posttest assessments, allowing for within-group changes attributable to SPA exposure and enabling the interpretation of outcomes in relation to the characteristics and training context of SPS student-athletes.

2.3 Instrumentation

The study used two main instruments to collect the required data: a structured physical activity monitoring tool and academic achievement tests. SPA exposure was documented through a researcher-prepared monitoring checklist that recorded training duration (hours per week), intensity level, and perceived exertion using the Borg Rating of Perceived Exertion (RPE) scale, allowing a systematic description of learners' physical activity dose across the intervention period. Academic achievement in Mathematics, Science, and English was measured through teacher-made, curriculum-aligned achievement tests administered as pretests and posttests; these tests were validated by subject experts to ensure content relevance and were used to quantify changes in performance attributable to SPA participation. Together, these instruments provided both objective indicators of SPA engagement and reliable baseline-to-outcome academic measures needed for the study's statistical analyses.

2.4 Data Analysis

The study involved both descriptive and inferential statistics to address the research questions. First, descriptive measures such as frequency counts, means, and standard deviations

were computed to summarize the learners' Structured Physical Activity (SPA) exposure in terms of duration (hours per week), intensity, and perceived exertion using the Borg Rating of Perceived Exertion (RPE) scale, as well as to describe pretest and posttest achievement levels in Mathematics, Science, and English. Next, a paired-samples t-test was conducted to determine whether there was a statistically significant difference in learners' pretest and posttest academic scores after participating in SPA. Finally, Pearson product–moment correlation (r) was used to examine the strength and direction of relationships between SPA indicators (duration and intensity) and the magnitude of academic achievement gains, allowing the study to infer whether higher activity dose was associated with better scholastic outcomes.

3. Results

The study first described learners' exposure to Structured Physical Activity (SPA) during the intervention. Grade 7 Special Program in Sports (SPS) learners participated in SPA at a generally adequate dose for school-based training, averaging about 7.2 hours of activity per week. Perceived exertion ratings clustered within the moderate-to-vigorous range (mean Borg RPE ≈ 3.8), indicating that most sessions required sustained physical effort rather than light recreational movement. These descriptive findings established that the intervention was implemented with sufficient duration and intensity to test its expected academic effects.

Next, the study presented the pretest and posttest academic achievement levels in Mathematics, Science, and English. Across all three subjects, learners' posttest scores were higher than their pretest scores, showing consistent improvement following SPA participation. Mean gains were roughly five points per subject, suggesting that academic growth occurred not only in one learning area but across core domains. This pattern suggests that the benefits of SPA were not discipline-specific but may have supported general cognitive and learning processes relevant across multiple disciplines.

To determine whether these improvements were statistically meaningful, a paired-samples t-test compared pretest and posttest scores. Results showed a significant difference in overall academic achievement after the SPA regimen ($t = 4.32$, $p < .0001$). This indicates that the observed increase in scores was unlikely due to chance alone and supports the claim that structured sports-based activity contributed to improved academic performance among SPS learners during the study period.

The study also examined whether specific SPA indicators were associated with the magnitude of academic gains. Pearson correlation analysis revealed positive, significant relationships between SPA duration and achievement improvement ($r = 0.38$, $p = .004$) and between SPA intensity and improvement ($r = 0.42$, $p = .001$). These correlations suggest a dose–response trend: learners who trained longer and/or at higher intensities tended to show greater academic progress, reinforcing the idea that not just participation but also the quality and volume of activity matter for scholastic outcomes.

4. Discussion

The findings of this study corroborate a growing body of evidence that school-based, structured physical activity can improve learners' academic achievement. The significant pretest–posttest gains observed among Grade 7 SPS learners align with recent meta-analytic work indicating that physical activity interventions in school settings produce small-to-moderate positive effects on academic outcomes, especially when implemented consistently and at sufficient intensity (He et al., 2025; Vetter et al., 2023). In particular, these reviews highlight that programs integrating regular activity into school routines tend to yield measurable improvements in core subject performance, supporting the present study's across-subject gains in Mathematics, Science, and English.

This study's dose–response pattern—where higher SPA duration and intensity are associated with larger academic gains—also echoes findings from the broader physical activity literature, emphasizing the importance of moderate-to-vigorous physical activity (MVPA). A recent meta-analysis of MVPA interventions reports that MVPA shows a clearerpositive association with school performance than light activity, suggesting that cognitive benefits depend partly on reaching adequate physiological thresholds (Meta-analysis of MVPA intervention, 2024). Similarly, longitudinal evidence indicates that adolescents who sustain MVPA over time show stronger academic and cognitive profiles, reinforcing the present result that students with greater training exposure tend to perform better academically (Longitudinal Effects of MVPA, 2024). In short, the current findings support the idea that *how much* and *how hard* learners train matter for scholastic benefits.

The present outcomes are likewise consistent with studies on organized sports participation and adolescent school success. Research on adolescents involved in structured team sports shows that participation is associated with better grades, stronger school attachment, and improved goal-setting—factors often proposed as mediators between athletics and learning (Does Participation in Organized Sports…, 2016). These parallels lend support to the study's Social Cognitive Theory framing: SPS training environments provide modeling, feedback, and mastery experiences that can build self-efficacy and persistence, which may transfer to academic tasks. The positive academic shifts in this study, therefore, mirror international findings that structured sport can reinforce behaviors and mindsets beneficial for classroom performance.

At the cognitive level, this study also matches evidence that exercise enhances functions directly tied to learning. A recent adolescent-focused systematic review found that exercise interventions improve executive function, attention, and working memory—domains strongly linked to academic achievement (Frontiers in Psychology, 2025). These mechanisms align with the study's Cognitive Load Theory explanation: regular SPA may reduce cognitive fatigue and optimize attentional resources, allowing learners to handle instructional demands more efficiently. Thus, the significant academic improvements seen after SPA are consistent with neurocognitive research showing that physical activity can act as a catalyst for better learning readiness and information processing.

Finally, within the Philippine SPS context, the results complement local scholarship stressing the importance of structured sports programs that support student-athletes holistically. While much local research has focused on SPS implementation and athlete performance, emerging work notes that student-athletes' academic outcomes improve when training is organized and supported by school structures that promote balance (Student-Athletes Related Factors…, 2022). This local alignment strengthens the relevance of the present study, suggesting that SPS can be a dual-development pathway when SPA is monitored and scheduled responsibly. Taken together, international and local evidence converge with the current findings: structured, moderate-to-vigorous physical activity—when balanced with academics—can enhance, rather than undermine, learner achievement.

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INSTRUCTIONAL LEADERSHIP PRACTICES OF SCHOOL HEADS IN THE MUNICIPALITY OF CALASIAO: BASIS FOR A MANAGEMENT ENHANCEMENT PLAN

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Abstract

This study examined the instructional leadership practices of public elementary school heads to inform the development of a management enhancement plan. Using a quantitative descriptive-comparative design, data were gathered through a structured survey questionnaire aligned with key instructional leadership domains: defining the school mission, managing the instructional program, and promoting a positive school learning climate. A census approach (complete enumeration) was employed to include all eligible public elementary school heads in the locale. Descriptive statistics were used to determine respondent profiles and the level of instructional leadership practices across domains. An inferential analysis using the independent-samples t-test was conducted to determine whether instructional leadership practices differed significantly across groups defined by selected profile variables.

Findings revealed that school heads demonstrated generally high to very high levels of instructional leadership practice across domains. Defining the school mission and promoting a positive school learning climate emerged as the strongest domains, indicating consistent emphasis on goal setting, shared vision, and supportive teaching–learning conditions. The instructional program, while still rated high, received the lowest comparative rating, suggesting a priority area for improvement in instructional supervision, curriculum coordination, and monitoring learner performance. Differences in instructional leadership practices were not statistically significant across age, sex, educational attainment, and length of service. However, instructional leadership practices differed significantly by training exposure, indicating that participation in professional development is associated with stronger leadership practices. These results support the development of targeted leadership capacity-building interventions, with emphasis on strengthening instructional program management.

Keywords: Instructional Leadership; School Heads; Instructional Program Management; School Mission; Learning Climate; Professional Development; Management Enhancement Plan

1. Introduction

Over the past four decades, instructional leadership has remained a core construct for understanding how school leadership contributes to improved teaching quality and learner achievement. The construct is commonly anchored in the Hallinger–Murphy framework, which conceptualizes instructional leadership through three interrelated dimensions: (a) defining the school mission, (b) managing the instructional program, and (c) promoting a positive school learning climate (Hallinger & Murphy, as summarized in ScienceDirect Topics, n.d.).While the model is historically grounded, it remains highly relevant in contemporary scholarship, particularly as instructional leadership is re-examined in the context of equity, teacher professional development, organizational change, and large-scale accountability systems (Cox & Mullen, 2023).

Recent research has strengthened the argument that instructional leadership matters not only as a leadership identity but as a measurable mechanism through which school leaders

influence instructional coherence and outcomes. For example, contemporary empirical and meta-analytic work has examined how instructional leadership relates to learner outcomes through multi-level pathways, including teacher professional learning and instructional practices (Campos et al., 2023; Keller et al., 2021). These findings reinforce the long-standing claim that principals' influence on student outcomes is among the strongest school-level effects, often second only to classroom instruction, and that the quality of instructional leadership is therefore central to system-wide improvement efforts (Cox & Mullen, 2023).

At the same time, the instructional leadership literature has become more nuanced, shifting from "principal-as-supervisor" approaches toward leadership that is distributed, data-informed, and capacity-building, especially under conditions of complex reform and post-pandemic recovery. Studies using large-scale datasets have explored how teachers' perceptions of instructional leadership relate to well-being and workload, suggesting that instructional leadership must be both improvement-oriented and supportive of teachers' professional conditions (ScienceDirect, 2025). This matters because teacher performance and well-being are increasingly viewed as enabling conditions for sustained gains in learner outcomes, particularly in systems facing persistent learning gaps and resource constraints.

In the Philippine context, the importance of instructional leadership has been underscored through formal policy architecture that explicitly defines school head expectations, professional standards, and accountability measures. The Department of Education (DepEd) institutionalized leadership competencies through its national adoption and implementation of the Philippine Professional Standards for School Heads (PPSSH) via DepEd Order No. 024, s. 2020. This policy positions school heads as key drivers of teaching quality and learner achievement by standardizing leadership practice and professional growth pathways across schools (Department of Education [DepEd], 2020). The PPSSH policy context is especially relevant because it aligns principal leadership with instructional improvement mandates, thereby creating an operational environment in which instructional leadership is not merely a theoretical construct but a performance expectation embedded in school governance.

Despite strong policy alignment, implementation realities often reveal that the three dimensions of instructional leadership do not develop evenly. Across multiple settings, managing the instructional program—including supervising instruction, coordinating curriculum, monitoring learner progress, and protecting instructional time—frequently emerges as the most demanding domain because it requires both technical expertise and sustained time investment amid competing administrative responsibilities (ScienceDirect Topics, n.d.; Springer, 2019). This unevenness is significant in decentralized systems, where school heads operate at the intersection of accountability pressures, administrative burdens, and teacher development needs. Consequently, even when principals demonstrate strong leadership in mission-setting and school climate, the deeper instructional core—classroom practice, curriculum alignment, and learning data use—may receive comparatively less consistent attention.

In response to these challenges, the literature increasingly emphasizes the role of principal professional development as a strategic lever for strengthening instructional leadership capacity. A growing body of evidence links professional learning for school leaders with improved instructional leadership behaviors and enhanced support for teacher development (Cox & Mullen, 2023). Research has also highlighted that effective principal professional development is often characterized by coherence, job-embedded learning, structured peer learning networks, and a focus on instructional improvement routines rather than generic administrative training (AASA, 2022). These insights are especially relevant to school systems such as the Philippines, where leadership development is expected to support not only compliance but also continuous improvement and instructional transformation.

Within the broader instructional leadership literature, the relationship between principal leadership and teacher professional development has become a central theme. Empirical work

has found that instructional leadership is a significant predictor of teachers' professional learning and related instructional practices, suggesting that when school heads actively engage in supervision, feedback, and instructional support, teachers are more likely to participate in meaningful professional development and translate learning into improved instruction (SpringerOpen, 2024). Complementary qualitative work further illustrates that teachers experience instructional leadership through coaching behaviors, development planning, and sustained dialogue about teaching and learning, rather than through episodic observation alone (Semantics Scholar, 2023). Together, these findings suggest that instructional leadership is both an organizational driver and a relational practice, shaping the school's professional learning culture.

The contemporary resurgence of interest in instructional leadership also reflects a scholarly recognition that the construct remains foundational, even as leadership contexts evolve. Notably, Hallinger's recent reflection on instructional leadership underscores its continuing relevance, particularly as scholars mark major milestones such as the long-standing use of PIMRS and continued adaptation of the model across education systems and contexts (Hallinger, 2025). This perspective is important because it affirms that instructional leadership remains a vital framework for examining how school leaders can sustain instructional quality while responding to new pressures, including equity priorities, digital transformation, and system shocks.

However, instructional leadership is not enacted in abstraction; local conditions, training exposure, and institutional supports shape it. Evidence from local and regional studies in the Philippines has repeatedly highlighted the importance of leadership competence, structured standards, and continuous professional development—particularly in domains related to teaching and learning (IJAMS, 2024). Although such studies vary in setting and method, they reinforce a consistent conclusion: leadership competencies and professional development matter, and there is value in generating localized evidence to inform targeted improvement interventions. This is especially relevant for municipalities and divisions where school contexts, resourcing patterns, and leadership pipelines may differ from national averages.

In this context, examining instructional leadership practices among public elementary school heads in specific localities is both timely and necessary. Local evidence can clarify which domains of instructional leadership are consistently practiced at high levels and which domains require targeted enhancement. It can also support the development of actionable improvement strategies—such as a management enhancement plan—that aligns with the PPSSH and local capacity development needs (DepEd, 2020). Importantly, such localized approaches can strengthen the "fit" between national leadership expectations and the operational realities of school heads, thereby enabling more feasible and sustainable leadership development.

Finally, the policy and research landscape between 2019 and 2025 indicates that instructional leadership research is expanding beyond simple correlations toward more robust evidence on mechanisms, conditions, and mediators. Large-scale, multi-country, or high-sample studies now examine how instructional leadership shapes teacher outcomes and professional conditions. At the same time, system-level reforms increasingly require school heads to manage compliance and drive instructional coherence (ScienceDirect, 2025). Taken together, these developments justify continued inquiry into instructional leadership practices among school heads, particularly in settings where leadership standards have been formalized and where professional development is expected to translate into measurable improvements in teaching and learning.

Accordingly, the present research is positioned within this literature and policy context, focusing on instructional leadership practices as a basis for targeted improvement planning. By examining how school heads enact mission-setting, instructional program management, and school learning climate development—and by considering the role of professional development—

this study provides local evidence that can inform leadership enhancement efforts aligned with national standards and school improvement priorities.

2. Method

2.1 Research Design

This study employed a quantitative descriptive research design, using a cross-sectional survey, to determine the levels and patterns of instructional leadership practices among public elementary school heads. A descriptive design is appropriate when the primary purpose is to systematically describe existing conditions, establish baseline patterns, and quantify perceptions or self-reported practices without manipulating variables or introducing interventions (Siedlecki, 2020). In IMRAD manuscripts, this design is commonly used when the research aims to generate context-specific evidence that can inform institutional planning and policy-based improvement programs.

The study focused on instructional leadership as operationalized through established domains frequently adopted in educational leadership research: defining the school mission, managing the instructional program, and promoting a positive school learning climate (Hallinger, 2025). This framework provides a theoretically grounded basis for measuring school heads' leadership behaviors aligned with instructional improvement priorities and accountability systems. Within this framework, the study quantified the extent to which respondents practiced leadership behaviors within each domain and examined whether reported instructional leadership practices differed across groups defined by selected profile variables.

A survey method was selected because it enables the efficient collection of standardized responses from the entire population of school heads, thereby allowing the generation of comparable quantitative indicators of leadership practice. Surveys are widely used in leadership research due to their suitability for producing summary measures such as domain means, composite scores, and rankings that support program planning and benchmarking (Ponto, 2019). In this study, the design supported both descriptive and comparative components: (a) describing overall levels of instructional leadership and (b) testing for statistically significant differences in instructional leadership when demographic and professional characteristics grouped respondents.

The descriptive design was complemented by comparative statistical procedures—specifically, tests of difference—to determine whether observed variations in instructional leadership practices across groups were statistically meaningful. This approach is consistent with quantitative descriptive-comparative studies in education, which aim to identify patterns and determinants of professional practice in naturally occurring settings (Siedlecki, 2020). The comparative component of the design is particularly relevant in school leadership contexts, as leadership behaviors may vary based on factors such as years of experience, professional development exposure, and formal training, which are often used as proxies for leadership capacity and role preparedness (Cox & Mullen, 2023).

Overall, this research design is aligned with the practical purpose of producing evidence that can serve as a basis for organizational decision-making—such as the development of a management enhancement plan or structured professional development interventions—while remaining consistent with IMRAD expectations for transparency, replicability, and methodological coherence.

2.2 Participants

The participants of this study were public elementary school heads in the study locale. Consistent with generating complete locality-level evidence, the study used a census approach in which all eligible members of the defined population were included as respondents. A census

design is appropriate when the population is sufficiently small and accessible, and when the intent is to produce findings that are directly representative of the entire target group rather than estimates derived from a subset (Australian Bureau of Statistics [ABS], 2024).

Under this approach, the sampling strategy is characterized as total population sampling, which involves examining the entire population that meets the study's inclusion criteria (Lærd Dissertation, 2024). This is particularly suitable in leadership studies where (a) the target group is limited in size, (b) each unit has specialized role-based experience, and (c) subgroup comparisons are relevant for local planning and professional development prioritization. Including the full population strengthens the study's internal representativeness for the locale and reduces sampling error that may arise when only a portion of the population is surveyed (ABS, 2024).

2.3 Instrumentation

Data were collected using a structured survey questionnaire designed to measure the instructional leadership practices of public elementary school heads. The instrument was developed and organized around widely used instructional leadership domains—defining the school mission, managing the instructional program, and promoting a positive school learning climate—which remain central to contemporary instructional leadership scholarship and measurement (Hallinger, 2025). These domains were operationalized into observable leadership practices appropriate for elementary school leadership contexts, ensuring that the items reflected day-to-day leadership behaviors related to instructional improvement, curriculum implementation, supervision, professional learning, and the learning environment.

The questionnaire consisted of two parts. The first part gathered respondent profile variables relevant for subgroup analyses (e.g., age group, sex, highest educational attainment, years in service, and training exposure). The second part measured instructional leadership practices using domain-based item clusters aligned with instructional leadership constructs. Responses were collected using a Likert-type response format, a standard approach for measuring latent constructs such as leadership practices and perceptions (Lovett et al., 2021). A Likert-type structure supports quantitative aggregation (e.g., item, domain, and composite means) and enables comparisons across domains and respondent groups. In accordance with best practice, the instrument specified clear verbal anchors for each scale point to reduce interpretive ambiguity and improve response consistency (Hoekstra et al., 2025).

To ensure the instrument's appropriateness and alignment with the intended constructs, the questionnaire underwent content validation by subject-matter experts with relevant experience in educational leadership, instructional supervision, and research measurement. Content validation was conducted to evaluate the relevance, clarity, and representativeness of each item relative to the targeted instructional leadership domains. This process is recommended as a foundational step in establishing validity evidence, particularly when a questionnaire is researcher-developed or adapted for a specific context (Yusoff, 2019).

The validation process followed a structured approach consistent with Content Validity Index (CVI) methods, which quantify expert agreement on item relevance and help identify items requiring revision or removal (Yusoff, 2019). Expert feedback was incorporated through iterative refinement, including rewording ambiguous statements, improving alignment with the domain constructs, and ensuring that items were appropriate for the school heads' scope of work and policy environment.

After validation and refinement, the questionnaire underwent reliability testing to assess the internal consistency of the domain scales. Reliability is a core measurement property indicating the degree to which items within a domain measure the same underlying construct consistently (Taber, 2020). Internal consistency reliability was assessed using Cronbach's alpha (α), which remains a commonly reported reliability coefficient in education and social science research when using multi-item Likert-type scales (Taber, 2020). In interpreting Cronbach's alpha,

the study followed standard reporting practice, treating coefficients at or above commonly used thresholds (e.g., α ≈ .70 or higher) as indicative of acceptable internal consistency, while also recognizing that alpha is sensitive to scale length and dimensionality (Boulton et al., 2024). The reliability analysis results informed whether any items required further refinement to improve consistency within each domain.

For descriptive analysis, item responses were aggregated to compute domain-level means and an overall instructional leadership mean. Likert-type data are frequently summarized through means and standard deviations when reported as summated or composite scale scores, particularly in applied educational research and survey-based leadership studies (Hoekstra et al., 2025). Interpretation of the computed means followed an explicit scale descriptor system, which enabled clear reporting of the extent of practice per domain and facilitated ranking of strengths and priority areas for improvement.

Overall, the instrumentation procedures—framework-based construction, expert content validation, and internal consistency reliability testing—were designed to ensure that the questionnaire generated evidence that was sufficiently valid and reliable for describing instructional leadership practices and supporting comparative analyses aligned with the study objectives.

2.4 Data Analysis

Data were analyzed using descriptive and inferential statistical procedures aligned with the study's objectives of (a) determining the level of instructional leadership practices and (b) identifying whether these practices differed when respondents were grouped according to selected profile variables. Prior to analysis, completed questionnaires were reviewed for completeness and consistency, and responses were entered into a statistical worksheet for computation. The analysis followed a descriptive-comparative approach, a common strategy in survey-based educational leadership research, in which results are summarized quantitatively and subsequently examined for group differences under naturally occurring conditions (Hoekstra et al., 2025).

For the descriptive component, respondent profile variables were summarized using frequency counts and percentages to provide an overview of the participant characteristics. Instructional leadership practices were quantified through weighted means computed per item and aggregated at the domain level (defining the school mission, managing the instructional program, and promoting a positive school learning climate), as well as through an overall composite mean. Likert-type scale responses were treated as summated scale scores and summarized using means to support interpretive comparisons across domains, consistent with established guidance on analyzing Likert-type data in applied research (Hoekstra et al., 2025). Domain means were subsequently ranked to determine relative areas of strength and priority, enabling the identification of domains that may require targeted enhancement. This practice is consistent with descriptive interpretation approaches for Likert-scale composites, in which the comparative ranking of domain indicators is used to support planning and prioritization decisions (Alkharusi, 2022).

For the inferential component, the study tested whether instructional leadership practices differed significantly across respondent groups. Where the grouping variable contained two categories, an independent-samples t-test was used to compare mean instructional leadership scores between groups, this test is appropriate for evaluating whether the difference between two independent group means is statistically significant, provided that relevant assumptions (e.g., independence of observations, approximate normality of the outcome distribution, and homogeneity of variances) are reasonably satisfied (LibreTexts, 2024). Statistical significance was evaluated at an alpha level of 0.05, and results were interpreted based on the computed t statistic, degrees of freedom, and p-value. For reporting and manuscript consistency, inferential

results were expressed in narrative form following common APA statistical reporting conventions (e.g., *t*(df) = value, *p* = value), while maintaining the concise reporting style typical of Elsevier-methods sections (Social Science Statistics, n.d.).

Collectively, these analytical procedures supported the study's aim of producing locality-level evidence on instructional leadership practices, identifying the strongest and least emphasized instructional leadership domains, and determining whether professional and demographic factors were associated with variations in leadership practice. The results of these analyses served as the empirical basis for drawing conclusions and proposing actionable leadership enhancement strategies consistent with the study's objectives.

3 Results

The results indicate that the public elementary school heads demonstrated a high to very high level of instructional leadership practice across the major domains assessed. When instructional leadership was examined as an overall construct, the composite mean reflected consistently strong leadership behaviors aligned with the core functions of school heads as instructional leaders. Across the three instructional leadership domains, respondents generally reported frequent engagement in practices associated with setting direction, supporting instruction, and fostering a productive learning environment—suggesting that instructional leadership is embedded in routine school management and instructional improvement efforts within the locale.

When domain-level performance was compared, the results showed that defining the school mission emerged as one of the strongest areas of practice. School heads reported consistent implementation of leadership behaviors related to goal setting, communicating school priorities, and aligning stakeholders toward shared instructional outcomes. This suggests that respondents were effective in articulating a clear instructional direction and in maintaining alignment between school programs and institutional goals. The prominence of this domain reflects school leaders' tendency to emphasize direction-setting practices closely linked to planning cycles, accountability expectations, and school improvement frameworks.

Similarly, the domain of promoting a positive school learning climate was rated at a high to very high level, reflecting strong leadership practice in establishing supportive conditions for teaching and learning. Results suggest that school heads actively fostered professional collaboration, encouraged teacher development, and maintained an environment conducive to student learning and teacher performance. This domain also implies that school heads invested effort in sustaining school culture, reinforcing standards, and implementing supportive strategies that facilitate instructional focus and organizational stability.

In contrast, managing the instructional program was comparatively lower than the other domains, although it remained at a high level of practice overall. This pattern indicates that while school heads generally engage in instructional supervision and curriculum-related leadership functions, this domain represents a relative area for strengthening compared with mission-setting and learning climate practices. Managing the instructional program involves more technical and time-intensive leadership tasks, such as monitoring curriculum implementation, conducting classroom observations, providing instructional feedback, and using learner performance data for instructional decision-making. The comparatively lower rating suggests that these practices may be affected by operational constraints, competing administrative responsibilities, or variations in technical support and capacity—thereby identifying this domain as a priority area for enhancement planning.

Results further showed that differences in instructional leadership practices were not statistically significant when respondents were grouped by selected demographic and professional variables such as age group, sex, educational attainment, and length of service. This suggests that instructional leadership behaviors were relatively consistent across these group

classifications, and that leadership practice in the locale may be influenced more by shared professional expectations and standardized school head roles than by demographic variation. The consistency of results across these variables also implies that school head responsibilities and leadership performance expectations may be sufficiently uniform to produce comparable leadership practice patterns across the population.

However, the findings revealed a statistically significant difference in instructional leadership practices across training exposure groups, indicating that professional development participation was associated with variation in leadership practices. School heads with greater training exposure demonstrated stronger instructional leadership behaviors than those with less training. This result supports the interpretation that training improves leadership capacity, particularly in domains that require technical instructional supervision skills, data use, and curriculum coordination. The observed significance of training as a differentiating factor provides a clear empirical justification for strengthening leadership development initiatives and designing targeted interventions—particularly those that address the relatively lower domain of instructional program management.

Overall, the results provide evidence that school heads in the locale generally perform instructional leadership functions at a high level, with the strongest practices observed in mission-setting and learning climate development, and with instructional program management identified as a relative area for enhancement. Moreover, the significance of training exposure underscores the role of structured professional development in strengthening leadership practice, reinforcing the need for sustained, targeted capacity-building programs as part of an evidence-based management enhancement plan.

4. Discussion

The present study examined the instructional leadership practices of public elementary school heads and generated three principal findings: (a) respondents demonstrated generally high to very high instructional leadership practicesacross domains, (b) defining the school mission and promoting a positive school learning climate emerged as the strongest domains, while managing the instructional program was comparatively lower, and (c) instructional leadership practices did not differ significantly across most profile variables but did differ significantly by training exposure. Taken together, these findings reinforce the continuing relevance of instructional leadership as a core leadership expectation in contemporary basic education systems and highlight professional development as a practical lever for strengthening leadership behaviors (Hallinger, 2025; Cox & Mullen, 2023).

The overall high instructional leadership ratings may be interpreted through the lens of policy alignment and professional standardization. In the Philippine setting, the institutionalization of leadership standards—particularly through the national adoption of the Philippine Professional Standards for School Heads (PPSSH)—creates strong normative expectations that school leaders will demonstrate consistent leadership practices aligned with instructional improvement, teacher development, and learning outcomes (Department of Education [DepEd], 2020). The high ratings observed in the current study may therefore reflect a context in which instructional leadership is not optional but is embedded in formal evaluation, school planning routines, and accountability frameworks. This interpretation is consistent with scholarship suggesting that clear professional standards and coherent role expectations can strengthen the consistency of leadership behavior across schools (Cox & Mullen, 2023).

The prominence of defining the school mission suggests that school heads are particularly effective in direction-setting activities such as establishing goals, communicating school priorities, and aligning school programs with agreed instructional outcomes. This pattern aligns with instructional leadership frameworks that position mission-setting as a foundational leadership function, as it establishes coherence among instructional priorities and provides clarity for staff

decision-making (ScienceDirect Topics, n.d.). Mission-setting also closely aligns with required school governance processes (e.g., school improvement planning and goal monitoring), which may explain why this domain is rated highly. These activities are structured, recurring, and highly visible within school management systems. In operational terms, this implies that school heads can effectively mobilize stakeholders around learning priorities, which is a critical enabling condition for sustained improvement.

Similarly, the high ratings in promoting a positive school learning climate indicate strong leadership behaviors in cultivating supportive professional and learning conditions, including teacher collaboration, encouragement of professional development, and the maintenance of a school environment conducive to learning. Contemporary research increasingly emphasizes that instructional leadership is not only about technical supervision but also about shaping organizational conditions under which teachers can sustain effective practice. Large-scale analyses have shown that instructional leadership can be associated with teacher conditions and well-being, suggesting that effective instructional leaders must balance performance expectations with supportive structures that protect professional functioning (ScienceDirect, 2025). This finding is therefore consequential: it implies that the school heads' leadership is not solely compliance-driven but includes relational and climate-building practices that are increasingly recognized as central to instructional improvement.

In contrast, managing the instructional program—while still rated high—was comparatively weaker than mission-setting and learning climate. This finding is consistent with broader instructional leadership literature which notes that instructional program management is often the most complex and resource-intensive domain because it requires sustained engagement in classroom supervision, curriculum coordination, assessment monitoring, and the use of learning data for instructional decision-making (ScienceDirect Topics, n.d.; Springer, 2019). Managing the instructional program is often constrained by administrative workload, time scarcity, and competing operational demands on school heads. In many settings, school leaders must allocate substantial time to compliance, logistics, and resource management, thereby reducing the time available for deep instructional work. Therefore, the relatively lower rating in this domain likely signals not a lack of intent but the practical challenges of consistently executing technical instructional leadership routines.

The non-significant differences in instructional leadership across variables such as sex, age, educational attainment, and years of service suggest that leadership practice in this locale is relatively consistent across demographic groups. One interpretation is that standardized leadership expectations and shared professional accountability structures may reduce variance in leadership practice across individual characteristics, particularly when school heads operate under common performance standards and system expectations (DepEd, 2020). Another interpretation is that leadership practice may be shaped more strongly by organizational conditions and professional learning opportunities than by demographic factors alone, especially when leadership roles are clearly defined and supported through institutional guidance.

The most actionable finding of the study is the significant difference in instructional leadership by training exposure, indicating that school heads with greater professional development participation demonstrate stronger instructional leadership practices. This aligns with evidence that principal professional development supports leaders' capacity to respond to evolving instructional expectations and strengthens leadership effectiveness—particularly in domains requiring coaching, feedback, instructional monitoring, and data-informed supervision (Cox & Mullen, 2023). The training effect is also consistent with the argument that leadership competence is not simply a function of tenure but is strengthened through structured learning experiences that develop specialized instructional leadership skills. Importantly, the significance of training provides a clear evidence base for designing and prioritizing targeted leadership development interventions as part of a management enhancement plan.

The combined pattern of results provides an empirically grounded basis for targeted enhancement planning. Because mission-setting and learning climate are already strong, interventions may be most impactful if they prioritize strengthening instructional program management, particularly in high-leverage routines such as classroom observation with feedback, curriculum alignment monitoring, learner performance tracking, and teacher coaching cycles. Moreover, since training exposure differentiates instructional leadership practice, leadership development strategies should be systematic, job-embedded, and aligned with instructional leadership priorities rather than generalized administrative training. This is consistent with recommendations in leadership development literature that emphasize coherent professional learning models—peer learning, instructional coaching for leaders, and structured supervision protocols—as more likely to shift practice than one-time seminars (Cox & Mullen, 2023; AASA, 2022).

In summary, the study contributes evidence that instructional leadership practices among school heads are generally strong, but that instructional program management remains the most strategic domain for improvement, and that training exposure is a key differentiator of leadership practice. These findings support the development of a management enhancement plan anchored in strengthening instructional supervision and curriculum monitoring routines, and in expanding structured leadership capacity-building opportunities. The results also reinforce the continuing relevance of instructional leadership frameworks in the contemporary era and demonstrate how local evidence can be translated into actionable improvement strategies consistent with national professional standards (Hallinger, 2025; DepEd, 2020).

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INTEGRATION OF SOCIAL MEDIA PLATFORMS AS SUPPLEMENTARY TOOLS IN TEACHING MAPEH IN SENIOR HIGH SCHOOL

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Abstract

This descriptive-comparative study examined the utilization of social media platforms as supplementary tools in teaching MAPEH among Senior High School teachers and students. It determined the frequency of use of Facebook Groups, YouTube, TikTok, and TeacherPH; evaluated perceived effectiveness for instruction and learner engagement; compared perceptions of teachers and students; and analyzed differences in academic performance between learners exposed and not exposed to social media–supported lessons. Guided by constructivism, blended learning, and the Technology Acceptance Model, the study used researcher-made questionnaires and achievement records. Weighted means, percentages, and independent-samples t-tests were employed at the 0.05 level of significance. Results showed that Facebook Groups and YouTube were the most frequently used platforms for posting learning materials, demonstrations, and guidance on performance tasks.

In contrast, TikTok was used moderately for short skill videos and motivation. TeacherPH was least used due to its limited student interactivity and more text-based resources. Both groups rated social media as highly effective in supporting participation, collaboration, and interest in MAPEH activities; however, students reported significantly higher effectiveness ratings than teachers. Academic performance of exposed students was slightly higher than that of non-exposed peers, with clearer gains on performance tasks than on written assessments. Findings suggest that social media can enhance MAPEH learning when integrated with clear objectives, safe-use policies, and teacher facilitation. Based on the results, a contextualized program for structured social media integration in MAPEH is proposed to maximize engagement while minimizing distraction and access inequities. Regular monitoring and digital citizenship training are recommended for sustained classroom use.

Keywords: Social Media, MAPEH, Senior High School, Learner Engagement, Supplementary Instruction, Academic Performance, Blended Learning

1. Introduction

The rapid expansion of social media use among adolescents has reshaped how students access information, form communities, and express creativity. In education, these platforms are no longer only personal communication tools; they have become informal learning spaces where learners watch demonstrations, exchange feedback, and co-construct knowledge with peers and teachers. Recent syntheses show that social media is increasingly adopted across disciplines to support collaboration, resource sharing, and learner engagement, especially when formal classroom time is limited or when students are already active on these platforms outside school (EBSCO Research Starters, n.d.; Saura et al., 2023). Because social media environments are familiar and interactive, they can reduce the psychological distance between school learning and daily life, creating opportunities for authentic participation and sustained interest (Advance HE, 2024).

In Senior High School (SHS), the subject MAPEH (Music, Arts, Physical Education, and Health) presents a particularly strong case for integrating social media. MAPEH learning is

performance-centered: students must observe skills and techniques, practice repeatedly, and present outputs such as movement routines, musical performances, artwork, or health advocacy products. These outcomes align with constructivist assumptions that learners build understanding through active experience, social interaction, and reflection on practice (Kennedy Center, n.d.). Social media platforms provide ready spaces for such experiences—for example, video-based demonstrations of PE skills, creative showcases of the arts, or peer discussion threads on health issues—supporting learning that extends beyond classroom walls.

At the same time, the post-pandemic shift toward blended and technology-supported teaching has accelerated expectations for teachers to use digital tools. Blended learning research in performance-based fields such as physical education indicates that combining face-to-face instruction with online resources can improve skill development, satisfaction, and learning continuity when appropriately designed (Wang, 2022; Zhang & Wang, 2025). Social media can serve as a practical, low-cost component of blended learning because it enables flexible access, rapid content distribution, and peer-to-peer interaction, even where dedicated learning management systems are less widely available. For many SHS contexts, especially in public schools, platforms like Facebook Groups, YouTube, and TikTok are already accessible via low-bandwidth mobile devices, making them realistic supplementary tools.

However, adopting social media for instruction depends not only on availability but also on how teachers and students perceive its value. The Technology Acceptance Model (TAM) explains technology adoption through perceived usefulness and perceived ease of use, which shape attitudes and behavioral intention to use a tool (Granić & Marangunić, 2019). Studies applying TAM in education consistently show that teachers' willingness to integrate digital or social media tools is influenced by whether they believe the tools genuinely support learning goals and whether using them feels manageable within their workload and skills (Ibrahim & Shiring, 2022; Wohlfart & Wagner, 2024). Importantly, students often view social media as a natural extension of their learning habits. At the same time, teachers may be more cautious due to concerns about distraction, privacy, and alignment with curricular standards. These contrasting perspectives can affect how consistently platforms are integrated and how effective they become in practice.

In the Philippine setting, the integration of online platforms must also be viewed alongside digital citizenship and safe-use expectations. National and regional policy discussions emphasize that technology-supported learning should be paired with responsible online behavior, privacy awareness, and guidance on ethical participation (SEAMEO INNOTECH, 2023). This is relevant to MAPEH classrooms, where students may upload performance videos, comment on peers' work, or engage in health-related discussions that require respectful, safe interaction. The educational value of social media, therefore, depends on structured facilitation, clear norms, and equitable access.

Despite growing international evidence on social media in education, empirical studies focusing on MAPEH-related learning at the SHS level remain limited, particularly those that compare teacher and student perceptions and examine performance outcomes under social media-supported instruction. Much of the existing literature centers on general academic subjects or higher education contexts, leaving a gap in understanding how supplementary social media use supports skill-based, creative, and health-oriented learning in basic education (Saura et al., 2023). There is also a need to identify which platforms are most commonly used in actual classroom practice and why certain tools are favored over others. Local evidence is essential so schools can design contextualized programs that maximize engagement while minimizing risks, such as off-task behavior or unequal participation due to connectivity gaps.

Anchored on constructivism, blended learning theory, and TAM, the present descriptive-comparative study investigates the utilization of social media platforms as supplementary tools in teaching MAPEH among Senior High School teachers and students. Specifically, it (1) determines

the frequency of use of Facebook Groups, YouTube, TikTok, and TeacherPH in MAPEH instruction; (2) assesses the perceived effectiveness of these platforms in promoting learner engagement and supporting classroom objectives; (3) compares teacher and student perceptions regarding social media effectiveness; and (4) examines differences in academic performance between students exposed and not exposed to social media-supported MAPEH lessons. By generating platform-specific and stakeholder-specific findings, this study aims to inform practical guidelines and a school-based program for structured social media integration in MAPEH.

The outcomes of this investigation are expected to benefit teachers by clarifying instructional affordances of different platforms and highlighting conditions that support effective use. For students, the study may validate learning practices that align with their digital habits while encouraging safer and more purposeful online participation. For school leaders and curriculum planners, the findings offer evidence for policy-aligned blended learning strategies in performance-based subjects, contributing to more engaging, resilient, and context-responsive MAPEH instruction.

2. Method

2.1 Research Design

The study employed a descriptive-comparative research design to determine both the extent of social media utilization and the differences in perceptions and performance associated with its use in teaching MAPEH among Senior High School teachers and students. The descriptive component focused on identifying the frequency of use of specific platforms (Facebook Groups, YouTube, TikTok, and TeacherPH) and assessing their perceived effectiveness for instruction and learner engagement through weighted means, frequencies, and percentages. The comparative component examined whether significant differences existed between teachers' and students' perceptions and whether academic performance varied between learners exposed and not exposed to social media-supported MAPEH instruction, using independent-samples t-tests at the 0.05 level of significance. This design was appropriate because it allowed the researcher to describe current practices as they naturally occur while also statistically comparing groups without manipulating variables, thereby generating evidence on how social media functions as a supplementary teaching tool in real classroom contexts.

2.2 Participants

The study participants consisted of selected Senior High School MAPEH teachers and SHS students from participating schools, representing the two key stakeholder groups directly involved in social media–supported instruction. Teachers served as respondents to describe and evaluate platform use in instruction, while students provided parallel perceptions of effectiveness and engagement based on their learning experiences. To address the comparative objectives, the student participants were further grouped into those exposed to MAPEH lessons supplemented with social media platforms and those not exposed, allowing academic performance to be examined across naturally occurring instructional conditions. Participants were chosen from intact school contexts to reflect real classroom practice rather than experimentally manipulated settings, ensuring that perceptions and performance data captured authentic patterns of social media integration in MAPEH.

2.3 Instrumentation

The study used a researcher-developed questionnaire and academic achievement records as its primary data collection instruments. The questionnaire was structured into parallel teacher and student forms. It consisted of sections that measured (a) the frequency of social media use in MAPEH across Facebook Groups, YouTube, TikTok, and TeacherPH, and (b) the

perceived effectiveness of these platforms in supporting instruction, motivation, participation, and learner engagement, using a Likert-type rating scale to allow computation of weighted means. Items were aligned with the study's statements of the problem and anchored on constructivism, blended learning, and the Technology Acceptance Model to ensure content relevance to performance-based MAPEH learning. To address the performance-comparison objective, students' quarterly grades and performance task records in MAPEH were gathered from school academic files and used to compare exposed and non-exposed groups. Together, these instruments enabled the study to describe actual platform utilization, quantify stakeholder perceptions, and relate social media-supported instruction to measurable learning outcomes within authentic classroom contexts.

2.4 Data Analysis

The data were analyzed using both descriptive and inferential statistics aligned with the study's descriptive-comparative design. For the frequency of social media use across platforms, responses were tallied and presented as frequencies, percentages, and rankings to show which tools were most used in MAPEH instruction. Perceived effectiveness and engagement indicators were summarized using weighted means and interpreted through the study's verbal descriptors. To address the comparative objectives, independent-samples t-tests were applied at the 0.05 level of significance to determine whether (a) teachers and students differed significantly in their perceptions of social media effectiveness and (b) students exposed to social media–supplemented lessons differed in academic performance from those not exposed. These procedures enabled the researcher to describe real classroom patterns of platform use while also statistically testing group differences without manipulating instructional conditions, ensuring that conclusions were grounded in both observed trends and verified comparisons.

The study used a researcher-developed, validated questionnaire as the primary instrument, with parallel forms for teachers and students to capture comparable perceptions. The tool consisted of sections measuring: (1) frequency of use of Facebook Groups, YouTube, TikTok, and TeacherPH in MAPEH; (2) perceived effectiveness of social media for delivering lessons and supporting performance tasks; and (3) perceived impact on learner engagement, interaction, and motivation. Items were rated on a Likert-type scale and underwent content validation by experts and pilot testing to ensure clarity and reliability. To measure learning outcomes, students' academic performance records in MAPEH—covering written work and performance tasks—were collected and used to compare exposed and non-exposed groups, providing an objective basis for linking social media supplementation with achievement.

3 Results

The results showed that social media platforms were used to varying degrees as supplementary tools in teaching MAPEH, with clear preferences for video and community-based applications. Among the platforms examined, Facebook Groups and YouTube were the most frequently used. Teachers primarily used Facebook Groups to distribute learning materials, announcements, links, and task instructions, while YouTube served as a repository for skill demonstrations, performance exemplars, and guided practice videos. TikTok was used moderately, usually for short, engaging demonstrations and motivational clips suited to quick PE and dance routines. In contrast, TeacherPH registered the least frequent use because its resources were more teacher-oriented and text-based, with limited direct interactivity for students, making it less compatible with performance-heavy MAPEH activities.

In terms of perceived effectiveness, both teachers and students rated social media as highly effective in supporting instruction and learner engagement. Respondents emphasized that platforms enabled flexible access to demonstrations, allowed repeated viewing for skill mastery, and gave students more opportunities to participate beyond classroom time. Social media was

also viewed as useful for collaborative learning, since learners could share outputs, comment on peers' work, and receive immediate feedback. These results align with the constructivist view that learners build competence through active practice and social interaction, and they highlight how digital spaces can extend performance-based learning beyond face-to-face sessions.

When teacher and student perceptions were compared, a significant difference emerged: students consistently rated social media's instructional effectiveness higher than teachers did. This suggests that students may experience stronger motivational and practical benefits from these platforms because they are already embedded in their daily routines and preferred modes of communication. Teachers, while still positive overall, reflected more cautious ratings, likely influenced by concerns about distractions, uneven access, and the need to manage online spaces. The disparity underscores a TAM-consistent pattern in which acceptance levels differ by stakeholder role and familiarity with the tool.

Academic performance comparisons further indicated that exposure to social media-supplemented MAPEH lessons was associated with slightly higher achievement. The improvement was more evident in performance tasks than in written assessments, suggesting that social media's most substantial contribution lies in skill modeling, rehearsal, and creative production. Because students could rewatch demonstrations, practice at their own pace, and benchmark their outputs against shared exemplars, they were better positioned to refine performance outputs. Meanwhile, written assessment gains were smaller, reflecting that these outcomes still depend heavily on classroom explanations and cognitive testing rather than purely on online practice.

Overall, the results demonstrate that social media functions as a meaningful supplementary environment for SHS MAPEH, especially when aligned with performance-based outcomes. Platform preferences were largely driven by instructional fit—tools that support video, demonstrations, and group interaction were favored. Positive effectiveness ratings and modest performance gains suggest strong instructional potential, but the perceptual gap between teachers and students indicates the need for structured integration, clear guidelines, and support systems. These findings provided the basis for proposing a contextualized program that strengthens purposeful social media use in MAPEH while addressing teacher concerns, student safety, and equity in access.

4. Discussion

The findings of this study corroborate a growing body of literature showing that social media supports performance-based and engagement-centered learning, particularly in physical education–related contexts. Consistent with the present results where Facebook Groups and YouTube were most frequently used and rated highly effective, recent reviews of technology-enhanced pedagogy in physical education report that video and community platforms are preferred because they provide modeling of skills, repeated practice opportunities, and peer interaction—factors that improve engagement and motor-skill learning when aligned with lesson objectives (Technology-Enhanced Pedagogy in Physical Education, 2024). Likewise, blended learning syntheses in physical education emphasize that digital supplements most often yield positive outcomes in motivation, satisfaction, and learning continuity, mirroring the high effectiveness ratings of both teachers and students in this study (Zhang & Wang, 2023).

This study's evidence that social media is beneficial for demonstrations and performance tasks aligns with prior research highlighting the instructional strength of short-form and long-form video tools for physical activity learning. For instance, investigations on TikTok and YouTube use in PE contexts conclude that learners value these platforms because they visualize movement, promote practice outside class, and sustain interest through highly accessible tutorials (Garcia, 2024; Martínez et al., 2025). These patterns closely reflect the current study's observation that

TikTok was used moderately but strategically for quick demonstrations and motivation, while YouTube remained central for more detailed skill instruction.

The significant difference between teachers' and students' perceptions also aligns with acceptance-based studies, which show that students typically evaluate social media more positively than instructors. TAM-grounded research on instructor adoption indicates that, while teachers recognize its usefulness, their acceptance is moderated by concerns about classroom management, privacy, and workload, leading to relatively more cautious ratings than learners (Dennen et al., 2022). Similarly, TAM applications in social media learning environments demonstrate that students' strong perceived ease of use and peer-interaction benefits predict higher engagement and favorable attitudes, reinforcing why students in the present study rated effectiveness more strongly (Buabeng-Andoh, 2018).

In terms of academic performance, this study's modest gains for exposed students—more visible in performance tasks than written work—are consistent with blended learning evidence in PE. Prior experimental and review studies report that digital supplementation tends to produce stronger effects on applied, skill-based outcomes (e.g., routines, motor performance, creative outputs) than on purely cognitive test scores, because platforms mainly enhance practice, feedback, and self-paced mastery (Zhang & Wang, 2023; Wang, 2024). The current findings, therefore, extend these conclusions to the SHS MAPEH context, affirming that social media's greatest instructional contribution lies in performance rehearsal and output refinement rather than in replacing classroom-based conceptual teaching.

Finally, the low utilization of TeacherPH in this study parallels other works, noting that platform fit matters: tools lacking learner-facing interaction or strong multimedia affordances are less likely to be adopted for PE- or arts-related outcomes. Research on students' social media engagement in Philippine schools shows that platforms emphasizing short, interactive, and peer-visible content (such as TikTok) draw higher sustained participation, while text-heavy or teacher-only resources receive weaker uptake (Alarcon, 2025; Salasac et al., 2022). This corroboration supports the study's recommendation for a structured, platform-sensitive integration program that maximizes engagement while managing risks of distraction and inequitable access.

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EFFECTIVENESS OF ACTIVITY-BASED LEARNING STATIONS IN DEVELOPING LEARNERS' SKILLS IN AGRICULTURE AND FISHERY ARTS

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Abstract

This study examined the effectiveness of Activity-Based Learning Stations in improving Grade 7 learners' skills in Agriculture and Fishery Arts (AFA) at Ballay National High School. A quasi-experimental one-group pretest–posttest design was employed involving 40 Grade 7 learners who participated in station-based learning activities designed to strengthen competency in crop production and fishery-related tasks. Learners' skill levels were measured using a performance-based assessment administered before and after the intervention, while a learner challenge checklist was used to document difficulties encountered during implementation.

Results showed a marked improvement in learners' overall skill performance following the intervention. The pretest yielded an overall mean score of 2.54, interpreted as Low Skill, while the posttest yielded a mean score of 3.79, interpreted as High Skill. A paired-samples t-test confirmed that the difference between pretest and posttest performance was statistically significant, $t(39) = 14.37$, $p \approx 0.001$, indicating that Activity-Based Learning Stations contributed to meaningful gains in AFA skills. Learners reported several implementation challenges, with the most common concerns being insufficient time per station, difficulty using tools and equipment, and confusion with task instructions.

Overall, the findings suggest that Activity-Based Learning Stations are an effective instructional approach for improving learners' competency in performance-based AFA tasks. However, results also highlight the importance of careful station planning, adequate time allotment, and clear task guidance to maximize learner engagement and performance. The study provides practical evidence supporting the integration of structured station-based learning strategies into AFA instruction and similar skills-based learning areas.

Keywords: Activity-Based Learning Stations; Station-Based Instruction; Agriculture And Fishery Arts; AFA Skills; Grade 7 Learners; Quasi-Experimental Design; Active Learning

1. Introduction

Agriculture and Fishery Arts (AFA) remains one of the most practical and socially relevant learning areas in the Philippine basic education curriculum. As part of the Edukasyong Pantahanan at Pangkabuhayan (EPP) / Technology and Livelihood Education (TLE) learning area, AFA is designed to help learners acquire foundational competencies that connect classroom learning with real-life applications. The Department of Education (DepEd) emphasizes that EPP/TLE exposes learners to essential life skills, including competencies in agriculture and fisheries, in preparation for productive living and possible livelihood pathways (Department of Education [DepEd], 2023). This emphasis is especially important in a country where agriculture and fisheries remain key sectors for food security, local enterprise, and employment. Introducing learners early to basic production tasks, safety procedures, and responsible resource use strengthens not only technical competence but also practical readiness and awareness of community realities.

AFA is not simply a "skills subject," but a structured learning space where learners begin to understand how food and livelihood systems work. At the junior high school level, learners are expected to practice basic tasks that develop psychomotor competence, technical reasoning, and

work habits—competencies that cannot be effectively built through lecture-only strategies. The MATATAG Curriculum reinforces that EPP/TLE aims to develop learners who can apply skills in authentic contexts; agriculture and fishery arts are positioned within the curriculum's commitment to applied learning and practical competencies (DepEd, 2023). In addition, DepEd has established programs that connect agricultural education with school and community development, such as farm schools, where learners are exposed to sustainable farming, skills development, and agricultural livelihood preparation (DepEd, 2021). These initiatives reflect a national recognition that agriculture-related learning has both educational and developmental significance.

Despite the clear curriculum direction, many schools still struggle to deliver AFA in ways that fully achieve its hands-on competency goals. One persistent issue is that AFA instruction often shifts toward theory-heavy delivery due to limitations in tools, materials, facilities, and time for practice. This challenge is especially pronounced in public secondary schools, where large class sizes and resource constraints can reduce the frequency and depth of practical activities. Even when teachers demonstrate skills, learners may remain observers rather than active participants. Under these conditions, learners may understand concepts cognitively but still struggle with technical execution—such as proper tool handling, following correct steps, accuracy in performance, or efficiency in completing tasks. In applied subjects like AFA, these skill gaps matter because competence is demonstrated through performance rather than recall.

Competency-based education principles support this concern. In technical and vocational learning, competence is defined by performance standards—learners must demonstrate specific skill outcomes rather than merely describe them. In the Philippine context, the Technical Education and Skills Development Authority (TESDA) consistently positions competency standards as central to technical education and training, supporting the broader direction of competency-based instruction in skill-oriented learning environments (Technical Education and Skills Development Authority [TESDA], n.d.). Although TESDA focuses on post-basic and workforce-oriented training, the principle of competency demonstration is relevant to junior high school AFA because AFA is part of the foundational pipeline of technical-livelihood learning. Learners who do not gain adequate hands-on practice early may enter higher levels of TVL learning with weak skill readiness and low confidence.

Within this context, activity-based teaching approaches are increasingly recognized as necessary for strengthening performance in practical subjects. Active learning and student-centered instructional models emphasize that learners gain a deeper understanding and mastery when they are directly engaged in meaningful tasks, rather than receiving information passively. Research literature consistently indicates that active methodologies improve learning outcomes by increasing participation, motivation, and time-on-task—elements critical to competency development in practical disciplines (Ribeiro-Silva et al., 2022). The core idea is that learners develop skills most effectively when they are given repeated opportunities to perform tasks, receive feedback, and reflect on their performance.

One structured way to apply active learning in practical subjects is through Activity-Based Learning Stations, also referred to as learning stations or station rotation models. Learning stations divide a classroom, laboratory, or learning environment into multiple task areas, where learners rotate in small groups. Each station is designed to build a specific competency through guided practice and task completion. Unlike whole-class demonstrations, learning stations increase the time learners spend actually practicing the target skill. Station rotation models have been widely used in blended learning and differentiated instruction contexts, particularly because they allow teachers to manage small-group instruction. At the same time, other learners engage in independent or collaborative tasks (American Institutes for Research [AIR], 2021). In practical subjects such as AFA, this approach offers a promising structure for maximizing limited resources. Instead of having all learners wait for a single demonstration or share a few tools at once, stations allow smaller groups to practice while the teacher circulates to coach and monitor progress.

Learning stations also align with the fundamental logic of skill acquisition: learners need repeated, structured practice. When tasks are broken down into stations, learners can focus on one competency at a time—such as soil preparation, planting procedures, basic fishery operations, or tool care—and gradually improve through repetition. Over time, the combination of repetition, feedback, and scaffolding contributes to stronger psychomotor development and more consistent performance. Teacher support at learning stations is also more targeted: rather than supervising a whole class performing a single task, the teacher can intervene at critical points, correct errors early, and reinforce safety and sanitation routines.

Educational research provides evidence of the effectiveness of learning stations in improving achievement and skill performance. A meta-analysis on the learning stations technique found that it has a positive effect on academic achievement when compared with traditional approaches, suggesting that structured stations support stronger learning outcomes by promoting engagement and practice opportunities (Şahin, 2019). Additionally, practitioner and research-based guidance on station rotation emphasizes that the approach increases time-on-task, supports differentiation, and strengthens mastery when station tasks are clearly designed and aligned to learning goals (AIR, 2021). These features correspond well with the needs of AFA instruction, where competency mastery depends on repeated task execution and guided performance.

However, implementing learning stations also requires attention to known challenges. Station rotation models can become less effective when learners have too little time per station, unclear task directions, insufficient tools, or uneven group participation. Practitioner literature highlights that pacing and station management are common barriers, particularly in classrooms with limited resources (AIR, 2021). In AFA contexts, such barriers may be intensified because tasks often require physical equipment and procedural accuracy, and learners may experience low confidence in tool handling and task performance. These realities indicate that while learning stations are promising, their effectiveness must be evaluated in real school settings, especially in public secondary schools, where constraints are common.

The present study, therefore, responds to both a practical instructional need and a research gap. While AFA is expected to develop real-life competencies, many learners remain underprepared in technical execution due to limited hands-on opportunities. A structured intervention, such as Activity-Based Learning Stations, may offer a feasible and effective solution, but its impact must be demonstrated with evidence. At Ballay National High School, where AFA is implemented as part of the Grade 7 curriculum, there is a clear need to strengthen learners' skills through strategies that increase engagement, increase practice time, and focus on competency. This study investigates whether Activity-Based Learning Stations can significantly improve learners' AFA performance—particularly in key areas such as crop production routines, tool use, safety practices, accuracy, efficiency, and basic fishery operations.

By examining learners' pretest and posttest performance and documenting challenges encountered during station activities, the study aims to provide localized evidence that can inform instructional improvement. More importantly, the findings can contribute to broader discussions on how applied, competency-driven strategies can strengthen technical-livelihood education at the junior high school level. Ultimately, improving AFA instruction is not only about raising test scores but also about equipping learners with meaningful skills that support life readiness, community development, and future livelihood possibilities within and beyond the school environment.

2. Method

2.1 Research Design

This study utilized a quasi-experimental research design, specifically the one-group pretest–posttest design, to determine the effectiveness of Activity-Based Learning Stations in improving Grade 7 learners' skills in Agriculture and Fishery Arts (AFA). The design was selected because it allowed the researcher to examine changes in learners' performance before and after the intervention under natural classroom conditions, where random assignment of participants to experimental and control groups was not feasible.

In this design, the same group of learners was assessed at two points: (1) prior to the implementation of the Activity-Based Learning Stations (pretest) and (2) after completing the station-based learning activities (posttest). The difference between the two assessment results served as the main basis for evaluating whether the intervention produced measurable improvements in learners' AFA skills. This design is commonly applied in educational research when the primary goal is to test the impact of a teaching strategy within an existing class or school setting, particularly when ethical and logistical constraints prevent the use of randomized controlled trials.

The quasi-experimental approach was especially appropriate for the present study because AFA is a performance-based subject that requires the development of practical competencies through practice and structured activities. Activity-Based Learning Stations were introduced as a planned instructional intervention intended to increase learners' engagement, hands-on participation, and skill mastery by allowing learners to rotate through specific learning tasks and apply competencies in small-group settings. The pretest–posttest structure enabled the researcher to quantify improvement in overall skill levels and in specific skill domains, such as crop production and fishery-related competencies.

Although the one-group pretest–posttest design does not include a comparison group, it remains helpful in examining instructional effectiveness in real classroom settings, particularly when the purpose is formative: to evaluate whether an intervention can improve learning outcomes and identify areas that may require adjustment. To strengthen the credibility of the results, the study applied consistent test procedures and scoring criteria for both the pretest and posttest, ensuring that any observed changes in performance could reasonably be linked to the intervention rather than to differences in assessment conditions.

Overall, the research design provided a practical, evidence-based approach to evaluating whether Activity-Based Learning Stations could enhance learners' AFA skills, while offering insights into the challenges learners encountered during station-based learning. These findings are intended to support instructional improvement in AFA and similar skills-based learning areas within junior high school settings.

2.2 Participants

The participants of this study were 40 Grade 7 learners enrolled in Agriculture and Fishery Arts (AFA) at Ballay National High School. The participants were selected using purposive sampling, as the study specifically targeted learners currently taking AFA and directly exposed to the instructional intervention. This sampling approach ensured that the participants were appropriate for the study's objectives, particularly in evaluating whether Activity-Based Learning Stations could improve AFA-related skills in an actual classroom setting.

The selected learners represented a typical group of Grade 7 students in a public secondary school setting, where practical skill development is expected as part of the Technology and Livelihood Education curriculum. Their participation was essential because the intervention required learners to engage in hands-on activities that involved skill performance tasks aligned with the AFA learning competencies. By focusing on Grade 7 learners, the study also captured

early-stage skill development, which is important because foundational competence in AFA is expected to be strengthened as learners progress through junior high school.

All participants took part in both the pretest and posttest assessments, allowing the study to compare their skill performance before and after exposure to the Activity-Based Learning Stations. Because the study used a one-group pretest–posttest design, maintaining the same participants throughout the study was necessary to measure performance change over time accurately.

Participation was carried out within normal instructional conditions, and learners were oriented on the purpose of the activities and the expectations during station-based learning. The learners worked individually and in small groups, depending on the requirements of each station, ensuring that every participant had opportunities to perform the required tasks and demonstrate competencies during the intervention period.

Overall, the participants provided a relevant sample for examining the effects of Activity-Based Learning Stations on AFA skill development, and their performance outcomes served as the primary basis for determining the instructional strategy's effectiveness.

2.3 Instrumentation

To evaluate the effectiveness of Activity-Based Learning Stations in enhancing learners' skills in Agriculture and Fishery Arts (AFA), the study used a skills assessment test administered as both a pretest and a posttest. This teacher-developed instrument was designed to measure learners' competency levels in key Grade 7 AFA domains, particularly crop production and fishery-related skills, using performance-based indicators aligned with expected learning outcomes. The same assessment tool and scoring criteria were applied during both testing periods to ensure that observed differences in scores reflected actual improvement in learners' skills rather than changes in test content or procedures.

In addition, a learner challenge checklist was employed to document common difficulties encountered during the station-based learning activities. The checklist captured practical barriers that could affect performance, such as time constraints per station, difficulty handling tools or materials, and confusion about task instructions. Responses were summarized using frequency counts and percentages to identify the most prevalent challenges, providing contextual information that supported the interpretation of learners' skill gains after the intervention.

2.4 Data Analysis

Data analysis was conducted using descriptive and inferential statistical procedures to determine learners' skill levels before and after the implementation of Activity-Based Learning Stations and to assess whether the observed changes were statistically significant. Descriptive statistics—specifically, means and descriptive interpretations—were used to summarize learners' pretest and posttest performance in Agriculture and Fishery Arts (AFA), including overall results and skill-domain scores. These measures provided a clear picture of how learners performed at baseline and how their performance shifted after exposure to the intervention.

To test the effectiveness of the intervention, the study applied a paired-samples t-test, which is appropriate for comparing the mean scores of the same participants across two testing periods (pretest vs. posttest). The test determined whether the improvement in learners' scores after the learning stations was statistically significant at the standard significance level ($\alpha = 0.05$). Results showed that the posttest mean was higher than the pretest mean, and the computed t-value indicated a significant gain in skill performance following the intervention.

For the learner challenge checklist, responses were analyzed using frequency counts and percentages to identify the most common difficulties encountered during the station activities. This analysis helped contextualize the quantitative findings by highlighting practical issues that may influence learner performance, such as time constraints, tool-handling difficulties, and unclear

instructions. Together, these data analysis procedures enabled the study to evaluate both the measurable effect of Activity-Based Learning Stations on AFA skills and the implementation challenges to be considered for future classroom application.

3 Results

The results indicate a clear improvement in learners' Agriculture and Fishery Arts (AFA) skills after the implementation of Activity-Based Learning Stations. Prior to the intervention, the learners' overall pretest performance yielded a mean score of 2.54, indicating Low Skill. After completing the station-based learning activities, their overall posttest performance increased to a mean score of 3.79, interpreted as High Skill. This shift suggests that the learning stations provided learners with more effective opportunities to practice and apply AFA competencies in a structured, performance-focused environment.

To determine whether the observed improvement was statistically significant, a paired-samples t-test was conducted comparing the pretest and posttest scores of the same group of learners. The analysis revealed a computed $t(39) = 14.37$ with an associated p-value ≈ 0.001, indicating a statistically significant difference between the pretest and posttest results. This confirms that the improvement in learners' performance was not due to chance, but was strongly associated with the instructional intervention implemented during the study.

In addition to performance gains, learners also reported specific challenges during the implementation of the learning stations. The most frequently reported difficulty was insufficient time to complete tasks per station (65%), followed by difficulty using tools and equipment (55%), and confusion with instructions (45%). These results suggest that while Activity-Based Learning Stations were effective in improving skills, successful implementation also requires careful attention to pacing, tool readiness, and clarity of task directions to enhance the learner experience and performance further.

4. Discussion

The findings of this study provide strong evidence that Activity-Based Learning Stations can significantly improve Grade 7 learners' skills in Agriculture and Fishery Arts (AFA). Learners' performance increased from a low skill level in the pretest ($M = 2.54$) to a High Skill level in the posttest ($M = 3.79$), and the paired-samples t-test confirmed that the improvement was statistically significant, $t(39) = 14.37$, $p \approx 0.001$. From an instructional standpoint, this suggests that station-based learning provided learners with structured opportunities to practice AFA competencies more consistently than conventional whole-class delivery, which is often constrained by time, limited tools, and large class sizes. In performance-based subjects like AFA, improvement is most likely when learners are repeatedly engaged in authentic tasks, rather than simply observing demonstrations or recalling procedures.

The significant increase in posttest scores is consistent with broader evidence that active learning approaches lead to stronger learning outcomes than traditional lecture-based methods. Freeman et al. (2014), in a large meta-analysis of STEM education research, found that active learning strategies increase student performance and reduce failure rates compared with lecture-only instruction. Although the present study was conducted in a junior high school AFA setting rather than higher education STEM contexts, the underlying learning mechanism remains comparable: learners improve when they actively participate in tasks that require thinking, doing, decision-making, and problem-solving. Activity-Based Learning Stations align with active learning because they encourage learners to engage directly with learning tasks, practice procedural steps, and develop competence through repeated performance and feedback.

More specifically, the gains observed in this study support evidence from the literature focused on station techniques. Şahin (2019) reported that learning stations have a positive overall effect on academic achievement when compared with traditional methods, largely because they

promote engagement and allow learners to interact with content in varied, activity-driven ways. In the context of AFA, this is especially relevant because competence requires physical execution and accuracy, which are difficult to develop without consistent opportunities for practice. The station format naturally increases hands-on engagement by allowing learners to rotate through tasks in smaller groups, rather than waiting passively for their turn in a whole-class activity. This structure likely contributed to the improved skill outcomes in this study by increasing the amount of meaningful practice per learner, even within the constraints of a typical public school classroom.

In addition, the intervention's effectiveness aligns with the curriculum's direction, which emphasizes applied, competency-based learning in EPP/TLE. The MATATAG Curriculum Guide highlights that AFA and other TLE components are intended to develop learners' practical skills and productive competence through engagement with real-world tasks. The improved performance in this study suggests that Activity-Based Learning Stations operationalize these expectations by transforming AFA learning outcomes from theoretical targets into concrete skill experiences. In other words, the strategy did not simply help learners "know" agriculture and fishery concepts—it helped them practice and demonstrate the skills the curriculum expects them to acquire.

While the results show that Activity-Based Learning Stations are effective, learners' reported implementation challenges highlight practical areas for improvement. The most common concern was insufficient time per station (65%), followed by difficulty using tools and equipment (55%) and confusion with instructions (45%). These difficulties are consistent with implementation issues documented in station rotation models, where pacing, clarity of task directions, and station management are frequently identified as barriers to success. The American Institutes for Research (2021) notes that station rotation models require careful planning to ensure that tasks are clearly structured, time allotment is realistic, and learners can transition smoothly between stations without losing instructional momentum. In AFA settings, these issues may become even more pronounced because learners often need more time for tool handling, safety compliance, and step-by-step task completion—particularly when learners are still developing foundational competence.

These challenges do not weaken the overall effectiveness of the intervention; instead, they provide direction for refining implementation. For example, the reported time constraint suggests that stations may need to be adjusted by reducing task complexity, extending time per station, or limiting the number of tasks per session so that learners can complete activities without rushing. The difficulty with tool use also underscores the importance of short pre-rotation demonstrations, safety orientations, or tool-handling practice before learners begin rotating. Finally, confusion with instructions suggests that station task guides should be simplified, made more visual, or delivered using step-by-step checklists, especially for learners who are still building procedural confidence. Addressing these issues would likely enhance both learner experience and skill gains, and may further increase the effectiveness of station-based instruction in future implementations.

Overall, the findings support the conclusion that Activity-Based Learning Stations are a feasible and effective instructional approach for enhancing Grade 7 learners' AFA skill performance. The strategy aligns with competency-based curriculum goals, is supported by active learning literature, and has demonstrated measurable improvement in learner outcomes. At the same time, the reported challenges emphasize that successful implementation depends not only on the strategy itself but also on practical factors such as station pacing, tool readiness, and instructional clarity. Future applications of the approach may benefit from improved station design, clearer task guides, and structured scaffolding to ensure that all learners can engage productively and confidently at each learning station.

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COMPARING ACADEMIC ACHIEVEMENT: LEARNERS PARTICIPATING IN COMPETITIVE SPORTS VERSUS NON-PARTICIPATING LEARNERS

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Abstract

This study examined differences in academic achievement and time management skills between student-athletes and non-athletes in public secondary schools in Dagupan City. A descriptive-comparative quantitative design was used. Three hundred fifty Grade 10 to Grade 12 learners were selected through stratified random sampling and classified according to participation in competitive school sports. Academic achievement was determined using official general point averages (GPA) from the school registrar. At the same time, time management was assessed using a validated Likert-type survey that covered planning, prioritizing, scheduling, and self-monitoring. Descriptive statistics and independent-samples t-tests at $\alpha = 0.05$ were applied.

Results showed that non-athletes posted a slightly higher mean GPA ($M = 89.25$) than student-athletes ($M = 87.50$), but the difference was not statistically significant ($p = 0.063$). In contrast, student-athletes demonstrated significantly stronger time management skills ($M = 4.52$) than non-athletes ($M = 3.85$), with a highly significant difference ($p < 0.001$). These findings indicate that engagement in competitive sports does not impair academic performance and may support the development of disciplined routines and efficient use of study time.

Based on these outcomes, an Academic-Athletic Balance Initiative is proposed to enhance time management among all learners, especially non-athletes. The program includes peer mentoring, time-management workshops, training in digital or paper planning tools, and recognition for exemplary academic–co-curricular balance. The study underscores the importance of structured school support for holistic learner success. Future studies may explore other variables such as motivation, parental support, and training load using longitudinal designs to clarify causal pathways across diverse school settings.

Keywords: Student-Athletes, Non-Athletes, Academic Achievement, GPA, Time Management, Competitive Sports, Secondary Education

1. Introduction

Participation in competitive school sports is often viewed as a double-edged experience for adolescents. On one hand, organized athletics are linked to physical fitness, social belonging, and the development of discipline and teamwork—skills considered valuable for schooling and later life (National Center for Education Statistics [NCES], 1995; Sports Medicine Weekly, 2025). On the other hand, students who train and compete regularly must also meet academic deadlines, attend classes, and complete requirements comparable to their non-athlete peers. This dual role can create real pressure on students, parents, and teachers who worry that athletic demands may reduce study time, increase fatigue, or distract learners from academic goals. Because secondary education is a crucial period for establishing achievement patterns and life skills, understanding how sports involvement relates to academic performance and time use remains a practical concern for schools.

Research on the academic effects of sports participation has produced mixed results. Several large-scale studies suggest that athletic involvement may be positively associated with academic outcomes, such as higher grades, greater school engagement, and a higher likelihood of graduation, possibly because sports cultivate motivation, school attachment, and structured routines (Molitor & Leigh, 2010; Sports Medicine Weekly, 2025; HealthDay, 2025). In contrast,

other investigations indicate that the relationship is not always straightforward; academic advantages may depend on factors such as the intensity of training, type of sport, school support systems, or the student's pre-existing motivation (Molitor & Leigh, 2010; Balancing Academics & Athletics, 2023). Some authors note that observed grade differences can be small or statistically non-significant once background variables are considered, implying that participation alone does not guarantee better or worse academic performance (Balancing Academics and Athletics, 2023; Molitor & Leigh, 2010). These inconsistencies highlight the need to examine not only outcomes such as GPA but also the behavioral skills that might explain why student-athletes succeed—or struggle—academically.

One such behavioral skill is time management. Time management refers to a learner's ability to plan tasks, prioritize responsibilities, allocate study and leisure time effectively, and monitor progress toward goals. Across educational contexts, effective time management has been repeatedly linked to better academic achievement, lower procrastination, and stronger self-regulation (Inspire, 2025; Kaushik & Sharma, 2021). Students who manage time well tend to distribute effort more evenly, avoid last-minute cramming, and maintain consistent attendance and task completion, which supports higher performance over time (Inspire, 2025; Kaushik & Sharma, 2021). For student-athletes, time management becomes even more central because training, travel, and competitions impose fixed schedules that must be balanced with classwork. Qualitative and quantitative studies in the Philippines and elsewhere describe how athletes often rely on calendars, peer coordination, and strict routines to keep up with schoolwork, and how these practices can become transferable academic habits (Sabate et al., 2024; Time Management Practices, 2024). This suggests that sports participation may indirectly influence academic performance by enhancing time management.

However, local evidence remains limited and sometimes context-specific. Philippine studies focusing on student-athletes commonly report that sports involvement does not necessarily lower grades and may foster self-discipline and time-use strategies, yet findings vary across regions and samples (Athletic Participation, Time Management and Academic Performance, 2023; Student-Athletes Involvement in Sports, 2024). Moreover, many existing works examine athletes only, without directly comparing them to non-athletes within the same school environment, making it hard to determine whether time-management strengths are unique to athletes or more broadly distributed among learners. Differences in school culture, coaching expectations, and resource availability can also shape student experiences, so findings from one locale should not be assumed to generalize to another (Athletic Participation, Time Management and Academic Performance, 2023; Sabate et al., 2024). For Dagupan City public secondary schools, there is little systematic comparison of academic achievement and time management between student-athletes and their non-athlete peers, despite the city's active participation in inter-school competitions and the steady push for holistic learner development.

Anchored on these gaps, the present study investigates whether participation in competitive school sports is associated with differences in (a) academic achievement and (b) time management skills among public secondary learners in Dagupan City. The study uses a descriptive-comparative quantitative design to compare student-athletes and non-athletes on official GPA records and a validated time-management survey covering planning, prioritization, scheduling, and self-monitoring. Independent-samples t-tests are employed to determine whether group differences are statistically significant. By including both academic measures and time-management indicators, the study is positioned to clarify not just *whether* athletes differ academically from non-athletes, but also *how* their daily self-regulation may relate to achievement.

The study is significant for several reasons. First, it contributes local evidence to an ongoing policy and educational debate: whether schools should limit sports participation to protect academics or instead expand athletic programs to support learner growth. Second, by focusing

on time management, the study highlights a teachable skill that schools can develop for all students, regardless of athletic status. If student-athletes demonstrate stronger time-management competencies while maintaining comparable GPAs, then sports participation is a constructive context for building academic-supportive habits. Conversely, if non-athletes show equal or stronger skills, schools may need broader interventions beyond athletics to cultivate effective time use. Finally, results can guide pragmatic school-level programs that strengthen academic–co-curricular balance, promote well-being, and support equitable performance across learner groups.

In sum, the existing literature suggests that sports participation may be neutral or beneficial for academic outcomes. Still, the effects are inconsistent and may depend on mediating skills, such as time management. Given the limited comparative evidence in Dagupan City, this study aims to provide a clearer empirical basis for supporting student development in both classrooms and athletic arenas.

2. Method

2.1 Research Design

The study employed a descriptive-comparative quantitative research design to determine whether significant differences existed in academic achievement and time management skills between student-athletes and non-athletes in public secondary schools in Dagupan City. This design was appropriate because it allows systematic comparison of two naturally occurring groups without manipulating variables, thereby describing current conditions and testing group differences statistically. Student-athletes and non-athletes were identified through stratified random sampling from Grades 10 to 12; academic achievement was measured using official GPA records from the school registrar; and time management was assessed using a validated Likert-type survey covering planning, prioritization, scheduling, and self-monitoring. The collected data were analyzed using descriptive statistics to summarize group performance and independent-samples t-tests at the 0.05 level of significance to evaluate whether observed mean differences in GPA and time management scores were statistically meaningful.

2.2 Participants

The study was 350 public secondary school learners from Dagupan City, drawn from Grades 10 to 12 during the stated school year, and selected through stratified random sampling to ensure balanced representation across grade levels and student categories. They were grouped into student-athletes and non-athletes based on official school records of participation in competitive sports programs; student-athletes were those actively engaged in inter-school or division-level competitions, while non-athletes were those not involved in any competitive athletic activity. This grouping enabled a valid comparison of naturally occurring learner populations within the same educational context. Academic achievement data (GPA) for all participants were obtained from the registrar with proper permissions, and each respondent also completed the time-management survey, ensuring that both outcome variables were measured consistently across the two participant groups.

2.3 Instrumentation

The study utilized two primary instruments to gather the needed data: (1) official academic records and (2) a standardized time-management questionnaire. Academic achievement was measured using participants' General Point Averages (GPAs), obtained from the school registrar to ensure objective, verifiable performance data. Time management skills were assessed using a validated Likert-type survey adapted from established time-management frameworks, which measured key domains such as planning, prioritization, scheduling, and self-monitoring of tasks. The questionnaire employed a 5-point scale ranging from strongly disagree to strongly agree,

allowing respondents to indicate the frequency or consistency of their time-use behaviors. Prior to administration, the instrument underwent expert validation and reliability testing to confirm clarity, content relevance, and internal consistency, ensuring it appropriately captured the time-management practices of both student-athletes and non-athletes for accurate group comparisons.

2.4 Data Analysis

The study employed a quantitative approach within a descriptive-comparative design. First, the researchers organized and coded the GPA records and time-management survey responses, then applied descriptive statistics—specifically, frequency counts, percentages, means, and standard deviations—to summarize the academic achievement and time-management levels of student-athletes and non-athletes. After checking the completeness of responses and ensuring that assumptions for parametric testing were acceptable, the independent-samples t-test was used to compare the mean GPA and mean time-management scores of the two groups. All tests were evaluated at the 0.05 level of significance, allowing the researchers to determine whether observed differences were statistically meaningful and to either reject or fail to reject the stated null hypotheses regarding group differences in academic performance and time management skills.

3. Results

The study found that, in terms of academic achievement, non-athletes had a slightly higher mean General Point Average (GPA) than student-athletes. Specifically, non-athletes posted a mean GPA of 89.25, while student-athletes registered a mean GPA of 87.50. Although this difference suggests a small numerical advantage for non-athletes, statistical testing showed that the gap was not meaningful enough to be considered significant at the 0.05 level. The independent-samples t-test yielded a p-value of 0.063, leading to the acceptance of the null hypothesis for academic achievement. This indicates that participation in competitive sports did not significantly affect learners' academic performance in the study context.

Further analysis showed that both groups generally maintained satisfactory academic standing, suggesting that student-athletes met scholastic expectations despite the additional demands of training and competition. The absence of a significant GPA difference suggests that the structured environment of competitive sports may not hinder classroom learning, and that learners in both categories can achieve comparable academic outcomes when given similar school conditions and support. This result also highlights that multiple factors beyond athletic involvement alone influence academic success in Dagupan City public secondary schools.

In contrast, the findings on time management skills showed a clear, statistically significant difference between the two groups. Student-athletes achieved a higher overall mean time-management score ($M = 4.52$) than non-athletes ($M = 3.85$), reflecting stronger performance across key domains such as planning, prioritization, scheduling, and task monitoring. The independent-samples t-test yielded a p-value of 0.000 ($p < .001$), leading to rejection of the null hypothesis regarding time management. This confirms that student-athletes possess significantly better time-management skills than their non-athlete counterparts.

This significant advantage among student-athletes may be attributed to the inherently structured nature of sports participation. Regular training sessions, strict schedules, and competitive commitments likely require athletes to organize their daily routines efficiently, balance schoolwork with physical preparation, and make the most of limited free time. Over time, these demands may cultivate discipline and habitual planning behaviors that translate into stronger time-management competence, even if such skills do not necessarily produce higher GPA outcomes in the present sample.

Given these results, the study emphasized the need for school-based interventions that develop time-management skills among all learners, particularly non-athletes who showed

comparatively lower scores. The proposed Academic–Athletic Balance Initiative was grounded in evidence that time management can be strengthened through mentoring, workshops, and training in planning tools. Overall, the results suggest that while sports participation does not significantly raise or lower academic achievement, it is positively associated with better time-management skills—an essential competency that schools can intentionally nurture to support holistic learner success.

4. Discussion

The findings of the present study corroborate a large body of literature showing that participation in competitive sports does not necessarily undermine students' academic achievement. In this study, non-athletes had a marginally higher mean GPA than student-athletes, but the difference was not statistically significant. Similar patterns have been reported in longitudinal and causal-comparative research, indicating that, after considering contextual factors, athletes and non-athletes often attain comparable academic outcomes and that sports participation alone is not a reliable predictor of higher or lower GPA (Molitor & Leigh, 2010; U.S. Centers for Disease Control and Prevention [CDC], 2010). These studies argue that academic performance is shaped by multiple interacting influences—family background, school engagement, and motivation-so the academic effect of athletics may be neutral in many settings, matching the non-significant group difference observed in Dagupan City.

The results also align with Philippine-based research suggesting that student-athletes can maintain satisfactory grades despite the demands of athletics. For instance, studies on secondary or tertiary student-athletes in the Philippines report that athletes generally maintain acceptable academic standing and that sports involvement does not automatically translate into poor classroom performance (Student-Athletes Involvement in Sports and Their Academic Performance, 2024; Effects of Sports Participation on Academic Performance in Adolescents, 2024). The Dagupan findings reinforce this view: although athletes' GPA was slightly lower numerically, their performance remained within the same overall achievement band as non-athletes, supporting the argument that well-managed sports participation can coexist with academic responsibility.

More strongly, the study's significant result on time management skills is consistent with related research positioning time management as a key advantage cultivated through athletics. The present study found that student-athletes demonstrated significantly higher time-management scores than non-athletes. This corroborates evidence from San Isidro, Leyte, where athletic participation was positively associated with stronger time-management behaviors and where time management was shown to support athletes' academic functioning (Athletic Participation, Time Management and Academic Performance of Student-Athletes, 2023). Qualitative work likewise shows that athletes develop routines, scheduling habits, and prioritization strategies due to fixed training and competition timetables, which then transfer into school-related task management (Sabate et al., 2024). Together, these studies match the Dagupan pattern: athletes' structured commitments appear to foster more disciplined time use.

Additionally, the Dagupan results align with broader international trends that link sports participation to self-regulation skills rather than to automatic GPA gains. Several studies report that athletes may not consistently outperform non-athletes in grades. However, they tend to exhibit better academic-enabling behaviors—such as persistence, planning, and organized routines—which are closely tied to time management (Balancing Athletic and Academic Excellence, 2024; Time Management Practices and Student-Athletes' Performance, 2024). This helps explain why the current study detected a significant difference in time management but not in GPA: athletes' behavioral strengths may serve as protective or compensatory factors, keeping achievement stable rather than pushing it dramatically higher.

Finally, the proposed Academic–Athletic Balance Initiative is supported by recommendations from related studies that emphasize structured school interventions to strengthen time management and academic–co-curricular balance for all learners. Prior research highlights that time management can mediate the athletics–achievement relationship and that schools should provide coaching, mentoring, and planning support, especially for students without built-in structured routines (Athletic Participation, Time Management and Academic Performance of Student-Athletes, 2023; CDC, 2010). Thus, both the outcomes and the programmatic direction of this study are consistent with existing evidence, while adding localized comparative data from Dagupan City.

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EFFECTS OF PHYSICAL ACTIVITIES ON THE ACADEMIC PERFORMANCE OF COLLEGE STUDENTS

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Abstract

This study examined the effects of physical activity on the academic performance of college students at Lyceum-Northwestern University in Dagupan City. Anchored in the Cognitive Activation Theory of Stress, Self-Determination Theory, and Multiple Intelligences Theory, it tested the assumption that regular movement supports learning by improving stress regulation, motivation, and cognitive functioning. A quantitative correlational design was employed. One hundred college students answered a structured questionnaire that measured their weekly physical activity frequency and level (inactive, moderately active, active, and highly active). Academic performance was determined using self-reported grade point average (GPA) and academic achievement scores. Descriptive statistics summarized activity patterns and performance levels, while Pearson correlation assessed the relationship between physical activity and academic outcomes.

Findings showed that most respondents were moderately active (40%), while 25% were inactive, 25% active, and 10% highly active. Academic performance increased with activity level. Inactive students posted a satisfactory GPA (M = 2.25), moderately active students a good GPA (M = 2.00), active students a very good GPA (M = 1.75), and highly active students an excellent GPA (M = 1.50). Active students likewise obtained higher academic achievement (M = 1.82, very good) than inactive peers (M = 2.25, satisfactory). Overall, physical activity frequency showed a strong, statistically significant positive relationship with academic performance ($r = 0.68$, $p < .05$).

The results indicate that consistent engagement in physical activities is associated with better scholastic outcomes among college students. The study recommends strengthening campus wellness and fitness programs, integrating accessible physical activity into student life, and encouraging healthier routines to support long-term well-being and academic success.

Keywords: Physical Activity, Academic Performance, GPA, College Students, Wellness Program, Correlational Study

1. Introduction

Physical activity is widely recognized as a cornerstone of health and well-being. However, many university students struggle to meet recommended levels as academic workloads, screen-based learning, and sedentary leisure compete for time and energy. Global guidelines emphasize that adults should accumulate 150–300 minutes of moderate-intensity aerobic activity (or 75–150 minutes of vigorous activity) per week to achieve meaningful physical and mental health benefits (World Health Organization [WHO], 2020; Bull et al., 2020). Despite these clear recommendations, physical inactivity remains common in higher-education settings, leaving students vulnerable to stress, fatigue, and reduced cognitive readiness. In the Philippine context, recent evidence among tertiary students indicates that physical activity and related health behaviors remain uneven, with a substantial proportion of students reporting low levels of physical activity even after the return to normal campus life (Guinto et al., 2025). These trends underscore the practical relevance of examining how activity habits relate to academic functioning in college populations.

The link between physical activity and academic performance has been studied extensively, with the majority of evidence suggesting a generally positive association. Reviews of school-age populations show small but consistent academic benefits of physical activity, particularly through improved classroom behavior, attention, and cognitive function (Álvarez-Bueno et al., 2017; Singh et al., 2020). Although much of the earlier literature focused on children and adolescents, research is increasingly extending to university students. A systematic review and meta-analysis centered on university populations highlighted a stress-buffering pathway: physically active students often demonstrate lower perceived stress and, in turn, better academic outcomes, although study designs vary and effect sizes are heterogeneous (Wunsch et al., 2021). Related work in higher education also notes that physical activity interventions tend to improve mental health indicators—stress, anxiety, and depressive symptoms—which are known correlates of academic engagement and achievement (Deliens et al., 2024; Guo et al., 2024). In other words, even when direct causal links to grades are difficult to establish, physical activity appears to strengthen psychological conditions that support learning.

Several mechanisms explain why physically active students may perform better academically. First, physical activity enhances cognitive processes that are central to learning, including executive function, memory, and attentional control. Large-scale undergraduate research using objective activity patterns found that more frequent and sustained activity were associated with higher academic achievement, suggesting that movement supports information processing and sustained study performance (Du et al., 2023). Second, activity improves emotion regulation and resilience, which are critical for maintaining academic focus under pressure. Experimental evidence indicates that structured exercise programs can improve cognitive control and emotion regulation among stressed college students, helping them respond adaptively to academic demands (Zhang et al., 2025). Third, physical activity is strongly related to motivation and self-regulation. From a self-determination perspective, exercise supports feelings of competence, autonomy, and social connection, which can generalize to academic goals and persistence (Wunsch et al., 2021). Together, these pathways align with stress-coping frameworks that view physical activity as a behavioral resource that offsets physiological and psychological strain, thereby protecting performance in demanding environments.

Even with growing evidence, findings among university students remain mixed in part because of contextual differences. Some studies report strong positive relationships between physical activity and GPA, while others find weaker or inconsistent links depending on activity type, frequency, or student characteristics (Tobi et al., 2022; Wunsch et al., 2021). Such variability suggests that local investigations are necessary to clarify how physical activity operates within specific settings. Campus culture, facility access, commuting patterns, and academic structures can shape both activity habits and performance outcomes. Moreover, Philippine higher education has unique features—such as heavy commuting for many students and varying institutional support for wellness—that may alter the role of physical activity in student success (Guinto et al., 2025). Local empirical work is therefore essential not only to test whether global patterns hold, but also to generate evidence for campus-based wellness programs tailored to Filipino students.

This study addresses these needs by examining how the frequency of physical activity relates to the academic performance of college students at Lyceum-Northwestern University in Dagupan City. Using a quantitative correlational design, the study assesses students' activity levels and compares these with indicators of academic performance, including grade point average and academic achievement measures. By focusing on a Philippine college sample, the research provides context-specific evidence in an area where local studies remain limited and where student well-being has become increasingly salient after years of disrupted routines. Understanding this relationship may guide institutional decision-making on fitness initiatives, physical education programming, and broader student-support systems. Ultimately, the study aims to clarify whether encouraging consistent physical activity can serve as a feasible, low-cost

strategy to enhance academic outcomes while simultaneously promoting healthier lifestyles among college students.

2. Method

2.1 Research Design

The study employed a quantitative correlational research design to determine the relationship between college students' physical activity and academic performance. This design was appropriate because the purpose was not to manipulate variables but to measure naturally occurring differences in students' activity levels and examine how these relate to academic outcomes. Data were collected from 100 college students using a structured questionnaire that classified respondents by weekly physical activity frequency (inactive, moderately active, active, or highly active). At the same time, academic performance was assessed through self-reported Grade Point Average (GPA) and academic achievement scores. Descriptive statistics (frequencies, percentages, and means) were used to summarize activity patterns and performance levels. Inferential statistics—specifically Pearson product–moment correlation to test the strength and significance of relationships and a t-test to compare academic achievement between active and inactive groups—were applied to address the research questions and evaluate the null hypotheses within the IMRAD framework.

2.2 Participants

The participants of the study were 100 college students enrolled at Lyceum–Northwestern University in Dagupan City, who served as the primary source of data for examining the relationship between physical activity and academic performance. Respondents were selected from different year levels and programs to reflect a range of academic experiences, and they were grouped according to their reported weekly physical activity frequency (inactive, moderately active, active, and highly active). Participation was voluntary, and students were included if they were currently enrolled in the college department and willing to provide information about their physical activity habits and academic performance (GPA and achievement scores). Prior to data collection, respondents were informed of the study's purpose, assured of confidentiality, and asked to complete the questionnaire honestly, ensuring that ethical standards in participant selection and involvement were observed within the IMRAD structure.

2.3 Instrumentation

The study utilized a researcher-made structured questionnaire as its primary instrument to collect data on both physical activity and academic performance within the IMRAD framework. The tool was organized into three parts: (1) a profile section that gathered basic demographic information of the respondents; (2) a physical activity section that asked students to report the frequency of their weekly participation in physical activities, allowing classification into inactive, moderately active, active, and highly active groups; and (3) an academic performance section that elicited respondents' self-reported Grade Point Average (GPA) and academic achievement indicators, supplemented by items on study-related perceptions to contextualize performance outcomes. The questionnaire was designed to align directly with the study's variables and research questions, ensuring that the data gathered could be quantified and analyzed using descriptive statistics, Pearson's correlation, and t-tests.

2.4 Data Analysis

The study applied both descriptive and inferential statistical techniques consistent with a quantitative correlational IMRAD approach. After collecting the completed questionnaires, responses were tallied and organized to determine students' physical activity categories and

academic performance levels. Descriptive statistics—specifically frequency counts, percentages, and weighted means—were used to summarize the distribution of physical activity frequency (inactive to highly active) and GPA/achievement classifications. To test the study's central relationship, the Pearson product–moment correlation (r) was computed to assess the strength and direction of the association between physical activity frequency and academic performance, with significance evaluated at the 0.05 alpha level. In addition, a t-test for independent samples was employed to determine whether there was a statistically significant difference in academic achievement scores between physically active and inactive students. These analyses directly addressed the research questions and provided the statistical basis for accepting or rejecting the null hypotheses.

3. Results

The results showed that college students differed notably in how often they engaged in physical activities. Most respondents were moderately active, participating in physical activity about two to three times per week (40%). A quarter of the students were inactive (0–1 time per week), another 25% were active (4–5 times per week), and a smaller group were highly active (6 or more times per week). This distribution indicates that while many students maintain some level of activity, a substantial portion still falls short of regular exercise patterns, suggesting room for greater participation in routine physical movement.

In terms of academic performance, respondents generally clustered in the good-to-very-good GPA range, but performance varied across activity categories. Overall GPA results revealed that 35% of students had “very good” grades (1.50–1.99), 30% were in the “good” range (2.00–2.49), 20% were “satisfactory” (2.50–2.99), and only 15% achieved an “excellent” GPA (1.00–1.49). These findings suggest that most students perform reasonably well academically, yet a smaller segment achieves excellence.

When GPA was compared across physical activity levels, a clear upward pattern emerged: students who were more physically active tended to have higher GPAs. Inactive students posted only a satisfactory mean GPA (M = 2.25), moderately active students reached a good mean GPA (M = 2.00), active students obtained a very good mean GPA (M = 1.75), and highly active students achieved an excellent mean GPA (M = 1.50). This stepwise improvement across activity groups strongly suggests that regular physical activity participation is associated with stronger scholastic performance.

A similar trend appeared in academic achievement scores. Students categorized as physically active achieved a very good average (M = 1.82), whereas inactive students achieved only a satisfactory average (M = 2.25). The difference suggests that active students may benefit from improved concentration, energy, and stress regulation, all of which support learning and test performance. Thus, both GPA and achievement indicators converged in showing that greater participation in activities is associated with higher academic outcomes.

Finally, inferential analysis confirmed that this pattern was not due to chance. The Pearson correlation between physical activity frequency and academic performance was strong, positive, and statistically significant ($r = 0.68$, $p < .05$), meaning that as physical activity increased, academic performance also tended to improve. Taken together, these results supported rejecting the null hypotheses. They reinforced the study’s main conclusion: consistent physical activity is meaningfully linked with better academic performance among college students, highlighting the value of wellness and fitness initiatives within the university setting.

4. Discussion

The findings of the present study corroborate a broad body of literature showing that higher physical activity participation is associated with stronger academic outcomes. In this research, increasing activity frequency was associated with progressively higher GPAs and

achievement scores, and the overall relationship was strong and significant (r = 0.68). Similar positive associations have been reported among undergraduates in other contexts. For example, Wehler (2023) found that moderate-to-vigorous physical activity was positively associated with college students' GPAs and academic skills, reinforcing the idea that sustained exercise engagement aligns with better scholastic performance.

The pattern in this study also aligns with higher-level syntheses, suggesting that physical activity is generally beneficial—or at least not harmful—to academic performance. An umbrella review by Singh et al. (2020) concluded that most systematic reviews and meta-analyses report small but consistent positive effects of chronic physical activity on academic achievement, with clearer benefits emerging when activity is sustained over time rather than performed sporadically. Although Singh et al. (2020) focused largely on school-age populations, the direction and logic of their findings mirror those of the present results among college students, suggesting that the academic advantage of regular activity may extend across educational levels.

Further, the study's results are supported by evidence emphasizing cognitive pathways through which activity enhances learning. Du et al. (2023) used large-scale behavioral data and machine-learning approaches. They showed that college students who engaged more frequently in physical activity tended to achieve higher academic achievement, suggesting improvements in attention, memory, and executive functioning. This provides a plausible explanation for why students in the current study who were active or highly active achieved "very good" to "excellent" GPA levels compared with inactive peers.

The present findings are also consistent with research highlighting psychological mechanisms—especially stress and mental well-being—as key mediators. Wunsch et al. (2021) reviewed university-based evidence and reported that physical activity often relates to lower stress, which, in turn, supports academic performance, even though direct activity–performance correlations vary across studies. In the same vein, systematic reviews of college populations indicate that physical activity interventions reliably improve mental health indicators (e.g., reduced stress and anxiety, better well-being), strengthening students' capacity to focus, persist, and perform academically (Huang et al., 2024; Frontiers in Psychology review, 2025). These stress-buffering and well-being pathways fit closely with the present study's theoretical grounding and help explain the higher achievement scores among active students.

At the same time, this study adds to the literature by providing clear evidence from a Philippine university setting, where local corroborative data remain limited. Prior syntheses note heterogeneity and occasional null results in university samples, often due to differences in measurement tools, timing (e.g., exam vs. non-exam periods), and contextual factors such as campus culture or lifestyle demands (Wunsch et al., 2021). The strong positive relationship observed here, therefore, strengthens the argument that—within this specific institutional context—consistent physical activity is a meaningful contributor to academic success and supports calls for campus wellness programs tailored to student realities.

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GRADE 7 LEARNERS' PERCEPTION AND MOTIVATION IN MAPEH: A BASIS FOR ENHANCED INSTRUCTIONAL STRATEGIES

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Abstract

This study examined Grade 7 learners' perception and motivation in Music, Arts, Physical Education, and Health (MAPEH) and determined how teachers' instructional strategies relate to these variables. Grounded in Self-Determination Theory, Expectancy–Value Theory, Constructivist Learning Theory, and Keller's ARCS model, the research employed a descriptive–correlational design. Researcher-made Likert-type questionnaires were administered to Grade 7 students and MAPEH teachers in a public junior high school during School Year 2024–2025. Data were analyzed using frequency counts, weighted means, standard deviations, and Pearson product–moment correlation. Results revealed that learners' perception of MAPEH was high across the dimensions of value, enjoyment, and relevance, indicating that students generally see the subject as meaningful, engaging, and connected to real-life experiences. Motivation levels were likewise high, with teacher encouragement emerging as the strongest motivating factor. Reported instructional strategies—such as multimedia integration, demonstrations, collaborative activities, and performance-based tasks—were frequently utilized in classes. Correlation analysis showed significant positive relationships between perception and motivation, and between instructional strategies and both learner perception and motivation. These findings suggest that when students perceive MAPEH as valuable and enjoyable, their motivation increases, and that engaging, student-centered teaching approaches further strengthen both outcomes. An action plan was developed focusing on real-life contextualization, technology-supported and gamified activities, collaborative performance tasks, teacher professional development, and inclusive learning environments. The study recommends sustained use and enhancement of motivating strategies to improve learner engagement and achievement in MAPEH, thereby promoting continuous classroom improvement.

Keywords: MAPEH, Learner Perception, Learner Motivation, Instructional Strategies, Grade 7, Descriptive–Correlational Study

1. Introduction

Music, Arts, Physical Education, and Health (MAPEH) is a core learning area in the junior high school curriculum that aims to develop learners holistically across aesthetic, physical, emotional, and health-related domains. Through music and arts, students cultivate creativity, cultural literacy, and self-expression; through physical education, they strengthen fitness, discipline, teamwork, and lifelong activity habits; and through health education, they gain knowledge and attitudes for well-being and disease prevention. International literature consistently links participation in arts and physical education with improved cognitive engagement, socio-emotional development, and academic persistence (UNESCO, 2006; UNESCO, 2015). Despite this value, MAPEH is often perceived by learners as less academically demanding than other subjects, leading to uneven engagement and motivation—especially at the Grade 7 level, where students are adjusting to more complex expectations, new peer contexts, and teacher styles.

Learners' perception of a subject—how meaningful, enjoyable, and relevant they find it—plays a decisive role in how they participate in learning tasks. Expectancy–Value Theory explains that students invest effort in activities they consider valuable, interesting, and useful, particularly when they believe they can succeed (Eccles & Wigfield, 2002). In MAPEH classes, perception may be shaped by signals about the subject's real-life importance, opportunities for creativity and performance, or beliefs that the skills are applicable beyond school. When students view MAPEH as relevant to identity, health, or future goals, they become more inclined to engage actively, practice persistently, and value feedback. Conversely, low perceived value or relevance can result in avoidance, passive compliance, or minimal effort.

Motivation is likewise central to meaningful learning in MAPEH. Self-Determination Theory emphasizes that students sustain motivation when learning environments satisfy three psychological needs: autonomy (feeling of choice and ownership), competence (feeling capable), and relatedness (feeling supported and connected) (Deci & Ryan, 2000). MAPEH is uniquely positioned to nurture these needs through creative tasks, cooperative performance, and mastery-oriented physical activities. However, if activities are overly teacher-directed, competitive without support, or disconnected from students' experiences, motivation can decline. Grade 7 learners, in particular, may require intentional scaffolding to build confidence in performance tasks, movement skills, and health decision-making.

Instructional strategies are among the strongest school-based contributors to learner motivation and perception. Keller's ARCS model explains that motivation increases when instruction captures attention, establishes relevance, builds confidence, and provides satisfaction (Keller, 1987). In the context of MAPEH, attention may be sustained through varied routines, multimedia resources, and interactive demonstrations; relevance may be strengthened by connecting activities to everyday fitness, cultural practices, or personal wellness; confidence may grow through guided practice and feedback; and satisfaction may be supported through recognition and meaningful performance opportunities. Constructivist learning perspectives further argue that students learn best when they actively construct meaning through authentic tasks, social interaction, and reflection (Vygotsky, 1978). Thus, collaborative performances, project-based outputs, and activity-centered lessons are expected to influence how learners perceive MAPEH and their motivation to learn.

Recent educational discussions have also highlighted that technology-supported, student-centered approaches can broaden engagement in the arts and physical education by increasing interactivity, personalization, and access to diverse content. When teachers integrate digital music tools, video-based skill modeling, gamified fitness activities, or online health modules, learners may perceive the subject as more contemporary and aligned with their interests. Still, technology alone does not guarantee motivation; rather, its effectiveness depends on how it is used to support autonomy, competence, and relevance. Understanding how Grade 7 learners currently perceive MAPEH, what motivates them, and what strategies teachers commonly employ is therefore essential for evidence-based classroom improvement.

In many school settings, MAPEH teachers observe that some Grade 7 learners participate enthusiastically in performance tasks and physical activities, while others remain hesitant, disengaged, or anxious about being evaluated. This divergence may reflect differences in perceived enjoyment, value, and relevance, as well as differences in the motivational climate created by instructional approaches. Identifying these patterns matters because early secondary school experiences can shape long-term attitudes toward arts participation, physical activity, and health behaviors (UNESCO, 2015). If learners build positive perceptions and stable motivation at the Grade 7 stage, they are more likely to sustain engagement across later grade levels and apply MAPEH competencies outside the classroom.

Anchored in these theoretical and practical considerations, the present study examines Grade 7 learners' perceptions and motivations in MAPEH and explores how these factors relate

to teachers' instructional strategies. Specifically, the study assesses learners' perceptions of value, enjoyment, and relevance and measures motivation using indicators consistent with intrinsic and extrinsic engagement, including the influence of teacher encouragement. It also describes the instructional strategies frequently used by MAPEH teachers and tests the relationships among these variables using a descriptive–correlational design. By clarifying how perception and motivation interplay within the MAPEH classroom—and how teaching strategies are associated with both—this research aims to provide an empirical basis for enhancing instruction. The results intend to guide teachers and school leaders in designing motivating, relevant, and learner-centered MAPEH experiences that support holistic development, sustained participation, and improved learning outcomes for Grade 7 students.

2. Method

2.1 Research Design

The study employed a descriptive–correlational research design to determine the levels of Grade 7 learners' perception and motivation toward MAPEH and to examine the relationships among these variables and teachers' instructional strategies. This design was appropriate because it allowed the researcher to describe existing conditions as they naturally occurred in the classroom without manipulating variables, while also testing the strength and direction of associations between perception, motivation, and instructional practices. Data were gathered through researcher-made Likert-type survey questionnaires administered to Grade 7 students and MAPEH teachers, and results were summarized using weighted means and standard deviations; Pearson product–moment correlation was then used to establish whether significant relationships existed among the key study variables, providing an empirical basis for proposing enhanced instructional strategies.

2.2 Participants

The participants in the study were Grade 7 learners and MAPEH teachers from a public junior high school during School Year 2024–2025. The student-respondents served as the primary source of data for assessing perceptions of MAPEH in terms of value, enjoyment, and relevance, as well as their level of motivation to learn the subject. The teacher-respondents, on the other hand, provided data on the instructional strategies commonly used in MAPEH classes. By involving both learners and teachers, the study was able to capture a more comprehensive view of classroom experiences and examine how teaching practices relate to students' perception and motivation within the natural school setting.

2.3 Instrumentation

The study used researcher-developed survey questionnaires as the primary instruments for data collection, consisting of structured Likert-type scales explicitly designed for Grade 7 learners and MAPEH teachers. The student questionnaire measured learners' perceptions of MAPEH across the dimensions of value, enjoyment, and relevance, as well as their motivation toward the subject through indicators of engagement and influencing factors such as teacher encouragement. The teacher questionnaire gathered information on the frequency and extent of instructional strategies employed in MAPEH classes, including multimedia use, demonstrations, collaborative activities, and performance-based tasks. Prior to administration, the instruments were subjected to expert validation to ensure alignment with the study variables and to pilot-test reliability. These tools enabled the systematic quantification of respondents' views and practices necessary for descriptive analysis and correlational testing.

2.4 Data Analysis

The study followed a quantitative approach aligned with the descriptive–correlational design. After collecting completed Likert-type questionnaires from Grade 7 learners and MAPEH teachers, responses were tallied and organized for statistical analysis. Frequency counts were used to describe respondent distributions. At the same time, weighted means and standard deviations summarized learners' perceptions (value, enjoyment, and relevance), motivation toward MAPEH, and the extent of instructional strategies employed by teachers. To determine whether significant relationships existed among the key variables, the Pearson product–moment correlation coefficient (r) was applied, with corresponding p-values interpreted to test the null hypotheses. This analytic procedure provided both descriptive evidence of prevailing classroom conditions and inferential results establishing the strength and direction of associations that served as the basis for the proposed instructional enhancement plan.

3 Results

The results showed that Grade 7 learners demonstrated a highly positive perception of MAPEH across all measured dimensions. The overall perception mean was high (approximately 3.85), indicating that students generally view MAPEH as an important, enjoyable, and meaningful subject. Among the three components, enjoyment had the highest mean (around 3.92), suggesting that learners particularly appreciate the interactive, activity-based nature of MAPEH lessons. Value and relevance also received high ratings, reflecting that students recognize the subject's contribution to their personal growth, health awareness, creativity, and daily life.

Learners' motivation toward MAPEH was likewise rated high, with an overall mean of about 3.82. This implies that students are consistently driven to participate in MAPEH activities and complete learning tasks. Notably, teacher encouragement emerged as the strongest motivational factor (with a mean of about 3.95), highlighting the crucial role of supportive teacher behavior in sustaining learner engagement. The findings suggest that beyond interest in the subject itself, students' willingness to exert effort is reinforced by teachers who provide guidance, affirmation, and meaningful feedback during performances, skill practice, and health-related learning tasks.

In terms of instructional practices, MAPEH teachers reported frequently employing a variety of learner-centered strategies, reflected in a high overall mean of roughly 3.81. The most used approaches included multimedia integration, demonstrations, group or collaborative activities, and performance-based tasks. These strategies align with the nature of MAPEH as a practical and skills-oriented subject, and they provide students with opportunities to learn actively, observe models, practice repeatedly, and express creativity in authentic contexts.

Correlation analysis revealed significant positive relationships among the major variables. Learners' perceptions were strongly and positively related to their motivation ($r \approx 0.684$, $p = 0.001$), indicating that students who perceive MAPEH as more valuable, enjoyable, and relevant are also more motivated to learn it. When examined along dimensions of value, enjoyment, and relevance, each showed significant correlations with motivation (r values ranging from 0.66 to 0.70), confirming that all aspects of perception contribute meaningfully to motivational outcomes.

Finally, the findings indicated that teachers' instructional strategies were significantly associated with both learners' perception and motivation. More engaging and varied strategies corresponded with higher learner ratings of enjoyment, value, and relevance, as well as stronger motivational levels. Taken together, these results suggest a reinforcing cycle in the MAPEH classroom: effective student-centered strategies promote positive perceptions, which in turn strengthen motivation, and motivated learners are more responsive to classroom activities. These empirical patterns served as the foundation for the proposed action plan to enhance MAPEH instruction for Grade 7 learners further.

4. Discussion

The findings of this study corroborate a large body of motivation research in physical education and allied MAPEH domains showing that positive learner perceptions are strongly tied to higher motivation and engagement. In the present results, Grade 7 learners rated MAPEH highly in value, enjoyment, and relevance, and these dimensions were significantly and positively related to motivation. This pattern aligns with Expectancy–Value Theory research, indicating that students participate more actively in physical education when they perceive activities as important, enjoyable, and useful for present and future life (Eccles & Wigfield, 2002). A meta-analysis of EVT studies in physical education likewise concluded that task value (interest/enjoyment and utility) is a consistent predictor of students' effort and engagement, strengthening the idea that perception and motivation operate together in PE-type learning areas such as MAPEH (Zhang & Chen, 2022).

The high motivation levels observed in this study—especially the prominence of teacher encouragement as a motivating factor—also echo Self-Determination Theory findings in PE contexts. SDT posits that motivation rises when teachers support autonomy, provide structure that builds competence, and foster relatedness (Deci & Ryan, 2000). Empirical PE studies show that adolescents who perceive stronger autonomy support and teacher involvement report greater psychological need satisfaction and more self-determined motivation (Taylor & Ntoumanis, 2007). Similarly, SDT-based work linking supportive teacher behavior to increased engagement and physical activity suggests that teacher encouragement functions as a practical expression of autonomy support and relatedness, reinforcing students' willingness to participate—consistent with the present study's results (Cheon et al., 2019).

The study's evidence that enjoyment was the highest-rated perception dimension mirrors related investigations showing that affective experiences in PE strongly influence continued participation. For example, research on middle school students found that perceived competence and enjoyment significantly predicted persistence and physical activity engagement, underscoring how pleasurable classroom experiences translate into stronger motivation and sustained involvement (Zhu et al., 2023). This supports the current conclusion that when Grade 7 learners enjoy MAPEH tasks—performances, arts production, games, or fitness routines—their motivational drive becomes more stable and classroom engagement improves.

The findings on teachers' instructional strategies further align with motivational-instruction literature, particularly ARCS-based and student-centered PE studies. In this study, teachers frequently used multimedia, demonstrations, collaborative activities, and performance tasks, and these strategies were significantly associated with higher learner perception and motivation. ARCS-focused PE intervention research likewise reports that lessons designed to capture attention, emphasize relevance, build confidence through guided practice, and provide satisfaction via meaningful performance opportunities lead to stronger motivation and improved participation (Keller, 1987; Tsai et al., 2022). The convergence suggests that varied, interactive, and contextually meaningful strategies are not just popular practices but demonstrably linked to learners' positive attitudes and motivation in movement- and performance-oriented subjects like MAPEH.

Overall, the present study strengthens and localizes international evidence: students' positive perceptions (value, enjoyment, relevance) are associated with higher motivation, and supportive, engaging instructional strategies are linked to both perception and motivation. By demonstrating these relationships among Grade 7 learners within a MAPEH setting, the research echoes SDT and EVT conclusions in PE while reinforcing ARCS-informed claims that motivation is teachable through deliberate instructional design. This corroboration provides strong theoretical and empirical justification for the study's proposed action plan, emphasizing real-life contextualization, technology-supported engagement, collaboration, and teacher professional development as routes to sustain learners' motivation and perceptions in MAPEH.

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DEVELOPMENT OF CARISSA CARANDAS JAM AND JUICE

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Abstract

The study focused on the Development of *Carissa Carandas* Jam and Juice and evaluating their sensory acceptability and financial viability. The overall sensory attributes of *Carissa carandas* jam and juice such as appearance, aroma, taste and texture received a favorable acceptability with a descriptive value of like very much in all treatments.

Findings of the study revealed a no significant difference in all the sensory attributes of both *Carissa carandas* jam and juice indicating consistent consumer satisfaction. Treatment 2(1500 grams of *Carissa carandas*), turned out as the best formulation for *Carissa carandas* jam while Treatment 3 (650 grams Carissa carandas) turned out as the best formulation for *Carissa carandas* juice. The microbiological test results of *Carissa carandas* jam such as aerobic plate count, mold count and yeast count were found within the allowable limits set by the FDA. The microbiological test results of *Carissa carandas* juice such as aerobic plate count, total coliform and Escherichia coli count, total mold and yeast count were also found within the allowable limits set by the FDA.

The *Carissa carandas* jam and juice production reveals the viability of both products. Recommendations include utilization of *Carissa carandas* jam and juice aside from the treatment currently employed, conduct of the same study in other location, standardization process of *Carissa carandas* jam and juice, proper hygiene of the production site to sustain zero microbial qualities, adopt the development *Carissa carandas* jam and juice as a source of income, utilize the learning material developed for instruction and further reference, conduct of nutritional analysis, farmers to venture into planting *Carissa carandas* and development of new food products aside from jam and juice.

Keywords: Carissa carandas, Jam, Juice, Sensory Acceptability, Microbiological Analysis

1. Introduction

Global food systems are currently challenged by population growth, climate change, food insecurity, and significant postharvest losses, particularly of fruits and vegetables. In response, researchers and policymakers have emphasized the need to diversify food sources by utilizing underexploited and neglected plant species with nutritional, functional, and economic potential (Chacha et al., 2022). Underutilized fruits are increasingly recognized as valuable resources for improving dietary diversity, enhancing nutrition, and promoting sustainable agriculture, especially in developing regions where conventional crops dominate food production systems.

One such underutilized fruit is *Carissa carandas* L., commonly known as karonda or Bengal currant. *Carissa carandas belongs* to the family Apocynaceae and is a perennial, thorny shrub widely distributed in tropical and subtropical regions of South and Southeast Asia. The plant thrives in semi-arid and marginal environments, requires minimal agricultural inputs, and exhibits strong resistance to drought and poor soil conditions (Mahajan et al., 2022). Despite these

agronomic advantages, its utilization remains largely limited to household-level consumption and ornamental purposes.

The fruit of *Carissa carandas* is small, oval to round, and undergoes a color change from green to pinkish red and dark purple as it ripens. It is characterized by a distinct sour-to-tart flavor, which limits its acceptability in its raw form but makes it suitable for processed products such as jams, juices, syrups, and preserves (Meena et al., 2020). Nutritionally, *Carissa carandas* is rich in dietary fiber, vitamin C, iron, calcium, and a wide range of phytochemicals, including phenolic acids, flavonoids, tannins, and anthocyanins (Bibha et al., 2024). These compounds exhibit antioxidant, antimicrobial, antidiabetic, anti-inflammatory, and anticancer activities, positioning the fruit as a promising ingredient for functional food development (Saher et al., 2019).

Despite its nutritional and therapeutic attributes, *Carissa carandas* remains underutilized due to several constraints. These include limited consumer awareness, a short harvesting period, high perishability, and inadequate postharvest handling and processing technologies (Mahajan et al., 2022). In many rural communities in the Philippines and other Asian countries, the fruit is grown primarily as an ornamental hedge plant, and ripe fruits are frequently discarded, resulting in food waste and lost economic opportunities. Addressing these challenges requires developing value-added processing strategies that improve shelf life, palatability, and marketability.

Processing fruits into jam and juice is among the most effective and widely adopted preservation techniques. These products rely on sugar concentration, acidity, and thermal processing to inhibit microbial growth, ensuring safety while retaining desirable sensory attributes. Several studies have demonstrated that *Carissa carandas* can be successfully incorporated into processed food products with acceptable sensory quality and storage stability (Laxmi et al., 2021; Dunghav & Hingane, 2022). However, formulation optimization is critical, as variations in fruit concentration can influence taste, aroma, texture, and overall acceptability.

Sensory evaluation plays a pivotal role in determining the success of newly developed food products. Consumer acceptance is largely driven by sensory characteristics, including appearance, aroma, taste, and texture, which strongly influence purchasing behavior and repeat consumption (Mamoona et al., 2023). The use of hedonic scales in sensory testing provides a systematic and reliable approach to assessing product acceptability and identifying preferred formulations. For underutilized fruits such as *Carissa carandas*, sensory evaluation is particularly important in overcoming consumer unfamiliarity and promoting market acceptance.

Food safety is another critical consideration in the development of fruit-based products. Microbiological analysis is essential to ensure that processed foods meet regulatory standards and do not pose health risks to consumers. Routine testing for aerobic plate count, mold and yeast, total coliforms, and pathogenic microorganisms such as *Escherichia coli*serves as a key indicator of product safety and hygienic processing conditions (Sornoza, 2024). Compliance with food safety standards not only protects public health but also enhances consumer confidence and supports product commercialization (ElexBio, n.d.).

Beyond nutritional quality and safety, the economic viability of food products determines their sustainability as livelihood and entrepreneurial ventures. Cost analysis and computation of return on expenditure (ROE) provide valuable insights into production efficiency, pricing strategies, and profitability. Previous studies have shown that value addition through processing of indigenous and underutilized fruits can generate meaningful income opportunities for farmers, small-scale processors, and community-based enterprises (Kamble et al., 2023). In regions where raw materials are locally abundant, developing low-cost, marketable food products contributes to rural development and poverty alleviation.

This study is grounded in experiential and empirical approaches to food product development, emphasizing systematic experimentation, observation, and evaluation. By integrating product formulation, sensory testing, microbiological assessment, and economic analysis, the research provides a comprehensive evaluation of *Carissa carandas* as a raw

material for jam and juice production. Moreover, the study aligns with global initiatives promoting sustainable food systems and the use of indigenous plant resources, including the United Nations Sustainable Development Goals on food security, nutrition, and sustainable agriculture.

Given the limited local studies that comprehensively assess the sensory, microbiological, and economic aspects of *Carissa carandas*-based food products, there remains a need for empirical evidence to support its broader utilization. Therefore, this study aimed to develop jam and juice from *Carissa carandas* and evaluate their sensory acceptability, microbiological quality, and economic viability. Specifically, it sought to determine the level of sensory acceptability across appearance, aroma, taste, and texture; identify the optimal formulation for each product; assess compliance with microbiological safety standards; and compute the return on investment. The findings of this study are expected to contribute to food innovation research, promote the use of underexploited fruits, and support sustainable livelihoods.

2. Method

2.1 Research Design

This study employed a descriptive–experimental research design focused on food product development and evaluation. The design integrated experimental formulation, sensory assessment, microbiological analysis, and economic evaluation to determine the feasibility of developing jam and juice from *Carissa carandas* fruit. This approach is appropriate for studies that aim to develop value-added food products while simultaneously assessing quality, safety, and economic performance.

The experimental phase involved preparing *Carissa carandas* jam and juice using four treatments per product, including a control. The treatments varied in the quantity of *Carissa carandas* fruit used, while other ingredients and processing conditions were kept constant to isolate the effect of fruit concentration on product quality. This controlled variation enabled objective comparisons among treatments and the identification of the most acceptable formulation.

Sensory evaluation followed a quasi-experimental design using a completely randomized design (CRD). Product samples were randomly presented to respondent-evaluators to minimize bias and order effects. Sensory acceptability was assessed using a 9-point Hedonic scale covering appearance, aroma, taste, and texture. Descriptive and inferential statistical analyses were employed to determine differences in sensory attributes among treatments.

Microbiological analysis constituted a confirmatory component of the design, conducted to evaluate product safety and compliance with food safety standards. Standard laboratory testing was performed to determine aerobic plate count, mold and yeast count, total coliforms, and *Escherichia coli*, providing objective indicators of hygienic processing and microbial stability.

An economic evaluation was incorporated through the computation of Return on Expenditure (ROE). Production costs, yield, pricing, gross income, and net income were analyzed to determine the financial viability of the developed products. Integrating economic analysis into the experimental design enabled a holistic assessment of the products' potential for small-scale commercialization and livelihood generation.

Overall, the descriptive–experimental design enabled a comprehensive evaluation of *Carissa carandas* jam and juice by linking formulation, consumer acceptability, food safety, and economic feasibility within a single methodological framework.

2.2 Participants

A total of thirty (30) respondent-evaluators participated in the sensory evaluation component of the study. The panel consisted of ten (10) teachers and twenty (20) students from Eastern Pangasinan Agricultural College (EPAC). The teacher-evaluators were faculty members

teaching Technical-Vocational Education (TVE) and Technical-Vocational-Livelihood (TVL) subjects, particularly Bread and Pastry Production (BPP), Cookery, and Food Processing. They were included to provide expert perspectives relevant to food preparation and product quality assessment. The student-evaluators were included to represent general consumers and provide preference-based evaluations of the developed products.

Participants were selected to capture both expert-informed assessments and consumer-oriented perceptions of the sensory attributes of *Carissa carandas* jam and juice. All participants served as sensory panelists to evaluate product samples across treatments using a standardized 9-point Hedonic scale.

The sensory evaluation was conducted at EPAC under controlled conditions, and panelists were instructed to rinse their mouths with water between sample evaluations to minimize carryover effects. Participation was voluntary, and responses were treated confidentially and used solely for academic and research purposes.

2.3 Instrumentation

Sensory acceptability of the developed *Carissa carandas* jam and juice was assessed using a structured sensory scorecard based on the 9-point Hedonic rating scale. The instrument measured four sensory attributes: appearance, aroma, taste, and texture. Each attribute was rated on a scale from 1 (extremely disliked) to 9 (extremely liked). The scorecard also provided space for panelists' optional comments and suggestions to capture qualitative feedback relevant to product improvement.

The same scorecard format and rating scheme were applied to all treatments for both products to ensure consistent and comparable responses. Panelists were instructed to rinse their mouths with water between samples to minimize sensory carryover and improve rating reliability.

The microbiological quality of the selected jam and juice samples was determined through laboratory analysis conducted at a regional standard and testing facility. Standard microbiological test procedures were used to generate quantitative results for aerobic plate count, mold and yeast count, total coliform count, and Escherichia coli count. These parameters served as objective indicators of hygienic processing, microbial stability, and product safety.

Economic viability was assessed using a costing and pricing worksheet developed for the study. The worksheet captured ingredient costs, packaging and overhead expenses, total yield, cost per unit, mark-up, selling price, gross income, net income, and Return on Expenditure (ROE). This instrument enabled standardized computation and comparison of financial outcomes for the best-performing jam and juice formulations.

2.4 Data Analysis

Data from the sensory evaluation, microbiological testing, and economic assessment were organized, processed, and analyzed using appropriate statistical and analytical methods aligned with the study's objectives.

Descriptive statistics, including mean, standard deviation, frequency, and percentage, were used to summarize the level of sensory acceptability of *Carissa carandas* jam and juice in terms of appearance, aroma, taste, and texture. Mean hedonic scores were interpreted using the corresponding qualitative descriptions of the 9-point Hedonic scale.

Inferential statistical analyses were conducted to determine whether significant differences existed among treatments. For sensory evaluation data, multivariate analysis using Wilks' Lambda was employed to examine the overall effect of treatments on combined sensory attributes. Tests of between-subjects effects were used to assess differences in individual sensory attributes across treatments. When applicable, pairwise comparisons with Bonferroni adjustment were performedto identify specific treatment differences. Statistical significance was set at $\alpha = 0.05$.

Results of microbiological analyses were interpreted descriptively by comparing laboratory findings with established food safety standards and allowable limits for jam and juice products. Compliance with microbiological criteria was used as an indicator of product safety and adequacy of hygienic processing practices.

Economic data were analyzed through cost–return analysis. Total production cost, yield, selling price, gross income, and net income were computed for each product. Return on Expenditure (ROE) was calculated by dividing net income by total production cost and expressing the result as a percentage. This analysis assessed the financial viability of producing *Carissa carandas* jam and juice.

All statistical analyses were conducted at a 95% confidence level, and results were presented in tables and interpreted in relation to the study objectives.

3 Results

The sensory acceptability scores for *Carissa carandas* jam and juice across treatments are summarized in Table 1. All treatments for both products obtained high mean hedonic scores, indicating favorable consumer acceptance.

For *Carissa carandas* jam, mean scores for appearance ranged from 8.37 to 8.50, aroma from 8.07 to 8.33, taste from 8.20 to 8.50, and texture from 8.20 to 8.43. All attributes across treatments were descriptively interpreted as “liked very much.” Treatment 2 recorded the highest overall mean sensory score among jam formulations.

For *Carissa carandas* juice, mean scores for appearance ranged from 8.33 to 8.57, aroma from 8.17 to 8.60, taste from 8.13 to 8.60, and texture from 8.23 to 8.50. Treatment 3 obtained the highest mean scores across all sensory attributes and was descriptively rated from “liked very much” to “extremely liked.” Overall, both products demonstrated high sensory acceptability across formulations.

Multivariate analysis using Wilks’ Lambda showed that the type of treatment had no statistically significant effect on the combined sensory attributes of *Carissa carandas* jam ($\Lambda = 0.929$, $p = 0.743$) or juice ($\Lambda = 0.905$, $p = 0.492$).

Tests of between-subjects effects further revealed no significant differences among treatments for individual sensory attributes. For jam, no significant differences were observed in appearance ($p = 0.921$), aroma ($p = 0.493$), taste ($p = 0.429$), or texture ($p = 0.420$). Similarly, for juice, differences among treatments were not statistically significant for appearance ($p = 0.519$), aroma ($p = 0.149$), taste ($p = 0.054$), or texture ($p = 0.601$).

Pairwise comparisons using Bonferroni adjustment indicated that none of the treatment pairs differed significantly ($p > 0.05$) for all sensory attributes in both jam and juice formulations. These results indicate that increasing the amount of *Carissa carandas* fruit did not result in statistically significant changes in sensory quality.

Although no statistically significant differences were detected among treatments, the best formulations were identified based on the highest overall mean sensory scores. For jam, Treatment 2 (1500 g *Carissa carandas***)** recorded the highest overall mean score and was selected as the preferred formulation. For juice, Treatment 3 (650 g *Carissa carandas***)** achieved the highest overall sensory acceptability and was identified as the best formulation.

Results of microbiological analyses for the selected jam and juice formulations are presented. For *Carissa carandas* jam, the aerobic plate count was less than 1.0 CFU/g, while mold and yeast counts were less than 10 CFU/g. These values were within the allowable limits for processed fruit products.

For *Carissa carandas* juice, aerobic plate count was less than 250 CFU/mL, total coliform count and *Escherichia coli*count were less than 3.0 MPN/mL, and mold and yeast counts were less than 10 CFU/mL. All microbiological parameters complied with established food safety standards, indicating that the products were microbiologically safe for consumption.

The economic analysis results are summarized in Tables 11 and 13. The total production cost of *Carissa carandas* jam was PHP 272.50, yielding ten 120 mL jars. The computed selling price per jar was PHP 34.06, resulting in a gross income of PHP 340.60 and a net income of PHP 68.10. The return on expenditure (ROE) for jam production was 24.99%**.**

For *Carissa carandas* juice, the total production cost was PHP 99.50, producing three 350 mL bottles. The selling price per bottle was PHP 41.46, resulting in gross income of PHP 124.38 and net income of PHP 24.88. The computed ROE for juice production was 25.01%**.**

4. Discussion

The consistently high hedonic ratings across all sensory attributes indicate that *Carissa carandas* is a viable raw material for developing fruit-based jam and juice products. This finding aligns with the literature, which describes karonda as a fruit with a substantial phytochemical and organic acid composition that can support desirable color intensity and flavor complexity when processed (Bibha et al., 2024). The observed acceptability also supports prior work showing that karonda can be transformed into palatable, consumer-acceptable processed products despite its naturally sour profile in fresh form (Meena et al., 2020).

In the present study, all treatments of jam were rated within the “liked very much” range, and juice treatments similarly demonstrated strong acceptability, with the highest mean scores observed in the most concentrated fruit formulation. These results parallel findings from value-added karonda products, in which sensory ratings remained generally favorable across formulations, supporting the concept that processing can moderate perceived sourness and improve overall product liking (Laxmi et al., 2021; Rafique et al., 2023). Moreover, studies on mixed or composite jams indicate that adjustments in fruit proportions do not necessarily produce drastic changes in hedonic outcomes, provided that sweetness, acidity, and texture remain within consumer-acceptable ranges (Ogori et al., 2021; Pushpendra et al., 2024).

From an applied product development perspective, the strong sensory results can also be interpreted through the lens of consumer perception research, indicating that color and appearance serve as high-impact cues in beverage and fruit product acceptance, influencing perceived quality and willingness to consume (Mamoona et al., 2023). Given the characteristic pigments of karonda (notably anthocyanins and related phenolics), the fruit’s natural coloration likely contributed to favorable appearance ratings in both jam and juice, especially at higher fruit concentrations (Bibha et al., 2024).

The absence of statistically significant differences among treatments suggests that the range of fruit concentrations used in the study produced products that were sensory comparable to those preferred by respondents. This pattern is consistent with the jam formulation literature, which indicates that moderate changes in fruit pulp proportion may not yield statistically distinct hedonic profiles, especially when sugar and processing steps are standardized (Ogori et al., 2021; Pushpendra et al., 2024). For practical adoption, this is advantageous: it allows small-scale processors to select formulations based on ingredient availability or cost constraints without substantially compromising consumer acceptability.

Additionally, the finding may reflect the balancing role of sugar addition and heat processing. In fruit preserves, sugar contributes not only sweetness but also mouthfeel, viscosity, and flavor masking of excessive acidity; these effects can reduce perceptible differences caused solely by varying fruit content. Evidence from karonda-based jam development indicates that acceptable sensory profiles can be achieved when formulation parameters (particularly soluble solids and acidity) are controlled (Laxmi et al., 2021; Rafique et al., 2023).

Although treatments were not statistically different, selecting a “best formulation” based on the highest mean overall acceptability is consistent with standard product development practice, especially in applied food innovation studies. The preferred jam formulation (Treatment 2) and the preferred juice formulation (Treatment 3) correspond to higher fruit quantities,

suggesting that increased fruit content may enhance overall sensory appeal, likely through stronger fruit flavor intensity and improved color saturation.

This trend is consistent with karonda-based product studies where increasing karonda proportion can improve sensory scores for attributes linked to fruit character (e.g., color, taste, mouthfeel), if sourness remains balanced (Pushpendra et al., 2024). Similarly, karonda jam research has shown that acceptable products can be achieved and optimized through iterative trials, with the best-performing formulation typically reflecting a balance of fruit solids, sweetness, and texture (Laxmi et al., 2021).

From a processing standpoint, identifying preferred formulations supports future standardization efforts. Standardization is particularly relevant for underutilized fruits due to variability in ripeness, acidity, and pigment concentration. Such variability can influence batch-to-batch consistency, and controlled formulation selection offers a practical pathway toward quality assurance and potential commercialization.

Microbiological test results indicated that both jam and juice samples were within acceptable limits for key indicators, including aerobic plate count, mold and yeast, and coliform-related measures. These findings support the conclusion that the applied processing steps (e.g., heating, pasteurization, hygienic handling, and sealed storage) were effective in reducing microbial risks.

The result aligns with established food microbiology principles: thermal processing combined with sugar concentration and acidity typically reduces water activity and creates an inhibitory environment for microbial proliferation in jams and similar preserves. Research on karonda jam and karonda squash likewise reports microbiological safety during storage when hygienic processing is implemented (Laxmi et al., 2021; Laxmi et al., 2022).

The broader literature emphasizes that microbiological testing is a core component of food safety and quality assurance, enabling detection of contamination and verification of sanitary practices (Sornoza, 2024). Industry guidance also underscores that routine microbiological analyses strengthen consumer trust and provide evidence of compliance readiness for small-scale product commercialization (ElexBio, n.d.). Notably, plant-derived bioactive compounds in karonda have been reported to possess antimicrobial potential, which may complement processing controls; however, such effects should be considered supportive rather than a substitute for good manufacturing practices (Bibha et al., 2024).

The ROE values for jam and juice (approximately 25% in both products) indicate that *Carissa carandas* processing can be financially viable at a small scale. This supports the broader argument that value addition can transform underutilized fruits from household waste into income-generating commodities. Such outcomes are consistent with research highlighting that underutilized plant resources can contribute to nutrition while also supporting local enterprise development when processing and marketability are addressed (Chacha et al., 2022; Kamble et al., 2023).

Economic feasibility is particularly relevant in contexts where *Carissa carandas* is locally available and often underused. When raw materials are accessible, and production inputs are limited to standard household or community-level equipment, the barrier to entry for microenterprise adoption is reduced. Additionally, comparable product development studies (including syrup and jam formulations from karonda) suggest that processed karonda products can be positioned as affordable functional foods with potential niche appeal due to distinctive flavor and perceived health value (Dunghav & Hingane, 2022).

Collectively, the sensory, microbiological, and economic results support the feasibility of developing *Carissa carandas*jam and juice as safe, acceptable, and market-viable products. The study adds applied evidence to existing research on karonda's nutritional and functional promise (Bibha et al., 2024; Saher et al., 2019) and reinforces the role of value-added processing as a strategy to reduce fruit waste and enhance community-level food utilization. The findings also

provide a practical basis for product standardization, food processing education and training activities, and small-scale entrepreneurship initiatives.

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UTILIZATION OF ONLINE LEARNING PLATFORMS AND TEACHING EFFECTIVENESS IN ARALING PANLIPUNAN 10: BASIS FOR AN ENHANCEMENT PROGRAM

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Abstract

This study examined the utilization of online learning platforms in teaching Araling Panlipunan 10 and determined its relationship with teaching effectiveness in a public secondary school context. Using a quantitative descriptive–correlational design, data were collected from Araling Panlipunan 10 teachers and Grade 10 learners using a researcher-developed questionnaire that assessed ICT utilization across four domains: lesson delivery, assessment and feedback, learner engagement, and communication/collaboration. Descriptive statistics were used to assess utilization and teaching effectiveness, and Pearson product–moment correlation was used to test the association between platform utilization and teaching effectiveness. Results revealed that online learning platforms were highly utilized overall (M = 3.69), with lesson delivery registering the highest utilization (M = 3.91), followed by assessment and feedback (M = 3.73). Communication and collaboration showed high utilization (M = 3.61), although peer interaction and peer feedback practices were comparatively weaker. Teaching effectiveness was rated highly effective overall (M = 3.69). Correlation analysis indicated a moderate positive and statistically significant relationship between platform utilization and teaching effectiveness ($r = 0.62$, $p < 0.05$), suggesting that greater utilization is associated with improved instructional effectiveness. Despite these positive outcomes, key challenges persisted, particularly unstable internet connectivity, limited student access to devices, and insufficient training on advanced platform features. The findings underscore the instructional value of online learning platforms in AP10 while highlighting the need for targeted interventions in infrastructure support, teacher capacity building, and engagement-focused digital pedagogy.

Keywords: Online Learning Platforms; ICT Utilization; Teaching Effectiveness; Araling Panlipunan 10; Digital Pedagogy; Secondary Education

1. Introduction

The rapid expansion of information and communication technologies (ICT) has substantially reconfigured the operational and pedagogical landscape of basic education. Across systems, digital tools are increasingly used to broaden access to learning resources, diversify instructional strategies, and streamline administrative functions. In developing contexts, however, the integration of ICT in classroom practice remains uneven, influenced by structural constraints such as connectivity, device access, and teacher capacity. UNESCO has consistently emphasized that ICT can expand access, bridge learning divides, and support the development of new pedagogies, but its benefits depend on sustained investment in professional development, infrastructure, and instructional design that is grounded in learners' needs (UNESCO, 2020). Within this global trajectory, the Philippine education system has likewise pushed forward technology-enabled teaching and learning as part of broader reforms in curriculum and teacher development.

In the Philippines, the Department of Education (DepEd) has institutionalized policies to improve instructional planning and teacher professional learning—two foundational conditions for effective technology integration. DepEd Order No. 42, s. 2016 highlights lesson planning as fundamental to ensuring quality teaching and learning and positions structured preparation (e.g.,

Daily Lesson Log or Detailed Lesson Plan) as a mechanism to strengthen instructional delivery and achievement of learning outcomes (Department of Education [DepEd], 2016a). Parallel to this, DepEd Order No. 35, s. 2016 formalizes Learning Action Cells (LACs) as a school-based continuing professional development strategy that supports collaborative teacher learning, reflective practice, and instructional improvement aligned with the K to 12 program (DepEd, 2016b). These policies implicitly acknowledge that meaningful pedagogical change—particularly in contexts undergoing rapid shifts such as digitalization—requires both systematic planning and sustained teacher support.

The urgency of digital learning adoption intensified during and after the COVID-19 pandemic, which accelerated the use of online platforms, learning management systems (LMS), and blended learning modalities. As schools transitioned between remote, blended, and face-to-face arrangements, teachers increasingly relied on digital tools to deliver lessons, manage submissions, administer assessments, provide feedback, and facilitate communication. However, evidence on the effectiveness of digital learning remains nuanced. A UNICEF evidence review notes that digital learning solutions can improve educational outcomes. Still, the magnitude and direction of effects vary widely and depend on implementation quality, learner context, and whether the intervention supports—not replaces—effective pedagogy (UNICEF, 2021). This variability underscores the need for context-specific studies that examine how and under what conditions digital tools contribute to teaching effectiveness and student learning.

Among widely adopted tools in basic education contexts is Google Classroom, a free and relatively accessible platform that supports assignment distribution, feedback mechanisms, resource sharing, and classroom communication. Its design aligns with workflow-oriented teaching needs—teachers can post materials, create and collect assignments, grade student work, and track progress. Empirical studies generally report that Google Classroom can improve organization, ease of access to materials, and teacher–student interaction when implemented within a coherent instructional structure. For example, research published in *Education and Information Technologies* reported positive perceptions of the learning environment associated with Google Classroom in teacher education settings. It highlighted its utility for communication and learning management (Sharma et al., 2020). Similarly, an effectiveness study comparing online learning platforms indicated that Google Classroom can support delivery processes, although its efficacy is shaped by user readiness and engagement patterns (Alsharif & Aldossary, 2022). These findings suggest that digital platforms can enhance instructional processes, but they do not eliminate the practical and pedagogical challenges that teachers face.

At the secondary level, these challenges can be particularly pronounced due to adolescent learners' developmental needs, subject-specific demands, and variability in home learning environments. While online platforms offer scalability and convenience, they can also exacerbate inequities when learners have limited access to devices or a stable internet connection. Moreover, sustained learner engagement in online or blended settings is not guaranteed. Studies of teacher perceptions often emphasize that although Google Classroom improves task management and content distribution, learner participation, motivation, and timely submission remain persistent concerns, especially in contexts where connectivity constraints or limited digital literacy affect student engagement (e.g., secondary teacher perception studies in Southeast Asia) (Mohd Shamsudin et al., 2021). As a result, assessing “effectiveness” requires moving beyond mere adoption or usage frequency and toward understanding whether the platform supports measurable dimensions of teaching quality and learning facilitation.

In this regard, teaching effectiveness is a multidimensional construct that typically includes lesson clarity, instructional delivery, assessment practices, feedback quality, classroom management, learner engagement, and responsiveness to student needs. Digital tools can strengthen each of these dimensions: they allow teachers to diversify materials (e.g., videos, simulations, infographics), personalize feedback, use formative quizzes, and establish

communication channels that extend learning beyond the classroom. However, such gains are conditional on teachers' ability to design instruction that aligns platform affordances with learning objectives, assessment standards, and the social dynamics of classroom learning. The DepEd's emphasis on lesson preparation (DepEd, 2016a) is therefore directly relevant: the integration of technology is most likely to yield instructional benefits when anchored in systematic instructional planning and curriculum alignment rather than treated as an add-on.

The subject area of Araling Panlipunan (AP)—particularly Grade 10—offers a critical context for examining the role of digital tools in teaching effectiveness. AP10 typically engages learners in analyzing civic issues, governance, historical and social processes, and economic and political structures. These competencies are inherently connected to inquiry, discussion, critical reading of sources, and perspective-taking. Digital platforms can support these competencies by enabling access to diverse resources, facilitating structured discussions, organizing inquiry-based tasks, and fostering collaborative learning. However, AP also requires carefully scaffolded facilitation to prevent superficial engagement, exposure to misinformation, or passive content consumption. In other words, the subject's learning goals can benefit from technology-mediated inquiry. However, the risks associated with unstructured digital engagement—such as distraction, uneven participation, and assessment authenticity—must be actively mitigated.

Globally, the increased reliance on digital devices in learning settings has also prompted debates on attention, screen use, and classroom discipline. For instance, a government-commissioned study in the Netherlands reported improved student concentration and learning environments following school smartphone restrictions, suggesting that device presence alone does not guarantee productive learning without appropriate policies and classroom management structures (Henley, 2025). While the Philippine context differs, the broader insight is relevant: digital learning benefits require intentional design and regulation of technology use, especially for adolescents. This strengthens the argument that understanding ICT utilization must include not only adoption levels but also the quality of pedagogical integration.

In the Philippine public-school setting, examining ICT utilization in AP10 is therefore timely and consequential. Despite institutional momentum toward digital transformation and professional development, many schools continue to face constraints, including intermittent internet access, limited devices, insufficient teacher training, and challenges with student engagement and assessment integrity in technology-mediated environments. UNICEF's evidence review emphasizes that digital learning interventions often yield the strongest results when they are aligned with curriculum, integrated into structured pedagogy, and supported by trained teachers and enabling infrastructure (UNICEF, 2021). UNESCO similarly highlights that ICT's promise is realized through new pedagogies and inclusive access strategies rather than technology deployment alone (UNESCO, 2020). In line with these perspectives, local investigations are required to assess how teachers and students are actually using ICT and whether greater use corresponds with stronger indicators of teaching effectiveness.

Accordingly, this study focuses on the utilization of ICT in the teaching of Araling Panlipunan 10 and its relationship to teaching effectiveness. The investigation is anchored in the practical realities of classroom implementation. It examines how ICT is used in critical domains such as lesson delivery, assessment and feedback, learner engagement, and communication or collaboration. By analyzing utilization levels and linking them to effectiveness indicators, the study contributes to evidence-based decision-making at the school level. It may inform professional development interventions aligned with DepEd policy directions. Furthermore, the study offers actionable insights for strengthening ICT integration in a subject area that plays a key role in civic competence development, thereby supporting both pedagogical improvement and broader educational goals.

2. Method

2.1 Research Design

This study employed a quantitative, descriptive–correlational research design to examine (i) the extent of ICT utilization in teaching Araling Panlipunan 10 and (ii) its relationship with teaching effectiveness. A descriptive approach was used to determine respondents' perceptions of ICT integration across key instructional domains (e.g., lesson delivery, assessment and feedback, learner engagement, and communication/collaboration). The correlational component was incorporated to test whether variation in ICT utilization is statistically associated with variation in teaching effectiveness, without manipulating the learning environment or imposing experimental controls.

The descriptive–correlational design is appropriate for studies that (a) aim to quantify prevailing practices or conditions in natural settings and (b) determine the strength and direction of relationships between measurable variables while maintaining ecological validity. In this study, the variables were operationalized through structured survey indicators and analyzed using inferential statistics to determine whether ICT utilization significantly predicts or aligns with observed levels of teaching effectiveness.

2.2 Participants

The participants in this study were Araling Panlipunan 10 teachers and Grade 10 learners from the study locale. Inclusion of both groups was intended to provide a more comprehensive assessment of ICT utilization and teaching effectiveness, since ICT integration in classroom instruction is shaped by both teacher implementation practices and student participation in technology-mediated learning tasks.

A purposive sampling technique was used to identify participants. This approach was considered appropriate because the study required respondents who were directly involved in the teaching–learning processes of Araling Panlipunan 10 and had practical experience with ICT-supported instruction during the study's reference period. Teachers included in the sample were those assigned to teach AP10 during the academic year of data collection. Student participants were drawn from Grade 10 classes in which ICT tools were used for instructional delivery, assessment, and communication.

2.3 Instrumentation

Data were collected using a researcher-developed, structured questionnaire designed to measure two core constructs: (i) ICT utilization in teaching Araling Panlipunan 10 and (ii) perceived teaching effectiveness. The instrument was developed to align with the study's objectives and organized into domain-based sections consistent with the expected instructional applications of ICT in secondary classrooms.

The questionnaire consisted of closed-ended items rated on a Likert-type scale, enabling the quantification of respondents' perceptions and facilitating descriptive and correlational statistical analysis. The format was selected to ensure uniformity of responses, minimize interpretation variability, and support the computation of weighted means, standard deviations, and correlation coefficients required by the study.

2.4 Data Analysis

Data were analyzed using descriptive and inferential statistical procedures consistent with the descriptive–correlational design of the study. Descriptive statistics were applied to determine the level of ICT utilization in teaching Araling Panlipunan 10 and the level of teaching effectiveness as perceived by respondents. Specifically, frequency counts and percentages were used to summarize categorical responses. At the same time, weighted mean and standard deviation were

computed to describe central tendency and variability across the questionnaire domains (lesson delivery, assessment and feedback, learner engagement, and communication/collaboration). Domain-level means and overall composite means were interpreted using established scale descriptors to classify utilization and effectiveness levels.

To examine the relationship between ICT utilization and teaching effectiveness, Pearson product–moment correlation (Pearson's *r*) was employed as the primary inferential test. This procedure determined the strength, direction, and statistical significance of the association between the two continuous composite variables at the appropriate alpha level. Correlation results were reported using the correlation coefficient (*r*) and the corresponding significance value (*p*), and findings were interpreted as evidence of association rather than a causal effect due to the non-experimental design.

3. Results

Results indicate that online learning platforms were highly utilized in teaching Araling Panlipunan 10, with an overall weighted mean of 3.69 (High Utilization). Across the four measured domains, Lesson Delivery obtained the highest utilization score (M = 3.91, HU), indicating that teachers consistently used platforms to upload AP10 materials, organize lessons by week or topic, integrate multimedia resources, and clarify lesson content. The summary further showed that Assessment and Feedback also registered high utilization (M = 3.73, HU), reflecting frequent use of digital tools for administering quizzes, collecting outputs, grading, and delivering feedback. Student Engagement yielded the lowest mean among the four domains (M = 3.51, HU). However, it was still interpreted as high utilization, suggesting that online discussions and interactive tasks were implemented but less consistently than content delivery and assessment.

For Communication and Collaboration, the computed mean was 3.61, which falls within the High Utilization range based on the study's scale descriptors. Domain indicators showed strong teacher-led communication practices, including posting announcements/reminders (WM = 3.95) and using chat tools for teacher–student communication (WM = 3.80). Collaboration-related practices were comparatively weaker: facilitating group tasks through shared tools was still high (WM = 3.50), but encouraging peer interaction and peer feedback was only moderately utilized (WM = 3.37, MU), indicating that student-to-student collaboration is less consistently promoted than teacher–student interaction.

Findings further showed that teaching Araling Panlipunan 10 using online learning platforms was highly effective, with an overall mean of 3.69 (Highly Effective). All effectiveness indicators were rated in the highly effective range, suggesting that platforms support clear lesson explanations, an organized lesson flow, enriched instruction through digital resources, and improved classroom communication. However, the results also showed that indicators related to sustaining participation and encouraging interaction were lower than other effectiveness indicators, suggesting that engagement remains a persistent constraint in digital instruction.

Correlation analysis demonstrated a moderate positive and statistically significant relationship between platform utilization and teaching effectiveness ($r = 0.62$, $p < 0.05$). This indicates that higher utilization of online platforms tends to be associated with higher perceived teaching effectiveness in Araling Panlipunan 10. The moderate magnitude of the association suggests that while platform use contributes meaningfully to instructional effectiveness, other contextual factors—such as access constraints, teacher training, and resource availability—may also influence effectiveness outcomes.

Despite high overall utilization and effectiveness ratings, teachers reported substantial barriers that limit optimal implementation. The most frequently reported challenge was unstable or slow internet connectivity (83.33%), followed by limited student access to devices (73.33%), underscoring the continuing influence of infrastructure and access inequities. Training and capability gaps were also prominent: insufficient training on advanced platform features

(66.67%) was reported as a major constraint. Pedagogical and workload-related concerns remained significant, including difficulty sustaining student participation online (60.00%) and time-consuming preparation of online materials (53.33%), implying that digital instruction requires additional monitoring and instructional labor. Further challenges included technical platform issues, difficulty verifying the authenticity of student outputs, limited AP10 digital materials, and inconsistent home learning support—factors that collectively constrain the depth and inclusiveness of technology integration.

Overall, the results confirm that online learning platforms are already embedded in AP10 instruction and are associated with improved teaching effectiveness. Still, limitations in access, training, engagement management, and assessment integrity remain critical areas for targeted intervention.

4. Discussion

The findings demonstrate that online learning platforms were widely used in teaching Araling Panlipunan 10, with the strongest use observed in lesson delivery and assessment/feedback. This pattern is consistent with how learning management platforms are typically adopted in school settings: teachers initially maximize tools that improve instructional organization, content distribution, and task management before fully optimizing higher-order functions such as peer collaboration and dialogic engagement. In this study, lesson delivery yielded the highest utilization rating, suggesting that platforms were effective at structuring lessons, uploading learning resources, and supporting the continuity of instruction. Such outcomes align with DepEd's policy emphasis on systematic lesson preparation as a core condition of teaching quality (Department of Education [DepEd], 2016a). When teachers use platforms to organize resources and sequence instructional activities, ICT integration becomes less of an "add-on" and more of a scaffold for lesson planning and delivery—an approach that increases instructional clarity and consistency. This supports broader guidance that ICT initiatives are most effective when embedded in curriculum and pedagogy rather than treated as purely technological deployments (UNICEF, 2021).

The high utilization of platforms for assessment and feedback suggests that teachers found ICT tools particularly useful for collecting outputs, administering quizzes, tracking submissions, and providing feedback efficiently. This is important because timely and actionable feedback is a recognized driver of learning gains, and digital environments can expand teachers' capacity to monitor performance. However, while assessment functions were used frequently, the study also raised concerns about the authenticity of student outputs and the difficulty of sustaining participation, indicating that digital assessment does not automatically guarantee validity or engagement. These observations reflect UNICEF's evidence that the effectiveness of digital learning depends heavily on the quality of instructional design and the implementation conditions, including learner support and the ability to mitigate integrity risks (UNICEF, 2021). In practical terms, these results suggest that schools benefit when digital assessment strategies are complemented with clear performance tasks, authentic assessments, and monitoring systems that are realistic for teachers, given workload constraints.

Teaching effectiveness was rated highly effective overall, indicating that online learning platforms can meaningfully enhance instructional quality in AP10. The association between high utilization and high effectiveness can be interpreted as evidence that ICT—when used for planning, delivery, assessment, and communication—enhances teachers' capacity to structure learning experiences and respond to student needs. This aligns with UNESCO's position that ICT can strengthen learning environments and institutional capacity when it is integrated into pedagogy and supported by teacher development (UNESCO, 2019/2020). Importantly, the study's results imply that effectiveness is not solely determined by platform availability; rather, it is achieved when teachers can translate platform features into coherent instructional practice.

This is consistent with the intent of DepEd's Learning Action Cell (LAC) policy, which formalizes collaborative professional learning as a mechanism for improving classroom practice (DepEd, 2016b). In this context, LACs may be leveraged as a structured vehicle for sharing strategies in AP10 digital pedagogy, designing interactive tasks, and strengthening assessment and feedback practices under blended or technology-supported arrangements.

The correlational findings further revealed a moderate, positive, and statistically significant relationship between platform utilization and teaching effectiveness. This suggests that increased use of online platforms tends to coincide with improved effectiveness ratings, reinforcing the argument that ICT utilization is a meaningful correlate of instructional quality in AP10. Nevertheless, the moderate strength of the relationship implies the presence of additional determinants of effectiveness beyond technology use. Such determinants likely include learner access to devices, internet stability, teacher competence with advanced platform features, and the degree of alignment between digital activities and AP10 learning competencies. UNICEF's guidance stresses that digital learning succeeds when it is designed to address clear learning needs and when teachers and students can realistically access and use the tools (UNICEF, 2021). Therefore, although ICT utilization contributes to teaching effectiveness, it may not fully compensate for systemic constraints that undermine consistent participation, equitable access, and authentic assessment.

The challenges reported by teachers—particularly unstable internet connectivity and limited student device access—are critical in interpreting both utilization and effectiveness outcomes. While teachers may be able to maintain high platform use in lesson delivery and assessment, unequal access can limit student engagement and create variability in learning outcomes. UNESCO emphasizes that ICT's promise in education depends on inclusive access strategies and capacity-building rather than on technology deployment alone (UNESCO, 2019/2020). This is consistent with the study's observation that engagement-related indicators were comparatively weaker: even when teachers deploy platforms effectively, learners' participation may remain constrained by connectivity limitations and home learning conditions. The reported insufficient training on advanced platform features also points to a professional development gap. This strengthens the policy relevance of DepEd's LAC framework, as teacher collaboration can help close skill gaps and promote consistent implementation practices (DepEd, 2016b). Overall, the discussion suggests that improvement efforts should target (i) infrastructure and access support, (ii) teacher training focused on engagement and collaboration design, and (iii) assessment integrity strategies that can be sustained in real classroom conditions.

In sum, the study provides evidence that online learning platforms are already embedded in AP10 instruction and are associated with high perceived teaching effectiveness. However, the results also show that technology-driven instruction remains bounded by access inequities, engagement challenges, and teacher readiness constraints. These findings reinforce the wider evidence base that digital learning interventions succeed when platforms are integrated into strong pedagogy, supported by teacher development mechanisms, and matched with realistic infrastructure and learner access conditions (DepEd, 2016a; UNESCO, 2019/2020; UNICEF, 2021). For AP10 specifically, strengthening collaboration and student interaction through structured inquiry tasks, discussion protocols, and scaffolded group work may address the weaker engagement and peer-collaboration components identified in the utilization results. Such targeted interventions can help ensure that ICT integration advances not only efficiency and organization but also deeper civic learning and critical thinking outcomes.

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CHALLENGES OF BALANCING ACADEMIC AND SPORTS COACHING RESPONSIBILITIES AMONG MUSIC, ARTS, PHYSICAL EDUCATION, AND HEALTH TEACHERS

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Abstract

MAPEH teachers in public secondary schools frequently assume dual responsibilities as classroom instructors and school sports coaches, creating competing professional demands that may intensify workload pressures and disrupt work–life balance. This study examined the challenges experienced by MAPEH teacher–coaches and compared their work–life balance outcomes with those of non-coaching MAPEH teachers. Using a quantitative, descriptive–comparative, and correlational design, data were collected from 500 MAPEH teachers using a structured survey questionnaire. Descriptive statistics were applied to identify the most salient challenge domains, while Pearson correlation was used to examine the relationship between weekly teaching hours and coaching hours. An independent-samples t-test was used to determine whether work–life balance differed significantly between the dual-role and non-coaching groups. Results indicated that workload (M = 4.08) and time management (M = 4.05) were the most prominent challenges among teacher–coaches, while perceived school support was comparatively lower (M = 3.02). Teacher–coaches reported comparable time commitments for teaching (22.58 hours/week) and coaching (21.23 hours/week). Correlation analysis showed no significant relationship between teaching and coaching hours ($r = +0.117$, $p = 0.215$), suggesting that coaching duties function as an additive workload rather than displacing instructional time. Work–life balance outcomes differed significantly between groups, with teacher–coaches reporting substantially poorer balance than non-coaching teachers ($t = -19.14$, $p < 0.001$). The findings demonstrate that the teacher–coach dual-role arrangement is associated with role overload and boundary erosion, highlighting the need for workload credit systems, scheduling protections, and institutional support mechanisms to sustain teacher well-being and instructional quality in MAPEH.

Keywords: MAPEH Teachers; Teacher–Coach Dual Role; Workload; Time Management; Work–Life Balance; Role Conflict

1. Introduction

In many public secondary schools, the responsibilities assigned to teachers extend well beyond classroom instruction. This is particularly evident for educators in Music, Arts, Physical Education, and Health (MAPEH), whose professional roles frequently include not only delivering a multidisciplinary academic curriculum but also managing school athletic programs as coaches. In practice, this creates an institutionalized “teacher–coach” dual-role arrangement where a single educator is expected to meet two distinct sets of performance standards: those of an academic teacher and those of a competitive sports coach. In the Philippine context, where extracurricular sports are often closely tied to school pride, public recognition, and community identity, the expectation that a MAPEH teacher will also serve as a coach is typically treated as a norm rather than an optional assignment. This structural reality places MAPEH teacher–coaches at the intersection of two demanding professional domains—formal teaching and athletic performance development—each requiring substantial time, cognitive effort, and emotional energy.

The teacher–coach dual role is not simply an issue of having more tasks. It is a fundamental professional tension rooted in incompatible expectations. Teaching requires

equitable attention to all learners, adherence to curriculum standards across multiple disciplines, and continuous assessment and instructional preparation. Coaching, by contrast, demands selective focus on student-athletes, extended practice sessions outside regular school hours, competition planning, travel commitments, and performance outcomes that are highly visible to school administrators and the local community. When these two streams of obligation collide—such as when practice schedules intrude into lesson preparation time or competitions overlap with instructional responsibilities—teachers experience role strain and psychological stress resulting from conflicting job demands. This condition reflects the essence of role conflict and role strain, which occur when individuals occupy multiple roles with competing expectations that cannot be simultaneously satisfied without compromise (EBSCO Research Starters, n.d.-a). In teacher–coach settings, conflict is often intensified because coaching success is evaluated publicly through wins and tournament outcomes. At the same time, classroom instructional quality is less immediately visible, thereby shifting incentives toward athletic performance. In some cases, this results in role retreatism, where the teacher–coach prioritizes coaching obligations because they are more externally rewarded or scrutinized.

Workload expansion is among the most measurable consequences of this dual-role model. Teacher–coaches frequently report extended workweeks that exceed conventional professional hours, driven by lesson planning, student assessment, practice sessions, game-day responsibilities, and athletic program administration. These extended work schedules lead to chronic fatigue and emotional exhaustion, particularly during peak sports seasons. Such workload conditions are widely identified in burnout research as key antecedents of emotional exhaustion and reduced professional well-being. A notable study on teacher burnout found that both teaching-related and non-teaching-related workload were significantly associated with emotional exhaustion, highlighting that excessive workload is not only a logistical burden but also a psychological risk factor (Van Droogenbroeck et al., 2014). For teacher–coaches, the workload issue becomes more complex because professional demands are not merely additive in terms of hours; they also require rapid role-switching between cognitive modes—e.g., shifting from designing academic assessments in the morning to strategizing for athletic competitions in the afternoon. This constant switching amplifies stress and contributes to cumulative depletion.

A second major concern is the erosion of work–life balance. In the teaching profession, work–life imbalance occurs when occupational responsibilities expand beyond the temporal and psychological boundaries that typically protect personal and family time. Work–life boundary theory explains that individuals manage the boundary between work and non-work domains through strategies ranging from integration (high permeability) to segmentation (strong separation). When boundaries become permeable—such as when evening practices, weekend competitions, and online communication extend work into personal time—work–life conflict increases, often leading to emotional distress and dissatisfaction. Contemporary boundary theory research emphasizes that how individuals enact boundaries substantially shapes their ability to maintain sustainable work routines, particularly in high-demand occupations (Desrochers & Morgan, 2021). In teacher–coach contexts, boundary permeability is structurally high because sports programs require after-hours engagement, making segmentation difficult without institutional support. This is consistent with the broader work–life boundary theory literature, which explains that employees frequently move between domains and that their well-being depends on how manageable and controllable those boundaries are (Clark, 2000).

Beyond the personal health implications, the dual-role model has potential consequences for educational quality. MAPEH is uniquely challenging because it includes four distinct academic components—Music, Arts, Physical Education, and Health—each requiring specialized content preparation and differentiated instructional design. When coaching schedules dominate an educator's available planning time, classroom instruction may become reactive or simplified, particularly in content-heavy areas such as music theory or health sciences. Prior research on

teacher–coach workload suggests that time scarcity can result in reduced lesson preparation quality and diminished instructional innovation. This is particularly problematic because MAPEH is intended to provide holistic development for all students, not only athletes. If teaching quality declines due to coaching demands, non-athlete learners may experience reduced access to engaging, well-prepared instruction, thereby raising equity concerns.

Institutional and community structures also play a significant role in sustaining the dual-role tension. Athletic success can function as a public-relations asset for schools, which may unintentionally create an incentive system that rewards coaching outcomes more strongly than instructional performance. When administrators provide unclear job descriptions, insufficient compensation, or limited logistical support for coaching responsibilities, the strain of managing both roles becomes more severe. The teacher–coach is therefore positioned within a broader organizational context where role conflict is not solely an individual problem; it is an outcome of how schools allocate labor, recognize workload, and structure expectations.

Despite the growing relevance of teacher–coach role conflict, much of the existing literature has historically concentrated on general Physical Education (PE) teachers or single-sport coaches, leaving a meaningful gap in the empirical understanding of MAPEH teachers who manage a multidisciplinary curriculum alongside competitive coaching duties. This gap is non-trivial because the MAPEH role is structurally more complex than PE-only assignments: it requires mastery across multiple learning areas while simultaneously performing coaching responsibilities that often resemble a second job. Without research specifically focused on MAPEH teacher–coaches, educational policymakers and school administrators lack the targeted evidence needed to create sustainable workload policies, time credit systems, and support programs.

To address this gap, the present study quantitatively examines the challenges, time allocation patterns, stress levels, and work–life balance of MAPEH teachers who hold dual academic and sports coaching responsibilities, compared with those without coaching duties. It further investigates whether teaching hours and coaching hours operate as compensatory commitments (one reducing the other) or as additive burdens that extend total work time. Anchored in role conflict theory and boundary theory, this study frames the teacher–coach experience as an interaction between incompatible role expectations and boundary permeability. In doing so, it extends prior research by centering the multidisciplinary MAPEH context and providing empirical data relevant to public secondary schools.

The significance of this research is both practical and policy-oriented. For education agencies and school administrators, identifying the primary drivers of strain—such as workload intensity and time-management constraints—supports evidence-based decision-making on staffing, compensation, and workload credit systems. For teachers, validating these challenges through quantitative data transforms anecdotal concerns into measurable evidence that can inform support interventions and institutional reform. Ultimately, ensuring that MAPEH teacher–coaches can maintain sustainable work patterns is critical not only for teacher well-being and retention but also for safeguarding instructional quality across all four MAPEH components and protecting the broader student population's access to holistic education.

2. Method

2.1 Research Design

This study employed a quantitative, descriptive–comparative and correlational research design to examine the challenges experienced by MAPEH teachers who concurrently serve as school sports coaches ("dual-role teacher–coaches") and to compare their work–life balance and stress indicators with those of MAPEH teachers who do not hold coaching responsibilities. The design was selected to achieve two primary objectives: (a) to describe the nature and intensity of challenges encountered by teacher–coaches across key domains (e.g., workload, time

management, role conflict), and (b) to test group differences and associations between role assignment, time allocation patterns, and well-being outcomes.

A comparative approach was applied by categorizing participants into two groups: (1) MAPEH teachers assigned as sports coaches and (2) MAPEH teachers without coaching roles. This grouping enabled statistical comparisons of work–life balance outcomes between the dual-role and non-coaching cohorts. In parallel, a correlational component assessed whether instructional workload and coaching workload function as independent (additive) commitments or whether time allocation to one role reduces time spent in the other. To support this objective, the study quantified weekly teaching and coaching hours and examined their statistical relationship, providing evidence about time distribution dynamics among dual-role personnel.

Data were collected through a structured survey instrument administered to MAPEH teachers across public secondary schools in the target region. Descriptive statistics were used to summarize respondent characteristics and challenge indicators. In contrast, inferential statistics were applied to evaluate hypothesized differences and associations between role assignment and key outcome variables. Collectively, this design enabled an evidence-based assessment of how dual-role assignment relates to workload pressure, role strain, and work–life balance among MAPEH teachers.

2.2 Participants

Participants consisted of 500 public secondary school MAPEH teachers drawn from selected schools in the study setting. Respondents were categorized into two groups based on role assignment: (1) MAPEH teachers with formal sports coaching responsibilities (dual-role teacher–coaches) and (2) MAPEH teachers without coaching assignments, who served as the comparison group. This grouping enabled direct assessment of differences in work-related challenges and work–life balance outcomes between dual-role and non-coaching teachers.

Eligible participants were required to be actively employed as MAPEH teachers during the data collection period and assigned to public secondary schools included in the sampling frame. Teacher–coaches were further defined as MAPEH teachers who coached at least one school sports team alongside their instructional responsibilities.

2.3 Instrumentation

Data were collected using a structured, self-administered survey questionnaire designed to measure the challenges and work–life balance conditions of MAPEH teachers, with particular emphasis on those holding dual teaching and coaching responsibilities. The instrument comprised sections capturing (a) respondent demographic and professional profile, (b) role-related challenges experienced as a teacher–coach, (c) workload and time allocation indicators for teaching and coaching tasks, and (d) perceived work–life balance outcomes.

Challenge indicators were measured using Likert-type items aligned with commonly reported teacher–coach constraints, including workload demands, time management pressures, and competing role expectations. Respondents reported time-use patterns by indicating the approximate number of weekly hours spent on instructional duties and coaching-related activities, supporting analysis of whether responsibilities were additive or compensatory. Work–life balance items assessed the extent to which professional duties interfered with rest, family time, and personal responsibilities, enabling comparative analysis between teacher–coaches and non-coaching teachers.

Prior to full administration, the questionnaire underwent content review to ensure that item coverage was appropriate to the teacher–coach context and consistent with the study objectives. Responses were treated as composite indicators for descriptive and inferential statistical analysis.

2.4 Data Analysis

Survey responses were encoded and analyzed using descriptive and inferential statistical techniques aligned with the study objectives. Descriptive statistics were computed to summarize participant characteristics, quantify the intensity of reported challenges, and describe weekly time allocation to instructional and coaching duties. Mean scores were interpreted using the study's established scale descriptors to determine the relative severity of challenge domains.

To examine the relationship between time spent on teaching and coaching responsibilities among dual-role respondents, a Pearson product–moment correlation was used. This analysis tested whether instructional hours and coaching hours were statistically associated, providing evidence on whether coaching obligations displaced teaching time or represented an additional workload.

Comparative analyses were conducted to determine whether work–life balance outcomes differed significantly between dual-role teacher–coaches and non-coaching MAPEH teachers. An independent samples t-test was used to assess mean differences between the two groups on work–life balance indicators, with statistical significance evaluated at the study's defined alpha level. All results were reported using appropriate test statistics and corresponding p-values to support interpretation and discussion.

3 Results

Overall, MAPEH teachers assigned as sports coaches reported substantial role-related challenges, with the highest levels concentrated in workload demands and time management constraints. Workload emerged as the most prominent challenge domain (overall $M = 4.08$), indicating that teacher–coaches consistently perceived their assigned tasks as heavy and difficult to manage alongside instructional responsibilities. Time management was similarly elevated ($M = 4.05$), reflecting persistent difficulty in balancing classroom obligations with coaching schedules and associated administrative tasks. In contrast, perceived school support was comparatively lower ($M = 3.02$), suggesting that institutional support was present but insufficient to offset workload and scheduling pressures. These findings indicate that the teacher–coach role is characterized primarily by time-intensive and operationally demanding responsibilities rather than by isolated issues of interpersonal or organizational support.

Time-use estimates show that coaching responsibilities constituted a meaningful extension of the professional workweek. Teacher–coaches reported an average of 22.58 hours/week dedicated to teaching duties and 21.23 hours/week devoted to coaching activities. This pattern demonstrates that coaching commitments are not minor or supplementary; instead, they represent a second substantial workload stream comparable in magnitude to instructional time. The near-equivalence of reported teaching and coaching hours provides descriptive evidence that dual-role assignment increases total weekly labor time rather than functioning as an integrated or time-neutral role arrangement.

Correlation analysis indicated that weekly hours devoted to teaching and coaching were not significantly related ($r = +0.117$, $p = 0.215$). This non-significant association suggests that increased coaching time did not correspond to reduced teaching time (or vice versa), implying that the two workload components operate largely independently. In practical terms, the findings support the interpretation that coaching responsibilities tend to be additive rather than compensatory, thereby increasing overall workload exposure for teacher–coaches.

Comparative analysis revealed a statistically significant difference in work–life balance outcomes between MAPEH teacher–coaches and non-coaching MAPEH teachers. The independent-samples t-test showed that teacher–coaches reported significantly poorer work–life balance than their non-coaching counterparts ($t = -19.14$, $p < 0.001$). This result indicates a strong relationship between dual-role assignment and reduced capacity to maintain personal and family time boundaries. Taken together with the workload and time-allocation findings, the group

difference suggests that the dual-role arrangement creates sustained work intensity that intrudes into non-work domains and contributes to imbalance.

4. Discussion

The present study provides empirical evidence that MAPEH teachers who concurrently serve as sports coaches experience a dual-role context characterized by high challenge intensity, extended worktime exposure, and significantly poorer work–life balance outcomes relative to non-coaching MAPEH teachers. Specifically, the results demonstrate that workload and time management are the most salient challenge domains for teacher–coaches, while perceived institutional support is comparatively less robust. These findings are consistent with role stress frameworks, which posit that conflicting and excessive role expectations increase strain when available resources (time, authority, support) are insufficient to satisfy competing demands (Kahn et al., 1964).

Workload emerged as the highest-rated challenge domain (M = 4.08), followed closely by time management (M = 4.05). In practical terms, these scores indicate that teacher–coaches experience their responsibilities not merely as busy schedules but as persistently heavy and challenging to coordinate. These results align with the teacher–coach literature, which frequently identifies time pressure and role overload as central stressors in dual-role occupational settings (Westmoreland, 2024). The high intensity of these pressures is also consistent with broader evidence linking excessive workload to emotional exhaustion and burnout among teachers, in which job demands accumulate beyond sustainable capacity (Van Droogenbroeck et al., 2014).

A key implication is that workload strain in this population is not simply attributable to “more hours,” but to the simultaneous requirement to deliver multi-disciplinary instruction across four learning areas while also meeting performance-based coaching expectations. This supports a role conflict interpretation in which teacher–coaches encounter incompatible demands that cannot be simultaneously optimized. In role theory terms, the dual-role arrangement exposes individuals to competing “role senders” and evaluation standards, increasing the probability of strain, dissatisfaction, and impaired performance (Kahn et al., 1964).

The time-use results show that teacher–coaches devote substantial weekly hours to both teaching (22.58 hours/week) and coaching (21.23 hours/week). Notably, correlation analysis found that teaching hours and coaching hours were not significantly associated ($r = +0.117$, $p = 0.215$). This non-significant relationship is consequential because it suggests that coaching time does not compensate for teaching time; instead, the coaching function operates as an additional workload stream.

This pattern reinforces an “additive burden” model: teacher–coaches are not reallocating time between roles to preserve total workload; instead, they are accumulating responsibilities. In role stress theory, such accumulation is characteristic of role overload, wherein an individual cannot reasonably meet all expectations given finite time and energy resources (Kahn et al., 1964). The finding also complements prior teacher–coach research indicating that time scarcity and overlapping deadlines (e.g., academic assessments, training schedules, competitions) frequently intensify stress and perceived inefficacy (Westmoreland, 2024).

From an organizational standpoint, these results imply that schools may be structurally relying on a “two jobs in one” arrangement without sufficient workload credit, staffing adjustments, or time allowances. This raises policy questions regarding whether coaching assignments should be treated as additional compensated roles or whether teaching loads should be formally reduced for designated coaches to prevent chronic overload.

The group-comparison results provide strong evidence that dual-role assignment has meaningful consequences for teachers’ lived experiences outside of work. Teacher–coaches reported significantly poorer work–life balance than non-coaching MAPEH teachers ($t = −19.14$,

$p < 0.001$). This result indicates that the dual-role structure is not merely professionally demanding—it meaningfully compromises the boundary between work and personal domains.

This finding is well explained through work/family border theory, which conceptualizes individuals as continuous "border crossers" navigating work and home domains that differ in norms, time structures, and behavioral expectations (Clark, 2000). Teacher–coaches face highly permeable work boundaries because coaching schedules routinely extend into evenings, weekends, and competition travel, making segmentation difficult and increasing spillover into family life. The significant imbalance observed in the present study is consistent with evidence that workload and reduced job flexibility drive work–life conflict and contribute to diminished well-being among teachers (Steiner et al., 2025). Importantly, the magnitude of difference between groups suggests that teacher–coaches may experience a qualitatively different work-life structure than teachers who remain within instructional duties alone. Whereas non-coaching teachers may experience overtime mainly during peak grading periods, teacher–coaches are likely to have recurring after-hours obligations tied to sports seasons and training continuity. This reinforces the need for institutional policies that recognize coaching as ongoing work-life integration, rather than a temporary or incidental assignment.

Although the study found that school support was rated lower ($M = 3.02$) than workload and time management challenges, this does not imply that support is absent; rather, it suggests that existing support is insufficient to mitigate the burden created by dual-role expectations meaningfully. In organizational stress terms, support functions as a resource that can buffer the adverse effects of high demands; when demands remain excessive, moderate support may have a limited protective impact (Kahn et al., 1964).

The teacher–coach literature emphasizes that leaders' clarity about role expectations, scheduling accommodations, and workload recognition can reduce conflict and enhance role sustainability (Westmoreland, 2024). Accordingly, the present findings suggest that school-based interventions should prioritize structural adjustments (e.g., reduced teaching loads, formal time credit, administrative assistance for athletic documentation, scheduling protections) rather than relying solely on individual coping strategies.

Taken together, the findings indicate that the teacher–coach model—at least as currently implemented—creates predictable conditions for role overload and boundary erosion. Schools and education agencies may therefore consider policy reforms that institutionalize workload recognition for coaching assignments, including (a) formal reduction of teaching loads during sports seasons, (b) compensation or time credits proportional to coaching hours, and (c) administrative support mechanisms to reduce non-instructional and non-coaching paperwork. Given that instructional quality depends on preparation time and cognitive bandwidth, reducing overload may also protect learning outcomes across all MAPEH components.

This study relied on self-reported survey measures, which may be affected by response bias or differences in personal stress thresholds. In addition, the cross-sectional design limits causal inference;. At the same time, dual-role assignment is strongly associated with poorer work–life balance; longitudinal research would better establish causal directionality across sports seasons and school terms. Future studies may also incorporate objective time-use tracking, qualitative interviews, or multi-site comparisons to identify which organizational models best support sustainable teacher–coach workloads. Finally, exploring differences across sports types, competition levels, and administrative support conditions may yield more tailored recommendations for workload policy.

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ENHANCING HOLISTIC DEVELOPMENT: THE EFFECTS OF MAPEH INTEGRATION ON JUNIOR HIGH SCHOOL LEARNERS

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Abstract

This study investigated the effects of integrating Music, Arts, Physical Education, and Health (MAPEH) on the holistic development of junior high school learners. Anchored on holistic education theory, Gardner's Multiple Intelligences, and Bloom's learning domains, the study posited that interdisciplinary and performance-based MAPEH experiences enhance cognitive, affective, and psychomotor competencies and translate into broader academic, socio-emotional, physical, and creative growth. A quasi-experimental one-group pretest–posttest design was employed among selected junior high school learners in Mangaldan National High School. Learners participated in integrated MAPEH lessons and activities that connected concepts and skills across the four components. Data were gathered using a validated Holistic Development Assessment Tool and analyzed through descriptive statistics and tests of significant mean differences at the .05 level. Results revealed significant improvements across all learning domains. Cognitive mean scores increased from 75.20 to 85.40, affective scores from 73.80 to 84.10, and psychomotor scores from 72.50 to 86.25. Holistic outcome indicators likewise rose, with academic development improving from 76.10 to 84.50, socio-emotional development from 74.30 to 85.20, physical development from 71.80 to 86.40, and creative development from 70.25 to 87.15; the largest gains were observed in creative and physical areas. These findings indicate that integrated MAPEH is an effective avenue for whole-child development in junior high school. The study recommends sustained interdisciplinary planning, teacher capacity-building, adequate resource support, and community partnerships to strengthen and institutionalize MAPEH integration.

Keywords: MAPEH Integration; Holistic Development; Junior High School Learners; Interdisciplinary Instruction; Performance-Based Learning; Cognitive-Affective-Psychomotor Domains.

1. Introduction

Holistic development has become a central goal of 21st-century basic education. Contemporary schooling is no longer expected to produce learners who are only academically competent; instead, it is tasked to cultivate well-rounded individuals who are intellectually capable, emotionally balanced, physically healthy, socially responsible, and creatively expressive. In the Philippine context, this orientation is embedded in the K to 12 reform. Republic Act (RA) 10533, or the Enhanced Basic Education Act of 2013, mandates a learner-centered and developmentally appropriate curriculum that supports the "complete, adequate, and integrated system of education" needed for holistic growth (Republic Act No. 10533, 2013). Complementing this, DepEd Order No. 8, s. 2015 emphasizes authentic and performance-based assessment to capture learners' real competencies, values, and skills across learning areas (Department of Education [DepEd], 2015). These policy directions highlight that the school curriculum must intentionally integrate experiences that address the cognitive, affective, psychomotor, and creative dimensions of learning, rather than treating them as separate or secondary outcomes.

One learning area designed to advance these outcomes is Music, Arts, Physical Education, and Health (MAPEH). MAPEH functions as an interdisciplinary platform where learners explore creativity through music and arts, wellness through health education, and physical competence through movement-based tasks. When taught as a coherent, connected learning experience, MAPEH can catalyze the development of multiple dimensions of the learner. The present study is grounded in the assumption that purposeful MAPEH integration directly shapes students' cognitive, affective, psychomotor, academic, socio-emotional, physical, and creative development by providing balanced learning experiences that engage the mind, body, emotions, and social interaction. Evidence from broader educational research supports this view. Integrative practices in physical education, for instance, have been shown to increase learners' motivation and engagement while strengthening learning in both movement-based and academic tasks, suggesting that PE-centered integration can promote whole-child outcomes (Goh et al., 2021). Likewise, holistic physical education models stress that coordinated physical, mental, emotional, and social learning opportunities help adolescents thrive in school and daily life (Griggs & Fleet, 2021). These findings align with the general claim that integrated MAPEH instruction can foster transferable life skills—such as teamwork, self-discipline, creativity, and health consciousness—alongside academic learning.

The theoretical foundations of this study further justify MAPEH integration as a holistic educational strategy. First, Gardner's Multiple Intelligences Theory posits that learners possess diverse intelligences—musical, bodily-kinesthetic, spatial, interpersonal, intrapersonal, among others—and that education should provide varied pathways for these intelligences to develop (Gardner, 1983). In MAPEH, musical and artistic activities stimulate musical and spatial intelligences, while physical education nurtures bodily-kinesthetic competence and social collaboration; health learning supports intrapersonal awareness and responsible decision-making. Second, the three-domain structure of Bloom's Taxonomy underscores that effective instruction must address cognitive (knowledge and thinking), affective (values and attitudes), and psychomotor (skills and movement) outcomes in an integrated way (Bloom et al., 1956; Krathwohl, 2002). MAPEH tasks naturally cut across these domains as learners analyze concepts, cultivate appreciation and values, and demonstrate skills through performance and movement. Third, Miller's Holistic Curriculum framework argues that fragmentation in schooling weakens learners' sense of connection; thus, the curriculum should link subject learning to community, mind-body integration, creativity, and meaning (Miller, 2019). From this perspective, MAPEH is not supplementary but a vital space where subject knowledge, personal wellness, social interaction, and artistic expression converge into connected learning experiences.

Despite these strong theoretical and policy bases, schools often implement MAPEH in a compartmentalized manner due to constraints on time, training, and resources, as well as varying pedagogical traditions. As a result, the potential of MAPEH to function as a unified, holistic domain is not always realized. This inconsistency is problematic because junior high school learners are at a developmental stage where integrated experiences are significant. Early adolescence is marked by rapid physical growth, identity formation, emotional volatility, and expanding social worlds; schooling that isolates learning into narrow academic tasks may fail to respond to these intersecting needs (Griggs & Fleet, 2021). In many Philippine junior high schools, MAPEH is still sometimes treated as a "minor" subject compared with other learning areas, which can limit investment in instruction, facilities, and formative assessment. Without empirical evidence localized in real school contexts, stakeholders may continue to undervalue MAPEH's contribution to holistic development.

To address this gap, the present study investigates the effects of integrated MAPEH instruction on the holistic development of junior high school learners at Mangaldan National High School. Specifically, it examines learners' development before and after exposure to integrated MAPEH lessons across three core learning domains—cognitive, affective, and psychomotor—

and explores broader outcomes, including academic performance, socio-emotional competence, physical wellbeing, and creativity. Using a pretest–posttest design, the study aims to generate evidence on whether integrated MAPEH produces significant developmental gains and to use these insights as a basis for an actionable program to strengthen MAPEH integration in junior high school settings. Ultimately, grounding MAPEH practice in empirical outcomes supports the larger K to 12 vision of producing Filipino youth who are not only knowledgeable but also healthy, socially engaged, and creatively equipped for lifelong learning and citizenship.

2. Method

2.1 Research Design

The study employed a quasi-experimental one-group pretest–posttest research design to determine the effects of integrated MAPEH instruction on junior high school learners' holistic development. A single cohort of selected learners participated in a structured set of interdisciplinary MAPEH lessons linking Music, Arts, Physical Education, and Health, after which the same group was assessed again using the Holistic Development Assessment Tool. Pretest scores established baseline levels in the cognitive, affective, and psychomotor domains, while posttest results captured changes following the integration intervention; the design therefore allowed direct comparison of learners' performance before and after exposure to integrated MAPEH activities. Descriptive statistics summarized domain and outcome levels, and inferential tests of mean differences at the .05 significance level evaluated whether observed gains were statistically significant, providing empirical evidence of the intervention's contribution to whole-child development.

2.2 Participants

The study consisted of two key groups from Mangaldan National High School: selected junior high school learners who served as the primary respondents, and MAPEH teachers who supported the implementation of the integrated instruction. The learner-participants were selected through stratified purposive sampling to ensure those included represented the target junior high school population and met the study's inclusion criteria. In contrast, all available and qualified MAPEH teachers in the school were included to ensure consistent delivery of the intervention and to reflect actual classroom conditions. This participant composition enabled the study to capture both learner outcomes across holistic domains and the instructional context through which MAPEH integration was carried out, thereby strengthening the ecological validity of the pretest–posttest comparisons.

2.3 Instrumentation

The study used a researcher-prepared, expert-validated Holistic Development Assessment Tool as its primary instrument for data collection, aligned with the objectives of integrated MAPEH instruction. This tool consisted of domain-specific measures that assessed learners' cognitive understanding of MAPEH concepts, affective outcomes such as attitudes, values, and socio-emotional responses, and psychomotor performance through skills-based tasks and rubrics in music, arts, physical education, and health. In addition, the instrument included indicators for broader holistic outcomes—academic, socio-emotional, physical, and creative development—captured through structured rating scales and performance-based criteria consistent with DepEd's classroom assessment policy. Prior to implementation, the tool underwent content validation by specialists and reliability testing (with internal consistency established through Cronbach's alpha), ensuring that it was both accurate and dependable for measuring pretest and posttest changes attributable to MAPEH integration.

2.4 Data Analysis

The study combined descriptive and inferential statistical procedures to determine the effect of integrated MAPEH instruction on learners' holistic development. First, weighted means and standard deviations were computed to summarize learners' pretest and posttest performance in the cognitive, affective, and psychomotor domains, as well as in the broader holistic outcome indicators (academic, socio-emotional, physical, and creative development). These descriptive results established baseline levels and the magnitude of change after the intervention. To test whether improvements were statistically meaningful, inferential analysis was conducted using tests of significant mean differences between paired pretest and posttest scores (consistent with a one-group pretest–posttest design), with the level of significance set at $\alpha = .05$. Where relationships among variables were examined, correlation analysis (e.g., Pearson r) was indicated to describe the strength and direction of associations. Together, these procedures provided an empirical basis for concluding whether integrated MAPEH produced significant gains across the targeted holistic domains.

3. Results

The results showed clear and consistent gains in learners' development after exposure to integrated MAPEH instruction. Across the three core learning domains measured in the pretest–posttest, post-intervention scores were higher than baseline levels, indicating that the integrated lessons supported meaningful learning improvements. The pattern of increases suggests that when Music, Arts, Physical Education, and Health are taught as connected, performance-based experiences, learners benefit not only in knowledge acquisition but also in the development of attitudes and skills, reflecting the intended whole-child orientation of the subject.

In the cognitive domain, learners' mean score improved from 75.20 in the pretest to 85.40 in the posttest, a gain of 10.20 points. This indicates a stronger conceptual understanding of MAPEH content when lessons were deliberately integrated across its components. The increase implies that interdisciplinary connections helped learners see relationships among ideas and apply concepts in more authentic tasks, rather than learning them in isolation. Such improvement also supports the view that arts- and movement-based learning can reinforce academic comprehension and retention.

Similarly, affective outcomes increased substantially, with mean scores rising from 73.80 to 84.10 (a gain of 10.30 points). This reflects growth in learners' motivation, appreciation, confidence, values, and socio-emotional engagement during integrated activities. The finding suggests that MAPEH integration created learning spaces where students could express themselves, collaborate, and build positive attitudes toward wellness and creativity. In effect, the subject became not just a venue for performance but a meaningful context for developing self-awareness and social connectedness.

The most considerable domain-level improvement occurred in psychomotor performance, where mean scores climbed from 72.50 to 86.25, yielding a 13.75-point increase. This indicates that integrated MAPEH notably strengthened movement, artistic, and skill-based competencies. The result makes sense given that integration emphasized hands-on, performance-oriented tasks that required learners to practice, refine, and demonstrate physical and expressive skills. It underscores the importance of providing structured opportunities for active learning, especially in junior high school where motor development and embodied learning are critical.

Beyond the three learning domains, broader indicators of holistic development also improved significantly after the intervention. Academic development increased from 76.10 to 84.50, socio-emotional development from 74.30 to 85.20, physical development from 71.80 to 86.40, and creative development from 70.25 to 87.15. Notably, the biggest gains were in creative (+16.90) and physical (+14.60) development, highlighting that integration most strongly enhanced learners' originality, artistic confidence, and fitness or bodily competence. Taken together, these

results confirm that integrated MAPEH is an effective approach for promoting whole-child growth, strengthening multiple learner capacities at once rather than privileging a single area of development.

4. Discussion

The findings of this study corroborate a growing body of evidence that integrated, performance-based learning in MAPEH-related fields yields gains across multiple domains of student development. The significant pretest–posttest increases in cognitive, affective, and psychomotor scores align with systematic research showing that integrative physical education and physically active learning strengthen not only skill performance but also academic-related understanding and engagement (Goh et al., 2020). Similarly, recent large-scale evidence on school-based physical activity indicates that structured PE and integrated activity-based lessons can improve academic achievement and learning readiness, supporting the cognitive gains observed in this study after MAPEH integration (Zhang et al., 2025).

The affective improvements and socio-emotional gains documented here are also consistent with the related literature, which emphasizes that arts- and movement-based integration fosters motivation, positive attitudes, and emotional intelligence. Reviews of arts integration interventions report reliable improvements in students' socio-emotional outcomes—such as self-confidence, classroom engagement, and positive dispositions toward learning—particularly when instruction is interdisciplinary and experiential (American Institutes for Research [AIR], 2022; Wallace Foundation, 2023). These patterns mirror the present study's notable posttest rise in the affective domain and socio-emotional development, suggesting that integrated MAPEH creates authentic contexts where learners internalize values, develop self-regulation, and strengthen peer relationships through collaborative performance tasks.

The strong psychomotor gains and large improvements in physical development further support scholarship arguing that holistic PE-centered curricula elevate motor competence, fitness, and embodied learning. Holistic physical education models emphasize that adolescent learners develop best when physical skills are taught alongside emotional and social meaning-making, rather than as isolated drills (Griggs & Fleet, 2021). Likewise, evidence-based guidance on integrating social and emotional learning (SEL) in PE shows that skill practice embedded in supportive, reflective environments increases persistence, teamwork, and self-management (New Mexico Public Education Department, 2024). The current study's outcomes reflect these principles, as learners' psychomotor improvements were paired with affective and socio-emotional growth, indicating that integration supported "whole-body" learning rather than purely physical proficiency.

The present study's marked gains in creativity and arts-related outcomes are also echoed in research on music and arts education. Meta-analytic and review studies report that sustained engagement in music and visual arts enhances executive function, critical thinking, creativity, and emotional processing—effects that can translate into improved general learning performance (Iosr Journals, 2024; Patel, 2014). At the applied classroom level, arts-integration research further demonstrates that when arts are woven into broader curricular experiences, students show stronger conceptual understanding and higher-level thinking, validating the cognitive and creative increases found in this MAPEH integration intervention (DeMoss & Morris, 2013).

Finally, Philippine-based and MAPEH-specific literature contextualizes these corroborations within local curriculum realities. Recent work on integrated MAPEH education describes the learning area as a key "cornerstone of holistic education" in the K to 12 system, intended to connect creativity, wellness, and physical literacy through interdisciplinary performance tasks (Ponsaran, 2024). Other local discussions similarly emphasize that MAPEH's value lies in cultivating balanced 21st-century learners, even as schools face implementation constraints (DepEd Bataan, 2025). The present study strengthens these claims by providing

empirical school-based evidence that integration is not merely a curricular ideal, but a measurable driver of holistic learner growth in junior high school.

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INTEGRATING DIGITAL STORYTELLING (DST) TO IMPROVE LANGUAGE SKILLS OF GRADE 7 LEARNERS IN FILIPINO

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Abstract

This study examined the effectiveness of integrating Digital Storytelling (DST) in improving the Filipino language skills of Grade 7 learners. The study was implemented at Mapita Integrated School, Aguilar District, Schools Division Office I Pangasinan, with 20 purposively selected students who initially demonstrated intermediate primarily proficiency. Using a quasi-experimental one-group pretest–posttest design, the learners first completed a teacher-made Filipino language proficiency test aligned with the Most Essential Learning Competencies. They then received lessons where DST materials—multimedia stories combining text, images, audio, and video—were systematically embedded into classroom instruction. After the intervention period, the same test was administered as a posttest. Descriptive statistics and a paired-samples t-test were used to determine changes in proficiency.

Results showed substantial gains after DST integration. The pretest mean score of 14.9 (SD = 2.73) increased to a posttest mean of 23.6 (SD = 1.88). Learner distribution shifted positively: advanced-level students increased from 5% to 15%, while beginner-level students decreased from 10% to 5%, indicating improved overall mastery and more consistent performance. The paired-samples t-test revealed a statistically significant difference between pretest and posttest scores ($t = 17.71$, $p < 0.0001$), leading to the rejection of the null hypothesis. The findings suggest that DST, grounded in constructivist and multimedia learning principles, is an effective strategy for developing listening, speaking, reading, and writing skills in Filipino. The study recommends sustained DST use, targeted teacher training in DST design, and further research with larger samples and extended implementation to examine retention and scalability.

Keywords: Digital Storytelling, Filipino Language Skills, Grade 7 Learners, Multimedia Instruction, Pretest–Posttest Design

1. Introduction

Language learning in the Filipino subject remains a persistent instructional priority in Philippine basic education, particularly at the junior high school level, where learners are expected to consolidate listening, speaking, reading, and writing competencies for academic success and civic participation. However, multiple local studies continue to report gaps in literacy performance among Grade 7 learners, including weaknesses in reading fluency, comprehension, and written expression in Filipino. For instance, nationwide and school-based assessments show that many early-to-junior high school learners fall below expected proficiency levels, especially in comprehension and meaning-making, even when word recognition is adequate (Tomas et al., 2021; Figuerres, 2025). Similar difficulties are noted in Filipino writing, where Grade 7 learners often struggle with basic conventions and coherent paragraph development, signaling the need for classroom innovations that are both skill-focused and motivating (Cabigao, 2021).

These learning challenges are especially significant under the Department of Education's MATATAG Agenda and decongested MATATAG Curriculum, which emphasize learning recovery, improved literacy outcomes, and contextualized teaching approaches for relevant, meaningful learning experiences (Department of Education [DepEd], 2023a, 2023b). Within this policy direction, Filipino teachers are encouraged to adopt pedagogies that engage digital-native

learners, support multimodal comprehension, and cultivate communicative competence. The classroom realities of limited engagement in traditional text-bound instruction, coupled with learners' increasing exposure to multimedia environments, suggest that teaching approaches aligned with contemporary literacies may better respond to current learner needs.

Digital Storytelling (DST) has emerged as one such approach. DST refers to the creation or use of short narratives presented through a combination of modes such as text, images, audio, and video, enabling learners to express meaning using digital tools while engaging in story-based learning (Robin, 2008; University of Liverpool, n.d.). In instructional settings, DST is not only a technological product but a structured learning process that involves researching ideas, scripting, organizing content, and presenting narratives to an audience. This process encourages learners to synthesize language with visuals and sound, thereby supporting integrated skill development and a deeper personal connection to content (Robin, 2008; Smeda et al., 2014). Recent syntheses and meta-analytic work reinforce DST's positive effects on language learning outcomes across both first- and second-language contexts, including gains in comprehension, vocabulary, oral fluency, and writing quality (Özdemir et al., 2025; Wu et al., 2020).

Foundational learning theories also support the pedagogical value of DST. Constructivist perspectives assert that learners develop knowledge more effectively when they actively construct meaning from authentic tasks and social interactions, rather than passively receiving information (Piaget, 1970; Vygotsky, 1978). DST aligns with constructivism by positioning learners as meaning-makers who interpret narratives, connect them to lived experience, and, when producing digital stories, negotiate meaning through planning, drafting, revising, and reflecting. In addition, DST reflects principles from the Cognitive Theory of Multimedia Learning (CTML), which argues that learners understand content more effectively when words and visuals are meaningfully combined, given humans' dual information-processing channels and limited working memory capacity (Mayer, 2009; Waxman, 2023). Properly designed DST materials can reduce extraneous cognitive load and enhance germane processing by presenting language input through coherent multimedia narratives that guide attention toward key meanings (Mayer, 2009). Effective DST integration, however, requires teachers to blend content, pedagogy, and technology deliberately. The Technological Pedagogical Content Knowledge (TPACK) framework highlights that successful educational technology use depends on the teacher's ability to align the "what" (content), "how" (pedagogy), and "with what" (technology) in response to contextual classroom needs (Mishra & Koehler, 2006; Koehler et al., 2013). DST serves as a concrete instructional vehicle through which TPACK can be operationalized in Filipino teaching: content is embedded in culturally resonant stories, pedagogy emphasizes language practice and reflection, and technology provides multimodal channels for engagement.

Despite growing evidence for DST, Philippine-based research on DST among Filipino subjects, especially in Grade 7 and in rural or small-school settings, remains limited. Existing local studies suggest that DST improves Filipino learning performance and engagement. However, many focus on larger urban schools or short-term applications, leaving questions about their effectiveness in smaller, context-specific classrooms (Abelon, 2023). Moreover, teachers need locally generated action research to validate whether DST meaningfully improves proficiency within their own learner profiles, resources, and curricular demands. This gap motivates the present study.

Accordingly, this study investigates the effectiveness of integrating Digital Storytelling to improve the Filipino language skills of Grade 7 learners at Mapita Integrated School. Specifically, it (a) describes learners' Filipino language proficiency before and after DST integration, and (b) tests whether a significant difference exists between pretest and posttest performance. By grounding the intervention in constructivism, CTML, and TPACK, the study aims to provide evidence-based guidance for Filipino teachers seeking practical literacy interventions aligned with MATATAG priorities.

The significance of this study is threefold. For learners, DST offers an engaging pathway to practice Filipino language skills in authentic, multimedia contexts. For teachers, the results can inform instructional planning and material development, particularly for differentiated support in mixed-proficiency classrooms. For school leaders and curriculum implementers, the research contributes localized evidence on technology-enabled literacy strategies that can be scaled or adapted within learning recovery initiatives. Ultimately, the study supports the broader goal of strengthening Filipino literacy and communicative competence among junior high school learners through innovative, context-sensitive pedagogy.

2. Method

2.1 Research Design

The study employed a quasi-experimental one-group pretest–posttest action research design to determine the effectiveness of integrating Digital Storytelling (DST) in improving Grade 7 learners' Filipino language skills. A single intact group of 20 purposively selected students from Mapita Integrated School was assessed using a teacher-made Filipino proficiency test aligned with the Most Essential Learning Competencies prior to the intervention (pretest). The DST-based lessons, which embedded multimedia stories combining text, visuals, audio, and video into regular Filipino instruction, were then implemented over the treatment period. After completion, the same instrument was re-administered as a posttest to measure learning gains. Pretest and posttest scores were analyzed using descriptive statistics (means, standard deviations, proficiency-level distributions) and an inferential paired-samples t-test to determine whether the observed improvement was statistically significant, thereby allowing the study to attribute the performance change to the DST integration within the classroom context.

2.2 Participants

The participants in the study were 20 Grade 7 learners from Mapita Integrated School in the Aguilar District, Schools Division Office I Pangasinan, who were selected through purposive sampling based on their enrollment in the Filipino class and suitability for the Digital Storytelling (DST) intervention. This intact group represented the typical language proficiency profile of the class at the start of the research, with most learners demonstrating intermediate-level Filipino skills during baseline assessment. The selection ensured that participants were directly exposed to the same instructional conditions, learning competencies, and assessment requirements, thereby allowing a valid within-group comparison of pretest and posttest performance and enabling the study to examine how DST integration influenced Filipino language development in authentic classroom settings.

2.3 Instrumentation

The study used a researcher-developed, teacher-made Filipino language proficiency test as the primary instrument, administered in pretest and posttest forms to measure learners' listening, speaking, reading, and writing skills before and after the Digital Storytelling (DST) intervention. The instrument was standardized for consistent administration and scoring, aligned with Grade 7 Filipino curriculum standards and the Most Essential Learning Competencies, and served as the quantitative basis for determining proficiency levels and learning gains attributable to DST integration in the classroom.

2.4 Data Analysis

This study followed a two-stage quantitative approach to determine whether Digital Storytelling (DST) produced measurable gains in Filipino language proficiency. First, descriptive statistics were computed to summarize and compare learners' pretest and posttest performance,

specifically using the mean and standard deviation to describe central tendency and score spread, and frequency distributions with percentages to show how many learners fell into the Beginner, Intermediate, and Advanced proficiency categories before and after the intervention. These descriptors established the baseline profile and documented shifts in achievement attributable to DST. Second, an inferential paired-samples t-test was applied to the matched pretest–posttest scores to test the null hypothesis and verify whether the observed improvement was statistically significant, thereby providing evidence that changes in proficiency were unlikely due to chance. Simple tables were also used to present results clearly and support direct comparison of pre-intervention and post-intervention outcomes.

3 Results

According to a July 2025 document, the results show that, before the Digital Storytelling (DST) intervention, learners' Filipino language proficiency was largely at a developing level. In the pretest, 17 out of 20 learners (85%) were classified as Intermediate, two learners (10%) as Beginner, and one learner (5%) as Advanced. The mean pretest score was 14.9 with a standard deviation of 2.73, indicating moderate proficiency with some variability across students. These baseline findings suggested that most learners had functional but not yet strong mastery of Filipino language skills and that a small subset required targeted support.

After DST was integrated into Filipino lessons, posttest outcomes reflected a clear upward shift in proficiency. The Intermediate group remained the majority at 16 learners (80%), but the number of Advanced learners increased to 3 (15%), showing that more students moved beyond the expected proficiency threshold. At the same time, the Beginner category decreased from 2 learners to 1 learner (5%), implying that even lower-achieving students benefited from the multimedia storytelling approach.

The improvement was also evident in overall performance metrics. Mean scores rose sharply from 14.9 in the pretest to 23.6 in the posttest, demonstrating substantial gains in Filipino language proficiency following DST exposure. In addition, score dispersion narrowed, as shown by the drop in standard deviation from 2.73 to 1.88. This reduction in variability indicates that DST not only raised achievement but also contributed to more consistent performance among learners, with fewer wide gaps between higher- and lower-performing students.

To test whether these gains were statistically meaningful, a paired-samples t-test compared matched pretest and posttest scores. The analysis produced a t-value of 17.71 with a p-value of < 0.0001, far below the 0.05 significance threshold. This result confirms that the observed improvement was highly significant and unlikely to be due to chance, leading to the rejection of the null hypothesis. Therefore, DST integration had a positive and statistically significant effect on Grade 7 learners' Filipino language proficiency.

Overall, the pattern of results provides converging evidence for DST effectiveness: proficiency levels improved, mean achievement increased markedly, the number of low-performing learners declined, and performance became more uniform across the class. Collectively, these outcomes demonstrate that DST served as a strong instructional intervention to enhance listening, speaking, reading, and writing skills in Filipino in this Grade 7 context.

4 Discussion

The findings of the present study corroborate a growing body of evidence that Digital Storytelling (DST) significantly enhances language proficiency through multimodal, narrative-based learning. The statistically significant gain in Filipino language performance after DST integration parallels broad conclusions from recent meta-analytic and systematic review literature, which report that DST produces positive effects across the four macro language skills in both native and second-language contexts (Gözüyeşil-Özdemir et al., 2025; Lim et al., 2022). In particular, these reviews highlight DST's capacity to strengthen comprehension and meaning-

making by combining verbal and visual channels, a pattern consistent with the current study's marked rise in mean scores and the upward movement of learners into higher proficiency bands.

At the national and classroom level, the results align with Philippine-based work, indicating DST's effectiveness in Filipino instruction. Abelon (2023), for example, documented improved Filipino learning outcomes among Grade 7 students exposed to DST compared with traditional methods, suggesting that narrative multimedia supports mastery of Filipino competencies in early secondary schooling. The present study reinforces this localized evidence, showing that even in a smaller rural-classroom context, DST yields meaningful proficiency gains and reduces the number of low-performing learners. Together, these studies suggest that DST is not only theoretically sound but also practically transferable across Philippine junior high school settings.

International quasi-experimental studies also mirror the achievement trajectory observed here. Research in secondary language classrooms consistently reports significant pretest–posttest gains following DST interventions, particularly in productive skills. For instance, quasi-experimental research on DST in EFL contexts shows that students using DST achieve better writing quality, fluency, and linguistic control than those using conventional storytelling (Barua, 2023; Nami, 2019). Similarly, studies focusing on DST and speaking competence find gains in oral fluency and confidence, attributable to repeated rehearsal, audience awareness, and multimodal planning embedded in the storytelling process (Yeh et al., 2021; Nguyen, 2023). The direction and magnitude of improvement in the current research fit this wider pattern, indicating that DST supports skill integration rather than isolated sub-skill growth.

Further corroboration is visible in DST studies centered on receptive skills. Action research on digital short stories demonstrates significant improvements in learners' listening comprehension, underscoring how audio-visual narratives scaffold attention, vocabulary acquisition, and inferencing (Fırat & Köksal, 2020). In the present study, posttest gains and reduced performance variability similarly suggest that DST's coherent multimodal inputs helped learners process Filipino texts more efficiently and consistently, including those who initially performed at the beginner level. This convergence strengthens the claim that DST is especially useful for classrooms oriented toward literacy recovery and comprehension development.

Overall, the study's outcomes affirm that DST is a robust, evidence-supported pedagogical strategy for language learning. Consistent with global syntheses and local Philippine trials, DST appears to raise achievement, increase the proportion of higher-proficiency learners, and narrow performance gaps (Gözüyeşil-Özdemir et al., 2025; Abelon, 2023; Lim et al., 2022). The corroboration across contexts implies that DST's instructional contribution lies in its simultaneous support for engagement, multimodal comprehension, and authentic language production—features directly aligned with current MATATAG learning-recovery priorities.

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INTEGRATION OF DIGITAL LEARNING TOOLS IN TEACHING GRADE SEVEN ARALING PANLIPUNAN

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Abstract

This study examined the extent to which digital learning tools are integrated in teaching Grade 7 Araling Panlipunan (AP) at Calasiao Comprehensive National High School (CCNHS) and determined whether teacher-related factors are associated with integration levels. Using a descriptive–correlational design, the study involved total enumeration of all Grade 7 AP teachers (n = 18). Data were collected through a researcher-developed survey questionnaire and complemented by semi-structured interviews to capture both quantifiable patterns of technology use and contextual explanations for observed practices. Quantitative data were analyzed using frequency and percentage distributions, weighted mean, and Spearman's rank-order correlation, while qualitative responses were subjected to thematic analysis. Results indicated a generally moderate-to-high level of integration with digital learning tools, with stronger integration in lesson delivery and content presentation than in domains requiring sustained learner interaction, enrichment, and remediation. Teachers reported using commonly accessible tools such as multimedia presentations, online learning resources, and digital assessment platforms, reflecting practical instructional needs and available resources. Correlational findings further suggested that integration levels varied across respondents and tended to increase with greater exposure to capacity-building activities and relevant training. Interview data supported these results by identifying recurring enabling factors (e.g., availability of ready-made digital materials and perceived usefulness for engagement) and persistent constraints (e.g., unstable internet connectivity, limited learner devices, and time demands in designing interactive digital tasks). The study concludes that while digital learning tools are increasingly embedded in Grade 7 AP instruction at CCNHS, deep and equitable integration remains constrained by infrastructure and implementation conditions. Findings informed the development of a context-responsive Digital Learning Integration Action Plan to strengthen consistency, instructional alignment, and sustainability of technology-supported AP teaching.

Keywords: Digital Learning Tools; Technology Integration; Araling Panlipunan; Grade 7; Descriptive–Correlational; Teacher Capacity-Building; Secondary Education

1. Introduction

Digital technologies are increasingly embedded in basic education as education systems adopt policies and invest in modernizing teaching and learning while expanding access to quality resources. Across countries, the use of information and communication technologies (ICT) in schools is now frequently positioned as a key driver of education transformation, encompassing curriculum delivery, teacher professional development, and system management. UNESCO (2023) notes that many systems are pursuing broad digital education strategies, but also cautions that technology adoption is highly uneven across contexts and that outcomes are not automatic. In the Global Education Monitoring (GEM) Report on technology in education, UNESCO emphasizes that decisions on education technology should be guided by relevance, equity, scalability, and sustainability, and that careful evaluation is needed to avoid widening existing learning gaps (UNESCO, 2023). This framing highlights why localized, school-based evidence

remains essential: policy direction and platform availability do not necessarily translate into consistent classroom integration.

The ongoing digital transformation of schooling is also shaped by rapid developments in digital platforms, connectivity, and educational applications used in instruction and school operations. The OECD underscores that digital transformation affects how schools are resourced and how teaching is organized, including the availability and use of digital resources for learning (Organisation for Economic Co-operation and Development [OECD], 2023). At the classroom level, digital learning tools may include presentation software, multimedia resources, interactive maps, simulations, collaborative platforms, and online assessment tools. When aligned with instructional purposes, such tools can enhance content delivery and learner engagement by providing multiple representations of concepts and enabling more flexible pedagogical approaches. The World Bank frames education technology (EdTech) as encompassing hardware, software, digital content, and data systems that can enrich teaching and learning when deployed to solve clearly identified educational problems (World Bank, n.d.). This perspective reinforces that technology integration is not an end in itself, but a means to improve instructional quality and learner outcomes.

Beyond supporting instruction, digital tools increasingly shape assessment and feedback practices. Digital platforms can enable more frequent formative checking, immediate feedback, and data-informed instructional decisions. The World Bank highlights that education systems are expanding the use of technology-supported assessment and learning analytics to inform instruction and personalize learning experiences (World Bank, 2022). In classroom practice, this may take the form of online quizzes, automated item feedback, digital submission of outputs, and organized tracking of learner progress. When used strategically, these tools can shorten feedback cycles and support timely instructional adjustments, particularly in foundational grade levels where misconceptions can accumulate if not addressed early.

Digital learning tools also strengthen learner engagement by promoting participation, collaboration, and active knowledge construction. The OECD's analysis of digital resource use indicates that outcomes depend not only on whether digital resources are available, but on how teachers and learners use them for learning activities; the report shows substantial variation in patterns of use within and across contexts (OECD, 2023). This finding is critical for school-based research because it suggests that documenting actual classroom practices is necessary to understand whether technology integration remains limited to teacher-centered delivery or extends to more interactive, inquiry-oriented tasks.

These issues are particularly relevant in Araling Panlipunan (AP), a learning area that requires learners to interpret relationships among people, places, time, and systems using evidence and contextual reasoning. The K to 12 Araling Panlipunan Curriculum Guide emphasizes the development of competencies expected of a "functionally literate and developed Filipino," including communication, analysis, and civic competence (Department of Education, 2019). Digital tools can help operationalize these goals by supporting access to authentic sources, enabling visualization of spatial and temporal patterns, and facilitating inquiry routines that require evidence-based explanation. For example, interactive maps and geospatial tools may help Grade 7 learners visualize geographic features, migration routes, trade networks, and territorial changes more effectively than static materials. Similarly, digital timelines and curated multimedia resources can support chronological reasoning and historical understanding by providing multiple entry points for comprehension.

AP instruction is also uniquely positioned to benefit from digital integration because the subject's themes—governance, rights, community issues, and civic responsibilities—are strongly connected to current events and the information environments learners navigate daily. UNESCO's media and information literacy guidance emphasizes competencies such as accessing information effectively, evaluating credibility, and using information ethically—capabilities aligned

with AP learning tasks that require learners to analyze sources, judge claims, and make informed civic decisions (UNESCO, 2022). In this sense, digital learning tools are not merely delivery supports; they can become vehicles for strengthening information literacy and civic reasoning when learning activities require learners to verify sources, synthesize evidence, and justify conclusions.

In the Philippine public secondary school context, the integration of digital technologies is increasingly visible in day-to-day instruction, particularly through expanded access to digital learning resources alongside printed and other modalities. DepEd has supported learning resources through repositories such as the DepEd Learning Portal and related tools for locating learning materials (Department of Education, n.d.). During and after pandemic-related shifts in learning delivery, schools and teachers have increasingly relied on accessible, familiar digital tools—such as presentation platforms, educational videos, and online quizzes—to sustain lesson continuity and support learner engagement. However, implementation often reflects uneven realities across schools, shaped by differences in infrastructure, internet reliability, device availability, and learner readiness. UNESCO's case study on education technology in the Philippines highlights how infrastructure, ICT capability, and enabling policies intersect with school-level conditions and resource gaps, influencing the consistency with which technology is adopted and utilized in teaching and learning (UNESCO, 2023).

These national-level realities underscore the need for classroom-level evidence. While policy texts and system initiatives promote technology integration, available information often remains at the macro level, focusing on platform availability or national intentions rather than on how integration unfolds within specific subjects, grade levels, and school contexts. Research and sector analyses consistently point to recurring constraints—intermittent connectivity, limited access to devices, teacher training needs, time constraints for preparing digital materials, and varying learner digital readiness—that shape classroom practice. Yet these constraints must be described and validated within local contexts if interventions are to be actionable and equitable.

For Calasiao Comprehensive National High School (CCNHS), these broader realities provide a context for understanding how Grade 7 AP teachers integrate digital learning tools in practice. The local school setting operates within DepEd's broader resource ecosystem while managing on-the-ground constraints and opportunities. In such a context, teachers may use a practical mix of digital presentations and videos for instruction, online quizzes for formative assessment, and collaborative platforms for learner outputs when connectivity allows. However, without systematic documentation, it remains unclear how frequently teachers integrate these tools, which instructional domains they support (planning, delivery, learning activities, assessment/feedback, enrichment/remediation), and whether tool use extends beyond basic presentation toward more learner-centered inquiry and collaboration. This is a critical gap because "availability" of tools does not necessarily equate to "instructional integration" of tools; moreover, superficial integration can limit the potential contribution of technology to deeper learning outcomes.

The absence of school-based evidence has practical consequences. If the gap remains unaddressed, digital tool integration in Grade 7 AP may remain inconsistent and teacher-dependent, resulting in uneven learning experiences across classes. UNESCO's GEM Report cautions that technology use must be evaluated on the basis of relevance, equity, scalability, and sustainability, because adoption that is not guided by evidence can lead to fragmented or low-impact practices and may exacerbate inequities (UNESCO, 2023). From an equity perspective, inconsistent integration may also widen opportunity gaps if learners' access to devices and connectivity differs, limiting participation in digital learning tasks outside the classroom. Additionally, without targeted support, teachers may default to a presentation-focused approach rather than leveraging tools to support inquiry, collaboration, and formative feedback cycles that strengthen AP competencies.

In response to these concerns, this study focuses on determining the extent to which digital learning tools are integrated into Grade 7 Araling Panlipunan instruction at Calasiao Comprehensive National High School and on generating school-based evidence to guide instructional improvement. Anchored on the AP curriculum's emphasis on 21st-century competencies and meaningful learning experiences (Department of Education, 2019), the study examines integration across key instructional processes: lesson planning, lesson delivery, learning activities and collaboration, assessment and feedback, and enrichment and remediation. It also identifies the most commonly used tools and their instructional purposes, and it examines enabling and constraining factors such as connectivity, device availability, teacher capacity, time for preparation, and learner readiness. By documenting these classroom-level realities, the study responds to international guidance that emphasizes evidence-based and context-responsive approaches to EdTech implementation (UNESCO, 2023; World Bank, 2022).

Ultimately, the value of the study lies in producing actionable findings for teachers and school leaders. Rather than assuming that technology integration is occurring because tools exist or policies encourage use, the study provides a grounded description of actual practice in Grade 7 AP classrooms at CCNHS. The findings are expected to inform a Digital Learning Integration Action Plan tailored to the school context, specifying priority tools, capacity-building activities, implementation steps, and monitoring indicators that strengthen consistency, instructional alignment, and equity in digital tool use. In doing so, the research aims to support the sustained and purposeful integration of digital learning tools to improve teaching quality, enhance learner engagement, and develop critical competencies in Araling Panlipunan.

2. Method

2.1 Research Design

This study employed a descriptive–correlational research design to determine the extent to which digital learning tools are integrated in teaching Grade 7 Araling Panlipunan (AP) at Calasiao Comprehensive National High School (CCNHS) and to examine the relationship between selected teacher-related factors and the degree of integration. The descriptive component was used to generate a systematic profile of respondents and to quantify the level of digital tool integration across key instructional domains, including lesson preparation, instructional delivery, learning activities, assessment and feedback, and enrichment or remediation. The correlational component was used to assess whether variations in integration levels were statistically associated with teacher characteristics, including age, years of teaching experience, educational attainment, and relevant training exposure. This design was selected because it enables the study to describe prevailing conditions while also testing the presence and direction of relationships among variables without manipulating the teaching environment, making it appropriate for a natural school setting where instructional practices are observed as they occur.

2.2 Participants

The study consisted of all Araling Panlipunan (AP) teachers handling Grade 7 classes at Calasiao Comprehensive National High School (CCNHS) during the research. A total enumeration sampling approach was employed to ensure comprehensive representation of the target population and to capture the full range of digital learning tool integration practices within the Grade 7 AP teaching group. In total, eighteen (18) teachers participated in the study, representing the complete set of AP teachers assigned to Grade 7 classes in the school. This sampling strategy was selected to strengthen the reliability of school-level conclusions by minimizing selection bias and ensuring that findings reflected the actual conditions and instructional practices of the entire Grade 7 AP teaching cohort in the locale.

2.3 Instrumentation

Data were collected using a researcher-developed survey questionnaire and a semi-structured interview guide, designed to capture both the measurable extent of digital learning tool integration and the contextual factors influencing its use in Grade 7 Araling Panlipunan at Calasiao Comprehensive National High School (CCNHS). The survey instrument consisted of two major parts: the first gathered respondents' profile variables (e.g., age, years of teaching experience, educational attainment, and relevant trainings), while the second measured the extent of integration of digital learning tools across key instructional domains, including lesson planning and preparation, instructional delivery, learning activities, assessment and feedback, and enrichment or remediation. Responses were recorded on a Likert-type scale to quantify integration levels and facilitate statistical analysis. To complement the survey data, semi-structured interviews were conducted to elicit deeper explanations of teachers' experiences, the tools they commonly use, and the enabling or constraining conditions (e.g., connectivity, device availability, and competence with digital platforms). The combined use of quantitative and qualitative instruments strengthened the study's methodological rigor by enabling triangulation and providing both breadth and depth in describing digital learning tool integration practices within the target teaching cohort.

2.4 Data Analysis

Quantitative data from the survey questionnaire were coded, tabulated, and analyzed using descriptive and inferential statistical procedures aligned with the study objectives. Respondents' profile variables were summarized using frequency counts and percentages to describe the demographic and professional characteristics of the Grade 7 Araling Panlipunan teachers. The extent of digital learning tool integration across instructional domains was examined by computing weighted means, supported by standard interpretation schemes to determine overall and domain-specific integration levels. To test the relationship between teacher-related variables and the extent of integration, the study employed Spearman's rank-order correlation (Spearman rho), which was appropriate given the ordinal nature of Likert-scale data and the study's interest in identifying the strength and direction of associations without assuming normal distribution. Qualitative data from semi-structured interviews were analyzed using thematic analysis, wherein responses were transcribed, coded, and grouped into recurring categories and themes that explained patterns of tool use, perceived benefits, and implementation constraints. Integrating quantitative outputs with qualitative themes allowed the analysis to provide a more comprehensive interpretation of digital learning tool integration practices and the contextual conditions shaping their use in Grade 7 AP classrooms.

3. Results

Findings indicated that Grade 7 Araling Panlipunan (AP) teachers at Calasiao Comprehensive National High School (CCNHS) demonstrated an overall moderate to high level of integration of digital learning tools, with variations observed across instructional domains. The integration was most evident in lesson delivery and content presentation, where teachers frequently used digital resources to support explanations and enhance learner engagement, while comparatively lower—but still functional—levels of integration were observed in domains requiring sustained interactivity such as collaborative learning activities, enrichment, and remediation. The results further showed that teachers relied on a set of commonly accessible tools (e.g., presentation and multimedia platforms, online quizzes, and basic productivity applications), reflecting both instructional practicality and the constraints of connectivity and device availability in the school setting. Correlational analysis suggested that the extent of digital learning tool integration was not uniform across respondents and was associated with selected teacher-related factors, particularly those related to professional exposure and capacity-

building (e.g., relevant trainings), indicating that integration strengthened as teachers gained more opportunities to develop digital competence. Qualitative responses supported the quantitative trends by identifying recurring enabling conditions (e.g., ease of use and availability of ready-made materials) and persistent constraints (e.g., unstable internet access, limited learner devices, and time demands in preparing digital activities), which collectively shaped the consistency and depth of classroom-level technology use.

4. Discussion

The findings indicate that Grade 7 Araling Panlipunan (AP) teachers at Calasiao Comprehensive National High School (CCNHS) were able to integrate digital learning tools to a moderate-to-high extent, with stronger use concentrated in lesson delivery and content presentation and comparatively more limited integration in learning activities requiring sustained interaction, enrichment, and remediation. This pattern aligns with international evidence that technology adoption in schools often begins with tools that support teacher-led instruction (e.g., slides, videos, and basic multimedia) because these are easier to implement under constraints of time, infrastructure, and learner device availability. The 2023 UNESCO Global Education Monitoring (GEM) Report emphasizes that technology is not inherently transformative; rather, its learning value depends on how purposefully it is selected, embedded, and supported within teaching practices, and it warns that systems frequently overestimate impact when technology use remains superficial or uneven (UNESCO, 2023). From this perspective, the study's observed variability across instructional domains suggests that while teachers have begun normalizing digital tools in classroom routines, integration may still be transitioning from "enhanced delivery" toward deeper pedagogical use—particularly where AP learning tasks demand inquiry, analysis of sources, and collaborative production of evidence-based outputs.

The results also suggest that teacher capacity-building is a meaningful lever for improving the quality and consistency of digital integration. Where integration levels were associated with professional exposure such as training, the implication is consistent with the World Bank's EdTech guidance that effective technology use depends heavily on teacher readiness and on implementation strategies that prioritize clear pedagogical purpose and practical support ("ask why," "act at scale, for all," and related principles) rather than focusing primarily on tools themselves (World Bank, 2022). In settings like CCNHS, where connectivity and device limitations persist, professional development becomes even more central, as teachers need strategies for low-bandwidth or offline work, appropriate task design, and equitable participation mechanisms. OECD analysis further notes that variation in access and use of digital teaching and learning resources is significant and that digital transformation outcomes depend on the coherence of the broader ecosystem—resources, infrastructure, governance, and teacher digital competence (OECD, 2023). Accordingly, the study's identification of enabling and constraining factors provides a plausible explanation for why lesson delivery demonstrated stronger digital integration than enrichment or remediation, which typically requires additional time, individualized feedback cycles, and consistent access to devices beyond class periods.

From a curriculum and learning standpoint, the implications are particularly important for AP, as the subject targets competencies in contextual analysis, critical reasoning, and civic literacy. DepEd's AP curriculum guide explicitly frames learning outcomes to develop 21st-century competencies and produce a functionally literate Filipino capable of informed participation in society (Department of Education, 2019). Digital tools can support these outcomes not only by enhancing the presentation of content but also by enabling inquiry activities—such as analyzing primary and secondary sources, using interactive maps, building timelines, and engaging in structured discussions based on evidence. However, the study suggests that this fuller potential may be constrained by structural barriers (connectivity and device access) and operational barriers (time for preparation and familiarity with platforms). The UNESCO GEM Report highlights

that technology must be deployed on terms that advance equity, including ensuring that adoption does not intensify opportunity gaps between learners who have devices and stable connectivity and those who do not (UNESCO, 2023). Therefore, the study's emphasis on documenting real integration practices supports an evidence-based approach to designing interventions that are both pedagogically meaningful and feasible for the local context.

Overall, the findings reinforce a central implication: digital learning tool integration at CCNHS is present and functional, but its depth is constrained by resource limitations and teacher capacity, resulting in uneven integration across instructional processes. To advance from presentation-focused integration toward more student-centered learning experiences, the school-level action plan should prioritize: (a) capacity-building that targets AP-specific pedagogical applications of digital tools, (b) structured sharing of teacher-developed digital resources to reduce preparation burden, (c) low-tech and offline equivalents for inquiry and formative assessment tasks, and (d) monitoring indicators that assess not only frequency of tool use but also quality of integration (e.g., learner participation, evidence-based tasks, and feedback timeliness). This approach is consistent with UNESCO's and the World Bank's guidance that education technology should be guided by educational purpose, equity, and sustainability, with classroom-level evidence informing implementation decisions (UNESCO, 2023; World Bank, 2022).

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IMPLEMENTATION OF INCLUSIVE PHYSICAL EDUCATION IN PUBLIC SCHOOLS: A TEACHER PERCEPTIONS AND CHALLENGES

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Abstract

This study examined the implementation of Inclusive Physical Education (IPE) in Philippine public schools, focusing on teachers' perceptions, challenges, and perceived effectiveness. Anchored on Ajzen's Theory of Planned Behavior, it employed a quantitative descriptive–correlational design. A validated, researcher-developed questionnaire was administered to public school physical education teachers. The survey measured perceived benefits and feasibility of IPE, and the severity of challenges in resource availability, specialized training, class management, and administrative support. Results showed that teachers strongly recognized the benefits of IPE for learners with and without disabilities, especially in promoting participation, social interaction, and equitable learning experiences. Feasibility was rated moderate, indicating uncertainty about schools' readiness to sustain inclusive practices. Challenges were perceived as moderate to high, with inadequate adaptive equipment and facilities and limited professional development emerging as the most severe barriers, followed by difficulties coordinating diverse learners in large classes and inconsistent administrative backing. Perceived effectiveness of IPE implementation was moderate and was positively associated with perceived benefits and feasibility, but negatively associated with challenge severity. The findings suggest that positive teacher attitudes must be matched by concrete supports for IPE to succeed. The study recommends sustained capacity-building for PE teachers, dedicated budgeting and procurement of adaptive resources, stronger leadership and monitoring at the school and division levels, and policy reforms to address class size and support services. Future studies may include classroom observations and learner outcomes to triangulate survey results. These results provide an empirical basis for DepEd and school heads to design context-responsive programs that sustainably expand inclusive participation nationwide.

Keywords: Inclusive Physical Education, Teachers' Perceptions, Implementation Challenges, Feasibility, Theory Of Planned Behavior, Philippine Public Schools

1. Introduction

Inclusive education has become a central direction of global and national schooling, grounded in the principle that all learners—regardless of disability, gender, background, or ability—should participate meaningfully in shared learning spaces. Internationally, inclusive education is closely linked to Sustainable Development Goal 4, which calls for equitable, quality education and lifelong learning opportunities for all (Office of the United Nations High Commissioner for Human Rights [OHCHR], 2020). In the Philippines, inclusion is not only a global aspiration but also a legal mandate. Republic Act (RA) 7277, or the Magna Carta for Persons with Disability (as amended by RA 9442), affirms the right of persons with disabilities to equal educational opportunities and obliges the State to ensure their integration into mainstream education whenever appropriate (Republic Act No. 7277, 1992; Republic Act No. 9442, 2006). Consistent with this, the Department of Education (DepEd) has institutionalized an Inclusive Education Policy Framework and related guidelines that require schools to identify, support, and accommodate learners with disabilities within general basic education settings (DepEd, 2022).

Physical Education (PE) is a crucial, yet often underexamined, component of inclusive schooling. UNESCO's International Charter of Physical Education, Physical Activity and Sport recognizes participation in quality and inclusive PE as a fundamental right, emphasizing that no learner should be excluded from physical activity due to disability or other forms of difference (UNESCO, 2015/2021). Likewise, the UNESCO Quality Physical Education (QPE) framework stresses that PE must provide equitable opportunities for all students to build physical literacy, social-emotional skills, and lifelong engagement in movement (UNESCO, n.d.). In inclusive settings, PE can uniquely promote peer interaction, confidence, and a sense of belonging, while also contributing to physical health and functional development. However, achieving these outcomes depends greatly on whether PE teachers are prepared to address learner diversity and can access the supports needed for inclusive practice.

Research across contexts suggests that teachers generally endorse the *idea* of inclusive PE, yet their confidence to implement it varies sharply depending on perceived supports and barriers. A recent mixed-methods systematic review found that PE teachers' attitudes toward inclusion are "largely favorable," but become less positive when disabilities are more severe or when teachers feel underprepared (Tarantino et al., 2022). Teachers frequently cite limited training in adapted or inclusive PE, insufficient equipment, large class sizes, and unclear administrative backing as persistent obstacles (Tarantino et al., 2022). Earlier scholarship similarly emphasizes that inclusive PE requires more than goodwill; it calls for intentional curriculum adaptation, collaborative support, and a school culture that treats diversity as a learning asset rather than a complication (Webb & Pope, 1999). These patterns matter for systems like the Philippines, where public schools routinely face shortages in facilities and instructional resources, and where many PE teachers have had minimal pre-service exposure to disability-specific pedagogy.

Understanding teachers' perceptions is especially important because teacher beliefs shape actual classroom decisions. Ajzen's (1991) Theory of Planned Behavior (TPB) provides a useful lens for examining inclusive PE implementation, proposing that behavior is predicted by (a) attitudes toward the behavior, (b) subjective norms or perceived social expectations, and (c) perceived behavioral control reflecting resources and self-efficacy. In inclusive PE, teachers who believe inclusion benefits all learners (positive attitude), feel supported by colleagues and school leaders (subjective norms), and perceive themselves as capable and resourced (behavioral control) are more likely to implement inclusive strategies consistently. TPB has been widely used in inclusion research because it explains how positive intentions can still fail to translate into practice when perceived control—such as training, equipment, or time—is weak (Ajzen, 1991; Tarantino et al., 2022).

Despite policy commitments, Philippine evidence on inclusive PE remains limited and fragmented. Much local research on inclusion focuses broadly on classroom accommodations or special education programs, leaving PE-specific realities underdocumented. However, PE poses distinctive instructional challenges: movement tasks must be adapted in real time, safety risks must be managed for heterogeneous ability levels, and participation is highly visible—meaning exclusion can occur subtly through activity design, peer dynamics, or assessment practices. When inclusive PE is poorly supported, learners with disabilities may experience token participation, reduced skill development, or social isolation. Conversely, when teachers are empowered, inclusive PE can become one of the strongest arenas for actualizing school-wide inclusion by making cooperation, empathy, and differentiated success visible to all students. The gap in PE-focused inclusion data, therefore, constrains DepEd divisions and school leaders' ability to plan training, allocate budgets, and evaluate program outcomes in ways that are responsive to PE teachers' lived conditions.

This study addresses that gap by examining the implementation of Inclusive Physical Education in Philippine public schools through the perspectives of PE teachers. Specifically, it

investigates teachers' perceived benefits and feasibility of inclusive PE, the severity of challenges they encounter regarding resources, specialized training, class management, and administrative support, and their perceived effectiveness of current IPE implementation. It further explores the strategies teachers employ to achieve inclusion in practice and uses empirical findings to develop policy recommendations aligned with national inclusion mandates. Grounded in TPB, this study assumes that teachers' attitudes and perceived feasibility (attitudinal beliefs) and the severity of challenges (behavioral control constraints) are associated with their overall judgments of implementation effectiveness. By mapping these relationships, the research aims to identify leverage points for improving inclusive PE at the classroom, school, and system levels.

Overall, the study contributes to inclusive education scholarship in three ways. First, it provides PE-specific evidence on inclusion within a developing-country public school context. Second, it clarifies which challenges most strongly undermine teachers' sense of effectiveness, offering a priority map for interventions. Third, it produces policy-relevant recommendations for DepEd and school leaders to strengthen inclusive PE through capacity building, resource provision, and institutional support. In doing so, the study supports the broader national goal of ensuring that inclusive education is not only legislated, but fully realized in everyday learning experiences—including in the gymnasium, on the field, and in every space where movement and participation can belong to all.

2. Method

2.1 Research Design

The study employed a quantitative descriptive–correlational research design to examine how public-school Physical Education teachers perceive and implement Inclusive Physical Education (IPE). A descriptive approach was used to summarize teachers' perceived benefits and feasibility of IPE, the severity of challenges across resources, specialized training, class management, and administrative support, and their perceived effectiveness of IPE implementation, primarily through weighted means and standard deviations. The correlational component determined the strength and direction of relationships between key variables—specifically, whether teachers' perceptions of benefits and feasibility were associated with higher perceived effectiveness, and whether greater challenge severity was linked to lower effectiveness—using appropriate statistical tests such as Pearson product–moment correlation and regression analysis. This design was appropriate because it enabled the study to capture the status of IPE implementation in public schools and to identify meaningful statistical associations among perceptions, barriers, and effectiveness, thereby informing evidence-based policy and program recommendations.

2.2 Participants

The participants of the study were public-school Physical Education (PE) teachers drawn from selected Philippine public schools, as they are the primary implementers of Inclusive Physical Education (IPE) in everyday classroom and activity settings. Using a defined sampling procedure (with sample size computed through a standard formula such as Slovin's and participants selected based on availability within the study locale), the respondents included teachers currently handling PE classes at the basic education level and who had direct experience teaching learners with diverse abilities, including learners with disabilities. This participant group was appropriate because their perceptions, experiences, and instructional practices provide the most immediate and practical evidence about the benefits, feasibility, challenges, and effectiveness of IPE implementation in real public-school contexts, making their responses essential for generating grounded conclusions and policy recommendations.

2.3 Instrumentation

The study used a researcher-developed, structured questionnaire as the primary data-collection instrument to assess the implementation of Inclusive Physical Education (IPE) in Philippine public schools. The instrument was organized into clear sections aligned with the statement of the problem: (a) teachers' perceptions of IPE benefits, (b) perceived feasibility of implementation, (c) severity of challenges across resource availability, specialized training/professional development, class management, and administrative support, (d) perceived effectiveness of current IPE practices, and (e) strategies or best practices used by teachers. Items were rated using a Likert-type scale to quantify levels of agreement or severity, enabling computation of weighted means, standard deviations, and correlational statistics. Prior to full administration, the questionnaire underwent content validation by experts in Physical Education and inclusive teaching, followed by pilot testing to establish clarity and internal consistency, with reliability verified through an acceptable Cronbach's alpha. This instrument was appropriate because it systematically captured both attitudinal and contextual variables needed to describe and statistically relate teachers' perceptions, barriers, and implementation outcomes.

2.4 Data Analysis

Data analysis was conducted using appropriate descriptive and inferential statistical procedures to address each research question on the implementation of Inclusive Physical Education (IPE). After coding and tabulating questionnaire responses, descriptive statistics—frequency counts, percentages, weighted means, and standard deviations—were computed to summarize teachers' perceived benefits, feasibility, challenge severity across the four domains, perceived effectiveness, and commonly used strategies. Mean scores were interpreted using predetermined Likert-scale intervals to determine the level of agreement or severity. For the inferential component, Pearson product–moment correlation was applied to test the relationships between teachers' perceptions (benefits and feasibility) and perceived effectiveness, as well as between challenge severity and effectiveness; where applicable, regression analysis was used to identify which variables significantly predicted implementation effectiveness. These analyses provided both a clear profile of current IPE conditions in public schools and empirical evidence of how perceptions and barriers are statistically linked to effectiveness, forming the basis for conclusions and policy recommendations.

3 Results

The results indicate that public-school PE teachers hold clearly positive attitudes toward Inclusive Physical Education (IPE), but concerns about its practical implementation temper this positivity. On the perceptions scale, teachers agreed that IPE is beneficial, rating its overall benefits sub-mean at 4.23 (Agree). The strongest endorsed benefit was that inclusive PE "promotes equality" (WM = 4.30, Strongly Agree), followed by enhancing social skills (WM = 4.22) and improving motivation (WM = 4.18). In contrast, feasibility received a much lower sub-mean of 3.14 (Neutral). Teachers were particularly unsure whether IPE is manageable in large classes (WM = 3.05), practical with current resources (WM = 3.12), and supported by training (WM = 3.25). This pattern shows a "benefit–feasibility gap": teachers believe inclusion is pedagogically and ethically valuable, yet they are uncertain that schools are ready to sustain it under present conditions.

Regarding barriers, teachers rated overall challenges as very challenging (WM = 4.05), suggesting that structural constraints remain severe and persistent. The most critical obstacle was resource availability—adaptive equipment and accessible facilities—rated very challenging (WM = 4.40). Specialized training and professional development were closely followed (WM = 4.25, Very Challenging), suggesting that many teachers feel they lack the technical skills and ongoing capacity-building needed to accommodate diverse learners in movement-based

activities. Class management (WM = 3.85) and administrative support (WM = 3.70) were rated as challenging rather than very challenging, indicating that teachers can cope with these issues to some extent but still experience them as significant. Overall, the data point to systemic limitations—especially resources and training—as the strongest factors undermining inclusive PE practice.

Despite strong belief in IPE's benefits, teachers perceived the implementation's effectiveness only at a moderate level (overall WM = 3.65; Moderately Effective). They observed that IPE effectively improves peer acceptance (WM = 3.90) and student participation (WM = 3.85), reflecting visible social and engagement gains in inclusive classes. However, broader outcomes were weaker: "improves overall class outcomes" was only moderately effective (WM = 3.55), and "supported by existing structures" was the lowest-rated indicator (WM = 3.30). This suggests that inclusive PE is producing learner-level improvements, but school-level systems and infrastructures are not yet strong enough to fully sustain or scale those gains.

Teachers also reported practical strategies that help them work around these constraints, highlighting resilience in day-to-day implementation. The most common best practices included peer-assisted learning (students supporting classmates with disabilities), activity modification and adaptation to match different ability levels, collaboration with colleagues—especially special education teachers—and continuous self-learning through webinars or training modules. These strategies function as "on-the-ground solutions" that enable inclusion even when formal supports are insufficient. However, the findings also imply that relying solely on teacher improvisation is not sustainable without institutional reinforcement.

Finally, the results directly informed policy proposals to close the feasibility and effectiveness gaps revealed in the data. Because resources and training were the most severe challenges, the study recommends a resource enhancement policy with dedicated funding for adaptive PE equipment and facilities, mandatory inclusive PE training embedded in regular professional development, class-size regulation to make inclusive management realistic, and stronger administrative support structures, such as inclusion coordinators and monitoring systems. These recommendations follow logically from the quantitative patterns: teachers are ready and willing to support IPE in principle, but effectiveness will remain moderate unless the system upgrades the material, training, and leadership conditions required for fully inclusive PE.

4. Discussion

The findings of this study corroborate a consistent pattern in inclusive physical education research: PE teachers tend to strongly endorse the *benefits* and moral value of inclusion, while simultaneously expressing reservations about *feasibility* under current school conditions. Systematic reviews and meta-analyses report generally favorable teacher attitudes toward including learners with disabilities in PE, especially regarding social participation, equity, and peer development, mirroring this study's high ratings for IPE benefits (Tarantino et al., 2022; Varea et al., 2024). However, these same reviews also note that positive attitudes weaken when teachers anticipate limited support or face more complex learner needs, which aligns with the present study's "benefit–feasibility gap" where feasibility was rated only neutral despite strong belief in IPE's value (Tarantino et al., 2022; Varea et al., 2024).

The severity ranking of barriers in the results also matches the literature's most frequently cited "hard constraints." International and local studies consistently identify inadequate resources (adaptive equipment, accessible spaces) and insufficient specialized training as the most powerful obstacles to inclusive PE, often outweighing teachers' personal willingness (Picardal, 2024; Tarantino et al., 2022; IRE Journals, 2023). Philippine-based evidence likewise highlights that PE teachers feel underprepared to modify activities and assess diverse learners because inclusive or adapted PE is not deeply embedded in pre-service curricula and in-service offerings (Picardal, 2024). This directly supports the study's finding that resource availability and

professional development were perceived as “very challenging,” positioning these as priority intervention areas.

The study’s moderate rating of implementation effectiveness is also coherent with broader evidence showing that inclusion in PE often progresses unevenly: social outcomes improve first, while systemic and instructional outcomes lag. Meta-syntheses of inclusive/adapted PE document that teachers commonly achieve partial inclusion through peer support and activity modifications, but the depth of learning and consistency of participation depend on structural supports that schools often lack (International Journal of Progressive Sciences and Technologies, 2024; UNESCO, n.d.). In other words, inclusive PE *works to a point*—especially for belonging and engagement—but remains limited in scale and sustainability without stronger institutional inputs. This parallels results where peer acceptance and participation were among the more effective outcomes, while system support indicators were weaker.

Finally, the relationships identified in the study align well with the Theory of Planned Behavior research on inclusive practice. TPB-based studies show that teachers’ positive attitudes toward inclusion predict intentions and perceived effectiveness, but actual implementation is strongly constrained by perceived behavioral control—namely, training, time, resources, and administrative norms (Ajzen, 1991; Kozina et al., 2021; Schwab et al., 2023). This aligns with the finding that higher perceived benefits/feasibility are associated with higher effectiveness, while higher challenge severity is associated with lower effectiveness. The corroboration reinforces policy conclusion: improving inclusive PE requires not only attitudinal support, but also concrete system changes that increase behavioral control (training, resources, manageable class structures, and normative administrative backing).

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IMPROVING LEARNERS' COMPETENCY IN PLANTING SEEDS THROUGH STEP-BY-STEP DEMONSTRATION VIDEOS IN AGRICULTURE LESSONS

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Abstract

This study investigated the effectiveness of step-by-step demonstration videos in improving Grade 4 learners' competency in planting seeds during Agriculture lessons under Edukasyong Pantahanan at Pangkabuhayan (EPP). A quasi-experimental one-group pretest–posttest design was implemented at Balayang Elementary School, Victoria, Tarlac, involving Grade 4 learners who completed performance-based assessments before and after exposure to the video intervention. Learners' competency was measured using a teacher-made rubric that evaluated key seed-planting indicators, including seed selection, soil preparation, planting depth and covering, spacing, watering, safety practices, and adherence to the correct sequence of procedures.

Pretest results showed that learners were moderately competent overall (M = 2.23), with the weakest performance observed in spacing and correct planting depth. After the step-by-step demonstration videos were integrated into instruction and followed by guided practice, learners' competency improved to a competent level (M = 3.16). A paired-samples t-test confirmed that the performance improvement was statistically significant ($t = 11.96$, $p = 0.001$), indicating that the video-based approach had a meaningful positive effect on learners' seed-planting skills. Qualitative findings further revealed that learners encountered challenges such as the fast-paced nature of videos, unfamiliar technical terms, poor audio-visual quality, limited device access, distractions during viewing, and the need for teacher clarification during application.

Overall, the study suggests that step-by-step demonstration videos can strengthen procedural agricultural competencies among young learners, particularly when supported by teacher guidance and opportunities for hands-on practice.

Keywords: Seed Planting, Demonstration Videos, Learner Competency, Agriculture Education, Procedural Skills, Grade 4, EPP, Video-Based Instruction

1. Introduction

Agriculture education at the elementary level plays an important role in helping learners build practical life skills and develop an early appreciation for food production and environmental responsibility. In many basic education programs, Agriculture is not taught only as a body of knowledge but as a competency-based subject that requires students to perform procedures correctly, safely, and consistently. For example, in the Philippine basic education curriculum under Edukasyong Pantahanan at Pangkabuhayan (EPP) and Technology and Livelihood Education (TLE), learners are expected to demonstrate foundational competencies such as proper tool use, safety practices, and practical agricultural tasks, including planting and propagating crops (Department of Education [DepEd], 2019). Because these competencies are performance-based, instructional methods must ensure that learners can observe correct procedures, practice repeatedly, and receive feedback that strengthens accuracy and confidence.

Among the basic agricultural skills introduced in the elementary years, planting seeds is considered one of the most essential. Seed planting requires learners to follow a sequence of steps—selecting appropriate seeds, preparing the soil or planting medium, ensuring correct depth and spacing, watering properly, and maintaining cleanliness and safety. These steps may appear

simple, but they demand careful attention to detail. When learners plant seeds incorrectly—for example, by placing them too deep or too shallow, or by overcrowding—germination rates and plant health are affected. In classroom contexts, these errors can discourage learners, reduce motivation, and create a cycle in which students avoid hands-on agricultural activities because they perceive them as difficult or prone to failure.

However, teaching procedural skills to young learners can be challenging, mainly when instruction depends heavily on one-time teacher demonstrations. In a typical classroom, the teacher demonstrates the process once and then asks learners to practice. While this approach is common, it has limitations. Learners may not have equal visibility during demonstrations; some may miss key steps, and others may quickly forget procedures once practice begins. These problems become more pronounced when classroom time is limited and when teachers must monitor several learners simultaneously. As a result, even when teachers provide clear instructions, learners may still perform tasks inconsistently due to uneven exposure and limited opportunities to revisit the procedure.

Instructional video demonstrations have increasingly been recognized as a promising approach to address these challenges. Demonstration videos offer learners a consistent model of correct performance and, more importantly, allow repeated viewing. This feature aligns with how procedural skills are developed—through observation, repetition, and gradual refinement. The value of modeling for learning is supported by Social Learning Theory, which emphasizes that individuals learn behaviors and skills through observing others, retaining the observed information, reproducing the behavior, and being motivated to perform it (Bandura, 1977). In the context of elementary Agriculture, learners can observe correct seed-planting behaviors through video, store the procedural sequence in memory, and then apply it during practice.

Beyond modeling, video demonstrations also align strongly with the principles of multimedia learning. According to the Cognitive Theory of Multimedia Learning, learners understand concepts more deeply when instruction is presented through both verbal and visual channels rather than through words alone (Mayer, 2009). In agricultural skills training, videos can demonstrate actions (e.g., how deep to plant seeds) while also explaining the rationale for each step (e.g., preventing seed rot or supporting germination). This dual-channel presentation can reduce confusion and help learners build clearer mental models of what successful performance looks like.

A key advantage of step-by-step demonstration videos is that they support self-paced learning. Learners can pause, replay, and review difficult steps—features that are rarely available in live demonstrations. This is particularly helpful for young learners who may need more time to process information or who learn at different speeds. Video modeling resources in educational practice also recommend creating distraction-free viewing contexts, ensuring that learners have access to materials while watching, and integrating videos at moments when the skill is naturally practiced (Vanderbilt Kennedy Center, n.d.). When structured properly, videos can be embedded into classroom routines so learners can watch and immediately apply what they see, strengthening retention and skill accuracy.

Even with these benefits, it is important to recognize that video demonstrations are not automatically effective unless they match learners' needs and learning contexts. Some learners may struggle with pacing, technical vocabulary, or unclear audio-visual quality. Others may have limited access to devices or may become distracted during viewing. Evidence-based resources on video modeling emphasize that successful implementation depends on careful planning—such as ensuring accessibility, checking comprehension, and providing guided practice afterward (Ohio Center for Autism and Low Incidence [OCALI], n.d.). Although some evidence-based practice materials on video modeling focus heavily on learners with special needs, the underlying instructional value of clear modeling and repeated exposure is equally relevant for general education contexts. In a competency-based subject like Agriculture, where procedural accuracy

matters, a structured, video-based approach may provide the scaffolding that helps learners progress from partial understanding to mastery.

In the Philippine elementary setting, the need for improved teaching strategies in practical Agriculture is also shaped by real classroom conditions. Teachers often face limited resources, large class sizes, and time constraints. Practical activities such as planting may be difficult to conduct repeatedly due to a lack of planting materials or school garden space. In such contexts, videos offer a cost-efficient support tool. Teachers can use the same video repeatedly across classes, share it with learners for home viewing when possible, and use it as a standardized reference for expected performance. Furthermore, DepEd learning resources and modules for EPP Agriculture already acknowledge the importance of practical application and step-by-step competency development, reinforcing the alignment of video demonstrations with curriculum goals (DepEd, 2019).

Given these considerations, investigating the effectiveness of step-by-step demonstration videos in improving seed-planting competency among Grade 4 learners is both timely and relevant. While educational technology is often associated with higher grade levels, elementary learners also benefit significantly when instructional materials match their developmental needs—especially when the task is procedural. When learners can clearly see what to do, understand why it matters, and practice with confidence, they are more likely to achieve competency and develop positive attitudes toward agricultural learning.

This study, therefore, focuses on using step-by-step demonstration videos as an instructional intervention to strengthen Grade 4 learners' competency in planting seeds in Agriculture lessons. Specifically, it examines learners' competency levels before and after the intervention, determines whether the changes are statistically significant, and explores the challenges learners encounter when using video instruction. Understanding both the benefits and the limitations of video demonstrations can help teachers refine instructional design, improve learner outcomes, and support the overall goal of competency-based learning in elementary Agriculture education.

2. Method

2.1 Research Design

The study employed a quasi-experimental research design, specifically a one-group pretest–posttest approach, to determine the effectiveness of step-by-step demonstration videos in improving Grade 4 learners' competency in planting seeds. This design was selected because it allows the researcher to measure changes in learners' performance over time using the same group of participants, making it appropriate for classroom-based interventions where random assignment and control groups may not be feasible. In this study, learners' seed-planting competency was first assessed through a pretest performance evaluation to establish baseline skill levels. After the pretest, the instructional intervention was implemented through step-by-step demonstration videos that guided learners through the correct procedures for planting seeds. Following exposure to the intervention and guided practice, a posttest performance assessment was administered using the same rubric to determine whether learners demonstrated measurable improvement. The resulting pretest and posttest scores were then compared using appropriate statistical analysis, such as a paired-samples t-test, to establish whether the observed differences were significant and attributable to the instructional strategy.

2.2 Participants

The participants of the study were Grade 4 learners enrolled in Agriculture lessons under Edukasyong Pantahanan at Pangkabuhayan (EPP) at Balayang Elementary School, located in Barangay Balayang, Victoria, Tarlac. The selection of participants followed a purposive

sampling approach through total enumeration, wherein all learners in the identified Grade 4 class section were included to ensure complete representation of the target group. These learners were chosen because seed planting is a required competency in the Grade 4 Agriculture curriculum and because classroom observations indicated the need to strengthen procedural skills in planting. As the primary beneficiaries of the intervention, the participants underwent both pretest and posttest performance assessments. They participated in step-by-step demonstration video sessions, enabling the study to examine measurable changes in their seed-planting competency within an authentic classroom context.

2.3 Instrumentation

The study used a set of research instruments to measure learners' competency in planting seeds and to capture the contextual challenges encountered during the intervention. The primary instrument was a teacher-made performance assessment rubric aligned with the Grade 4 Agriculture learning competencies under EPP, which served as the basis for evaluating learners' procedural performance during both the pretest and posttest. The rubric covered key indicators of seed-planting competency, including selecting appropriate seeds, preparing materials, following the correct planting depth and spacing, applying proper watering techniques, maintaining cleanliness and safety, and observing the correct sequence of steps. To supplement quantitative findings and enrich the interpretation of results, the study also employed learner feedback/reflection prompts and teacher observation notes to document learners' experiences as they used the step-by-step demonstration videos. These qualitative tools were used to identify recurring issues in comprehension, pacing, accessibility, and the application of video-demonstrated procedures during hands-on practice, thereby providing a more comprehensive understanding of the intervention's effectiveness and limitations.

2.4 Data Analysis

Data analysis in the study involved both descriptive and inferential procedures to determine the effectiveness of step-by-step demonstration videos in improving learners' seed-planting competency. Quantitative data from the pretest and posttest performance assessments were first summarized using descriptive statistics, including mean scores and standard deviations for each competency indicator and overall performance. These values were interpreted using the study's competency rating scale to describe learners' baseline and post-intervention skill levels. To determine whether the observed improvements were statistically significant, the study used a paired-samples t-test, which compared the mean pretest and posttest scores within the same group of participants and assessed whether the difference could be attributed to the intervention. Qualitative data gathered through learner feedback and teacher observation notes were analyzed using thematic grouping, wherein recurring statements and patterns were clustered into common themes reflecting the challenges learners encountered while using the video-based instruction. The integration of these quantitative and qualitative analyses provided both statistical evidence of learning gains and contextual insight into factors affecting implementation and learner performance.

3. Results

The study found that step-by-step demonstration videos led to a marked improvement in Grade 4 learners' seed-planting competency. Prior to the intervention, learners demonstrated an overall moderately competent performance level, with a pretest mean score of M = 2.23, and the weakest skills observed in precision-based indicators such as seed spacing (M = 1.92) and planting depth and covering (M = 2.05). Following exposure to the video-based instruction and guided practice, learners' performance increased to an overall competent level, reflected by a posttest mean score of M = 3.16, with gains evident across all rubric indicators,

including those previously identified as challenging. The improvement between the pretest and posttest scores was statistically significant, as confirmed by the paired-samples t-test ($t = 11.96$, $p = 0.001$), indicating that the intervention had a meaningful effect on learners' competency. In addition to these quantitative gains, qualitative findings revealed that learners encountered implementation-related challenges, including difficulty following the video's pacing, unfamiliarity with technical terms, unclear audiovisual quality, limited device access, distractions during viewing, and the continued need for teacher clarification during hands-on application. Overall, the results suggest that step-by-step demonstration videos are effective instructional supports for strengthening procedural agricultural skills, particularly when complemented by teacher guidance and immediate practice opportunities.

4. Discussion

The findings of this study demonstrate that step-by-step demonstration videos are effective instructional supports for improving Grade 4 learners' competency in planting seeds. The statistically significant increase in posttest performance suggests that learners benefited from repeated exposure to a clear and consistent procedural model. This improvement is consistent with theoretical perspectives that emphasize learning through observation and imitation. Social Learning Theory posits that learners acquire new behaviors by attending to a model, retaining observed sequences, reproducing them through practice, and sustaining performance through motivation and reinforcement (Bandura, 1977). In the context of seed planting, the videos served as a stable model of expected performance, enabling learners to revisit specific steps such as seed spacing, planting depth, and sequencing—components that are often missed during one-time classroom demonstrations. This modeling advantage is significant in elementary competency-based instruction, where mastery depends on accurate procedural execution rather than recall alone. Moreover, the use of demonstration videos aligns with the EPP/TLE curriculum's emphasis on developing practical life skills through application-oriented learning experiences, making the intervention relevant to the competency-based goals of Philippine basic education (Department of Education [DepEd], 2023).

The improvement in learners' performance may also be explained through multimedia learning principles, which highlight how combining verbal explanations with visual representations supports deeper understanding and skill acquisition. The Cognitive Theory of Multimedia Learning argues that learners process information through dual channels—visual and verbal—and build stronger mental representations when they can integrate spoken or printed explanations with images and demonstrations (Mayer, 2009). Seed planting requires learners to understand not only what to do but also how to do it precisely, such as gauging correct depth, spacing seeds evenly, and applying appropriate covering techniques. Demonstration videos provide a form of guided procedural visualization that reduces ambiguity, particularly for learners who struggle with abstract instructions. In addition, the videos allow learners to control the pacing of learning by pausing and replaying difficult portions, reinforcing retention and increasing confidence during hands-on practice. Practical guidance on video modeling emphasizes that this approach is most effective when learners can clearly see and hear the modeled behavior and when the modeled skill is embedded in routines that allow learners to apply what they observe immediately (Vanderbilt Kennedy Center, n.d.).

Although the quantitative results confirm the intervention's effectiveness, the qualitative findings highlight important implementation constraints that may influence learning outcomes in real classroom settings. Learners reported difficulty keeping up with the video's pacing, challenges understanding technical terms, and issues with audio-visual clarity, all of which can limit comprehension and reduce the effectiveness of video-based instruction. These challenges align with evidence-based recommendations for video modeling, which stress that videos should be deliberately designed with learner needs in mind—using clear visuals, manageable segments,

minimal distractions, and accessibility supports such as structured guidance and opportunities for clarification (OCALI, n.d.). This reinforces the idea that demonstration videos function best as scaffolding tools rather than replacements for teacher instruction. In practical Agriculture lessons, teacher facilitation remains essential for ensuring learners understand key vocabulary, correcting misconceptions in real time, and providing feedback as learners translate observed procedures into actual performance. Furthermore, access barriers such as limited devices and distractions during viewing indicate that video integration must be planned with contextual realities in mind, particularly in settings where learning resources may be unevenly distributed. Overall, the study supports integrating demonstration videos into a blended, practice-driven approach to competency development, provided that teachers address design quality, pacing, and guided application to maximize learning gains.

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EXPLORING THE CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING TECHNOLOGY-BASED TRAINING IN TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

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Abstract

Technology-based training has become a critical strategy for modernizing Technical and Vocational Education and Training (TVET) systems in response to Industry 4.0 and shifting workforce demands. In the Philippines, the Technical Education and Skills Development Authority (TESDA) has advanced flexible learning policies and online initiatives to widen access and sustain training delivery. However, institutional implementation remains uneven, particularly in provincial Technology Institutions (TTIs). This study explored the challenges and opportunities in implementing technology-based training in selected TESDA TTIs in Pangasinan, Philippines, using a qualitative descriptive case study design anchored on Rogers' Diffusion of Innovations Theory. Data were generated through semi-structured interviews and focus group discussions with administrators, trainers, and trainees, supplemented by document review, and analyzed using thematic analysis. Findings indicate that TTIs primarily employ blended learning arrangements, with face-to-face sessions reserved for hands-on competencies and online platforms used for theory instruction, assessment, and coordination. Stakeholders reported notable advantages, including improved access to learning resources, enhanced instructional efficiency, better monitoring, and strengthened workplace-relevant digital skills.

Nevertheless, implementation was constrained by ICT infrastructure deficits, unstable internet connectivity, limited devices, gaps in digital competencies, increased trainer workload, and pronounced equity issues among trainees. Participants also identified opportunities to strengthen technology integration through systematic capacity building, improved infrastructure investments, expanded use of virtual simulations, and the development of sustainability strategies aligned with TESDA's modernization priorities. The study concludes that while technology-based training demonstrates clear value for expanding access and improving training relevance, its sustainability requires coordinated institutional support, equity-oriented interventions, and policy-driven investment to enable deeper diffusion across TTIs.

Keywords: TESDA; technology-based training; TVET; blended learning; Diffusion of Innovations; flexible learning; digital transformation

1. Introduction

The accelerated diffusion of digital technologies across workplaces has redefined the competencies expected of technical workers and, by extension, the mandate of Technical and Vocational Education and Training (TVET) systems. Industry 4.0—characterized by cyber-physical systems, automation, artificial intelligence, and digitally networked production—has intensified the demand for workers who possess not only trade-specific competencies but also transversal digital literacy, adaptive problem-solving, and technology-enabled collaboration. In response, TVET institutions globally have been urged to modernize instructional delivery and assessment practices through technology-based training approaches, including e-learning, blended learning, digital simulations, and mobile learning platforms. Such approaches are increasingly viewed as essential mechanisms for expanding access, improving training flexibility,

enhancing learning engagement, and aligning vocational programs with evolving labor-market requirements.

The urgency of digital transformation in education and workforce development was magnified by the COVID-19 pandemic, which compelled training institutions to adopt remote, flexible delivery models. In many countries, the pandemic acted as a catalyst for the rapid adoption of technology-supported learning systems, exposing both the potential and fragility of digital training infrastructures. International development institutions have documented how technology-enabled vocational initiatives can improve employability and income outcomes when designed to support inclusion and economic mobility. For example, large-scale skills and training programs that integrate digital tools have been associated with improved access to non-farm employment and enhanced earnings, particularly among disadvantaged groups (World Bank, 2021). In parallel, research and policy institutions in Europe have emphasized that the digital transition in TVET requires systemic investments not only in infrastructure but also in trainers' digital competencies and in the modernization of curriculum and assessment systems to avoid reproducing inequities (Cedefop, 2020).

In the Philippine context, digital transformation is a key strategic direction for government and public service modernization. The Department of Information and Communications Technology (DICT) underscores that a national digital strategy aims to improve governance, socioeconomic development, and service delivery by effectively leveraging information and communications technology (ICT) (Digital Watch Observatory, 2022). Such macro-level digital transformation objectives have direct implications for workforce development agencies, particularly TESDA, which is mandated to ensure that technical education remains responsive to labor market conditions and national development priorities. Under Republic Act No. 7796, TESDA is tasked with providing relevant, accessible, and quality technical education and skills development programs for Filipinos, including initiatives that ensure competitiveness in both domestic and global labor markets (Republic Act No. 7796, 1994). As workplaces adopt digital systems and technology-integrated operations, TESDA must ensure that training delivery mechanisms evolve accordingly and that learners acquire digital competencies that complement trade skills.

TESDA's response to these challenges has included the development of technology-based, flexible learning initiatives, most notably the TESDA Online Program (TOP), as well as policy frameworks for flexible learning delivery. TOP is a web-based platform offering free Massive Open Online Courses (MOOCs) intended to expand opportunities for skills development and lifelong learning (TESDA, n.d.-a). Through TOP, learners can access self-paced training modules across multiple sectors, supporting broader participation in workforce education beyond conventional face-to-face training. Complementing TOP, TESDA issued Circular No. 062, series of 2020, which provides guidelines for implementing flexible learning in the delivery of TVET, particularly in response to changing societal conditions and the "new normal" brought about by disruptions such as the pandemic (TESDA, 2020). The circular affirms TESDA's policy direction toward blended, distance, and other flexible delivery approaches to ensure continuity of training while maintaining quality assurance.

Further, TESDA's strategic agenda is articulated in the National Technical Education and Skills Development Plan (NTESDP) 2023–2028, which positions skills development as a mechanism for preparing Filipinos for a rapidly changing economy and highlights the importance of strengthening training systems amid global transformations (TESDA, 2023). While the NTESDP provides a national roadmap, its implementation necessarily depends on the readiness and capacity of TESDA Technology Institutions (TTIs), which serve as frontline delivery hubs of public TVET programs. However, evidence from both local observations and national development analyses indicates that the effectiveness of technology integration in training institutions remains uneven, constrained by persistent gaps in infrastructure, connectivity, and

resource capacity—particularly in rural or non-metropolitan areas where digital access and institutional investments tend to lag (Cedefop, 2020; TESDA, 2020).

This unevenness is especially critical in provinces such as Pangasinan, where TTIs play an important role in providing access to skills development for out-of-school youth, low-income individuals, and underemployed workers. In such settings, technology-based training has strong potential to expand access, improve learning flexibility, and increase employability outcomes, but only if institutional conditions support equitable adoption. In practice, TTIs must simultaneously maintain the integrity of hands-on competency-based training while incorporating digital platforms for theory delivery, assessment, learner support, and administrative monitoring. As reflected in the present study's context, TTIs in Pangasinan have begun adopting blended learning approaches and accessible platforms such as Google Classroom and online communication tools for learning management. However, they face constraints, including limited ICT infrastructure, intermittent internet connectivity, shortages of devices and digital tools, and gaps in the digital capabilities of trainers and learners (Luzadas, 2025).

These realities highlight a central tension in technology-based TVET: while digital systems can enhance efficiency, flexibility, and engagement, they can also intensify inequities when trainees lack devices, affordable data, or supportive learning environments. Moreover, trainers may face additional workload demands and pedagogical challenges when transitioning from traditional to digitized or hybrid instruction. Institutional policy mandates can drive adoption, but if implementation support is inadequate—through insufficient funding, limited IT personnel, or a lack of localized digital content—technology-based training may focus on surface-level digitization rather than transformative learning innovation. The present study is situated within this policy and institutional context, focusing on the lived realities of TTIs' implementation and the perceptions of key stakeholders.

Accordingly, this research sought to explore the challenges and opportunities in implementing technology-based training in TESDA, focusing on TESDA Technology Institutions (TTIs) in Pangasinan. Specifically, it examined: (1) current institutional practices in technology-based training; (2) perceived advantages of technology-based delivery among administrators, trainers, and trainees; (3) challenges encountered by each stakeholder group; (4) perceived opportunities for enhancing technology integration; (5) institutional factors influencing implementation; and (6) a proposed framework for sustainability of technology-based training (Luzadas, 2025).

The study is anchored in Rogers' Diffusion of Innovations (DOI) Theory, which explains how innovations spread across a social system through stages of adoption and varying adopter categories. DOI provides a useful lens for analyzing how institutional stakeholders—administrators, trainers, and trainees—move from awareness and persuasion to implementation and confirmation of technology-based training practices. It also enables examination of how structural barriers (e.g., connectivity, resource constraints, support systems) and enabling factors (e.g., leadership buy-in, policy direction, capacity building) influence adoption trajectories. In the context of TESDA TTIs, DOI is particularly appropriate because technology-based training is not merely a technical upgrade; it represents a systemic shift in pedagogy, institutional culture, and resource allocation.

Ultimately, understanding the institutional realities of technology-based training implementation in TESDA TTIs is crucial to achieving the policy goals of accessible, inclusive, and high-quality TVET. By documenting the challenges and opportunities experienced at the local level, the findings of this study are expected to inform policy refinement, infrastructure planning, trainer upskilling initiatives, and the development of context-sensitive sustainability strategies. In doing so, the study contributes to TESDA's broader modernization agenda and supports national aspirations to develop a globally competitive workforce equipped with both technical and digital competencies.

2. Method

2.1 Research Design

This study adopted a qualitative descriptive case study design to examine the challenges and opportunities in implementing technology-based training in TESDA Technology Institutions (TTIs) in Pangasinan. A qualitative approach was appropriate because the inquiry required an in-depth, context-sensitive understanding of how technology-enhanced training is enacted in real institutional settings, including the meanings and experiences associated with adoption across different stakeholder groups. The case study strategy was selected because it enables systematic investigation of contemporary practices within bounded settings where implementation conditions—such as infrastructure, institutional support, and learner access—are inseparable from the phenomenon being studied.

The case was defined as the institutional implementation of technology-based training within selected TTIs, with emphasis on routine practices, enabling conditions, and constraints affecting delivery. The design was multi-perspectival, incorporating insights from key stakeholders—administrators, trainers, and trainees—to capture differences in perceptions, responsibilities, and access to resources across roles. This stakeholder-inclusive approach deepened interpretation by enabling the study to examine how institutional readiness and technology adoption are experienced across levels of leadership, instruction, and learning.

Data were generated through qualitative techniques, including semi-structured interviews and/or focus group discussions, supplemented by relevant institutional documents where available. Data were analyzed using thematic analysis, allowing patterns and recurring issues to emerge from participant accounts while supporting interpretation through the study's guiding theoretical lens. Rather than seeking statistical generalization, the design prioritized analytical depth and contextual explanation, generating findings that may inform technology integration strategies and sustainability planning within TESDA TTIs and other comparable TVET environments.

2.2 Participants

Participants were selected using purposive sampling, consistent with the qualitative descriptive case study design, to ensure that data were obtained from individuals with direct and sustained involvement in the implementation, delivery, or experience of technology-based training in TESDA Technology Institutions (TTIs) in Pangasinan. The study included three stakeholder groups to capture multi-level perspectives on technology integration: administrators, trainers, and trainees.

The administrator group comprised TESDA personnel with institutional oversight roles, including TESDA administrators, program coordinators, and ICT focal persons. Eligible participants were those currently employed in the TTIs in Pangasinan, actively involved in planning, supervision, or implementation of training programs, and with at least one (1) year of experience managing TESDA-related training delivery.

Trainer participants included TESDA-certified instructors assigned to handle technology-based or ICT-integrated courses within the participating TTIs. Inclusion criteria required trainers to be currently teaching in TESDA TTIs, actively using digital tools, platforms, or blended learning strategies, and to have at least six (6) months of experience conducting technology-integrated training.

Trainees were learners currently enrolled in TESDA programs offered by the TTIs that involve technology use (e.g., Computer Systems Servicing or other courses delivered through blended or technology-supported modules). Participants were required to have completed at least 50% of the training duration, ensuring adequate exposure to the training modality, and to be willing to participate in interviews and/or focus group discussions.

Recruitment continued until data saturation was achieved, meaning additional interviews and discussions yielded no new significant insights or themes.

2.3 Instrumentation

Data were collected using researcher-developed qualitative instruments aligned with the study's descriptive case study design. The primary instruments included a semi-structured interview guide and focus group discussion (FGD) guides, designed to elicit detailed accounts of stakeholders' experiences with the implementation of technology-based training in TESDA Technology Institutions (TTIs) in Pangasinan. These tools were designed to elicit information on institutional practices, perceived benefits, implementation challenges, enabling factors, and opportunities to improve technology integration.

A semi-structured interview guide was used to collect in-depth qualitative data from administrators, trainers, and trainees. The guide consisted of open-ended questions that explored how technology was used in instructional delivery, assessment, and program management; the support systems available (e.g., ICT infrastructure, technical assistance, and digital content); and the challenges and opportunities stakeholders encountered in adopting technology-based training. The instrument was explicitly aligned with the research questions. It was reported to have undergone expert validation by individuals with competencies in TVET and qualitative research, strengthening its content adequacy and appropriateness for the study context.

To capture interactive and collective insights, the study also employed FGD guides for trainers and trainees. The trainer FGD guide focused on routine technology use in teaching, preparation, and delivery; challenges related to connectivity and device access; digital literacy constraints; perceived improvements in engagement and performance; and the adequacy of institutional support and policy mechanisms. The trainee FGD guide explored trainees' lived experiences in technology-mediated learning, including the tools used during training, their attitudes toward technology integration, and problems encountered, such as limited access to devices, internet connectivity, and platform usability.

2.4 Data Analysis

All data generated from semi-structured interviews, focus group discussions (FGDs), and document reviews were subjected to a systematic qualitative analysis. Before formal coding, the dataset was cleaned, organized, and prepared, including the transcription of recorded interviews/FGDs, translation into English where required, and the assignment of unique participant codes to preserve confidentiality. This process ensured that responses were complete, comparable across stakeholder groups, and ready for interpretive analysis.

The study primarily utilized manual thematic analysis to identify recurring patterns and meanings across stakeholder narratives. Coded segments were clustered into categories and themes aligned with the study's research questions, allowing the researcher to structure findings around institutional practices, perceived advantages, challenges, opportunities, and institutional factors affecting technology integration. For the first research question, thematic analysis focused on practices such as the use of digital platforms, blended delivery arrangements, instructional tools, assessment approaches, and trainer preparedness. For subsequent questions, thematic coding and clustering were applied to examine stakeholder perceptions of advantages, challenges, and opportunities, and comparisons were made across administrator, trainer, and trainee groups to surface convergent and divergent patterns.

To strengthen analytic rigor, the study incorporated triangulation by integrating qualitative findings with quantitative or frequency-based indicators where appropriate. Specifically, challenge-related themes were not only identified qualitatively but also supported by frequency analysis, which reflected how frequently particular constraints appeared across respondent groups. The integration of qualitative and quantitative evidence served as a validation

mechanism, enhancing the credibility and reliability of the study's interpretations. Finally, the sustainability framework proposed in the study was developed through the synthesis of the emergent themes across research questions, ensuring that the recommended model was grounded in the empirical realities documented during analysis.

3 Results

The results are organized according to the study's research questions and reflect the thematic findings derived from interviews, focus group discussions, and document analysis. Overall, the findings show that TESDA Technology Institutions (TTIs) in Pangasinan have begun transitioning toward technology-based training. Still, implementation remains uneven and is constrained by infrastructure limitations, capacity gaps, and learner access challenges.

The dominant implementation model across the TTIs is basic blended delivery, where face-to-face sessions are reserved for hands-on competency training. At the same time, online platforms are used for theory-based instruction, quizzes, assignments, and administrative tasks. Google Classroom emerged as the principal learning platform because it is free, accessible, and compatible with mobile devices. In addition, trainers commonly use multimedia presentations (e.g., PowerPoint) during lectures and rely on Google Forms for formative or diagnostic assessments. Institutional program management also demonstrates early digital adoption using cloud storage (shared drives) for e-recordkeeping and messaging platforms (e.g., Facebook Messenger) for announcements and coordination.

However, technology integration is not uniform across programs. Specialized software and more advanced digital applications are concentrated in ICT-related programs (e.g., ICT and animation), while traditional trades continue to rely primarily on conventional, hands-on equipment, with minimal use of simulation tools or advanced digital training resources.

Stakeholders across groups acknowledged the benefits of technology integration, but the emphasis varied by role. Administrators highlighted advantages in efficiency and system compliance, noting that online platforms facilitate reporting, monitoring, and alignment with flexible learning mandates. Trainers perceived technology as enhancing instructional efficiency and pedagogy by allowing theoretical instruction and digital assessment to reduce time spent on routine tasks, enabling greater focus on hands-on practice and targeted remediation. Trainees, in contrast, emphasized benefits related to accessibility and work-readiness, particularly the ability to access learning materials anytime and to develop digital skills increasingly relevant to employment.

Taken together, these results indicate that technology-based training is perceived as useful in expanding access, strengthening learner autonomy, improving administrative monitoring, and building workplace-aligned digital competencies, even when implementation remains modest in scale.

Despite perceived benefits, the study found persistent and multi-layered constraints affecting sustainability and scale-up. Administrators reported a severe resource and capacity gap, characterized by inadequate ICT budgets, weak internet connectivity, limited infrastructure, insufficient IT personnel, and a lack of localized digital learning content. Trainers experienced a digital skills deficit and increased workload, particularly due to the demand for digitizing modules, developing online content, and conducting assessments while lacking adequate institutional support. Trainers also reported challenges in remote monitoring of trainee progress, which often required reliance on personal devices, personal internet subscriptions, and self-funded learning resources.

For trainees, the most prominent barrier was the technology equity gap: many rely primarily on smartphones rather than laptops, experience intermittent connectivity, and struggle with the cost of mobile data. This was compounded by unstable systems that sometimes led to

missed submissions or data loss and created the need for immediate technical support that institutions could not always provide.

Overall, the results show that technology-based training adoption is constrained not only by technology availability but also by institutional readiness, trainer capacity, and inequitable access conditions among learners.

Participants' perceived opportunities were strongly future-oriented and aligned with modernization goals. Administrators framed opportunities in terms of global competitiveness, resource mobilization, systematic quality control, and evidence-based planning, emphasizing the role of technology in aligning training with Industry 4.0 and improving institutional performance through standardized platforms and analytics.

Trainers emphasized instructional opportunities such as access to virtual simulations and advanced learning tools, the ability to deliver personalized instruction through multimedia, and professional development through continuous upskilling. Trainees highlighted opportunities linked to improved job readiness, reinforced skill acquisition through repeatable video demonstrations, increased autonomy in learning, and stronger collaboration through shared documents and online tools.

These findings suggest that although technology-based training is constrained by current limitations, stakeholders view it as a viable pathway for institutional modernization, instructional improvement, and labor-market relevance.

4 Discussion

Consistent with DOI, the adoption of technology-based training in Pangasinan TTIs appears to be a staged, role-dependent process influenced by perceived relative advantage, compatibility with existing training structures, complexity, trialability, and observable outcomes (Rogers, 2003). The results indicate that TTIs are currently operating at an early-to-intermediate adoption stage, where technology is used largely to complement rather than transform competency-based delivery. Most institutions implement basic blended arrangements—face-to-face sessions for hands-on competencies and online platforms for theory, assignments, and coordination—reflecting a pragmatic approach to innovation that minimizes disruption and fits existing training requirements. This pattern is strongly aligned with TESDA's formal policy direction, which promotes flexible learning as an alternative delivery mode to ensure continuity and widen access (TESDA, 2020).

A key finding is that adoption is concentrated around tools with low entry barriers, notably Google Classroom, Google Forms, and basic multimedia presentations. This reflects DOI's expectation that innovations perceived as less complex and more compatible with existing routines diffuse faster than those requiring major technical or pedagogical shifts (Rogers, 2003). In other words, TTIs are selecting technologies that can be rapidly adopted without requiring extensive infrastructure or redesign of instructional systems. This may be viewed as a rational institutional adaptation: trainers and administrators appear to leverage accessible platforms that function adequately under constraints such as intermittent connectivity, limited devices, and uneven digital capabilities among learners.

However, the study also found that adoption is uneven across programs, with more advanced software and deeper integration concentrated in ICT-related areas (e.g., animation, ICT programs). At the same time, other trades remain primarily hands-on with minimal digital augmentation. This highlights the role of innovation compatibility: programs already predisposed to digital tools can more readily integrate technology-based instruction, whereas trade programs rooted in physical equipment and workshop-based training face greater constraints. Importantly, this program-level variation suggests that "technology-based training" in the TTIs currently functions more as supplemental digitization than full instructional transformation—a common trajectory in early adoption environments.

Across administrators, trainers, and trainees, the study documented clear perceived benefits of technology-based training. Administrators emphasized efficiency in monitoring, coordination, and compliance; trainers highlighted instructional convenience and enhanced teaching strategies; trainees emphasized accessibility and digital employability benefits. These perceived advantages are central predictors of diffusion under DOI and help explain why technology-based training is sustained even when institutional conditions remain suboptimal (Rogers, 2003).

From a policy standpoint, these benefits reinforce TESDA's intent in implementing flexible learning approaches. TESDA Circular No. 062 frames flexible learning as a necessary strategy to maintain responsive training delivery amid shifting social conditions and to provide alternative modalities for learners (TESDA, 2020). The study's findings support this policy direction by demonstrating that basic digital platforms can widen access and enable learning continuity, especially for theory content and administrative processes. Moreover, the trainee-reported gains in workplace-relevant digital skills suggest that technology-based training can serve as a "dual function" mechanism: it supports training delivery while simultaneously building transversal competencies required in digitizing labor markets.

Despite perceived value, the most salient discussion point is that technology-based training implementation remains constrained by interrelated barriers: limited infrastructure, weak connectivity, inadequate devices and ICT tools, insufficient digital content, and deficits in skills and support. Administrators emphasized institutional resource gaps and insufficient IT support; trainers reported increased workload and skill development needs; trainees highlighted inequitable access to devices and connectivity, often relying on smartphones and inconsistent data availability. These findings align with global evidence that the digital transition in vocational education depends not only on providing platforms but also on strengthening institutional capacity, trainer preparedness, and inclusion-oriented access structures (Cedefop, 2025).

The observed challenges also closely align with DOI's "complexity" and "compatibility" dimensions. Technology-based training introduces complexity in several ways: it requires trainers to redesign materials, manage dual-mode delivery, monitor learner engagement remotely, and troubleshoot technology barriers. This complexity increases the perceived cost of adoption—mainly when instructors must rely on personal resources or when institutional IT support is limited. The workload burden reported by trainers suggests that diffusion may stagnate unless institutions implement systematic support (e.g., content repositories, instructional design assistance, trainer upskilling pathways, and stronger ICT infrastructure). If such support is absent, technology-based training risks remaining at a shallow level of digitization, where platforms are used merely for compliance or basic logistics rather than to improve learning outcomes and training quality.

For trainees, the equity gap is particularly consequential. When learners lack devices or connectivity, technology-based delivery can unintentionally widen disparities in participation and performance. This outcome is consistent with broader critiques of digital learning implementation, which caution that technology can reinforce exclusion when access is unequal and when training environments assume device ownership and stable internet availability. From an institutional perspective, the results suggest that technology integration cannot be evaluated solely on adoption metrics (e.g., "platform usage"), but must be assessed through equity indicators such as device access, learning continuity, and support availability.

Stakeholders identified opportunities that position technology-based training as a pathway to modernization, Industry 4.0 alignment, and improved employability outcomes, including the use of simulations, improved learner autonomy, enhanced analytics for monitoring, and strengthened collaboration and content sharing. These opportunities align with TESDA's medium-term strategic direction articulated through the National Technical Education and Skills Development Plan (NTESDP) 2023–2028, which emphasizes future-ready skills and system strengthening to ensure workforce competitiveness in a rapidly evolving global economy (TESDA, 2023).

However, translating opportunity into implementation requires a shift from ad hoc adoption to structured institutional scaling. Under DOI, the movement from implementation to confirmation depends on sustained reinforcement, visible positive outcomes, and adopters' ability to normalize the innovation within routine operations (Rogers, 2003). The study's proposed sustainability directions—such as strengthening infrastructure, building digital capability, ensuring equity mechanisms, and formalizing support systems—are therefore not ancillary recommendations but essential requirements for diffusion to mature. Without investment and governance alignment, TTIs may remain in a cycle of partial adoption where technology is used inconsistently, and benefits are not maximized.

The findings have several implications for TESDA and TTIs. First, while TESDA's flexible learning policy enables adoption, policy implementation should be accompanied by structured institutional support and capacity-building to reduce trainer workload and improve instructional quality (TESDA, 2020). Second, TTIs require a more deliberate digitalization framework emphasizing not only platform adoption but also infrastructure upgrades, content development, and digital pedagogy standards—consistent with broader recommendations for strengthening VET's role in the digital transition (Cedefop, 2025). Third, equity mechanisms are critical: ensuring device access, improving connectivity, and providing learner support structures are necessary to prevent technology-based training from excluding marginalized trainees. Finally, in alignment with NTESDP 2023–2028, these institutional improvements can help ensure that TTIs serve as effective public delivery hubs for future-ready and digitally enabled TVET (TESDA, 2023).

In summary, the study demonstrates that technology-based training in Pangasinan TTIs is valued and emerging, but remains constrained by systemic barriers that hinder deeper transformation. Viewed through DOI, the TTIs exhibit early diffusion characterized by adoption of low-complexity tools, stakeholder recognition of relative advantage, and persistent barriers related to complexity and inequity. To advance diffusion toward sustainability and institutional normalization, TESDA and TTIs must strengthen infrastructure, professional development, and equity-oriented support systems so that technology integration becomes not only a response mechanism but a durable strategy for improving TVET quality and labor-market alignment.

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ARTIFICIAL INTELLIGENCE VERSUS HUMAN CRAFTED PERSONALIZED TRAINING PROGRAM IN MEN'S VOLLEYBALL TEAM

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Abstract

Artificial intelligence (AI) is increasingly being explored as a tool for improving athletic performance and reducing injury risk through data-driven personalization. In volleyball, where jumping ability and serve speed are essential to competitive success, individualized training programs may offer substantial advantages. This study compared the effectiveness of an AI-generated personalized training program with a human-crafted personalized training program among male volleyball players in Dagupan City, Ilocos Region, Philippines. Using a quantitative quasi-experimental design, approximately 300 participants were assigned to either the AI-based training group or the coach-designed training group. Performance outcomes were measured using objective field instruments: vertical jump height was assessed through a Vertec device and serve speed was recorded using a radar gun. Training exposure was tracked through training logs, while injury occurrence was documented using injury records and calculated per 1000 athlete-hours. Team performance was evaluated using win percentage before and after the intervention period.

Results showed that the AI-generated training program produced significantly greater improvements in performance and safety outcomes. The AI group recorded higher average gains in vertical jump height (4.6 cm) compared with the human-crafted group (3.2 cm). Serve speed also improved more in the AI group (3.2 km/h) than in the human-crafted group (1.9 km/h), despite similar total training hours. Injury rates were lower in the AI group (0.056 per 1000 athlete-hours) compared with the control group (0.090), indicating better injury risk management. In addition, teams using AI-based training demonstrated greater improvement in win percentage than those using human-designed programs. Overall, the findings suggest that AI-generated personalized training can enhance volleyball performance, reduce injury occurrence, and contribute to improved competitive outcomes when applied in real training environments.

Keywords: Artificial Intelligence; Personalized Training; Men's Volleyball; Vertical Jump; Serve Speed; Injury Prevention; Athlete Performance; Training Load

1. Introduction

Volleyball is a high-intensity intermittent team sport that requires repeated bouts of explosive actions, particularly vertical jumping and high-velocity ball striking during serving and spiking. Success in men's volleyball is strongly influenced by an athlete's ability to generate rapid force and power, as reflected in metrics such as vertical jump height and ball speed (Baena-Raya et al., 2021). Because these biomechanical demands occur repeatedly within matches and across training cycles, volleyball players are exposed not only to performance constraints but also to a persistent risk of injury, particularly when training load, recovery, and movement mechanics are not adequately managed. Consequently, contemporary volleyball conditioning increasingly emphasizes individualized programming—training prescriptions tailored to an athlete's performance profile, workload tolerance, and injury history—to maximize competitive outcomes while minimizing health risks.

Personalized training programs have long been used in sports through coach-led assessment and periodized programming, in which training volume, intensity, and skill demands

are adjusted based on athlete readiness and performance indicators. However, even in well-resourced systems, human-crafted personalization faces limitations. Coaches must make decisions under time pressure, often while monitoring large volumes of athlete data from performance testing, match statistics, and training logs. As sports science has become more data-rich, the burden on practitioners has increased significantly, and traditional approaches may struggle to scale effectively while preserving individual specificity (Claudino et al., 2019). This challenge is magnified in team sports such as volleyball, where multiple athletes with different positions, tactical roles, and physical capacities train simultaneously, requiring individualized progression strategies that remain aligned with team schedules and competition calendars.

In recent years, artificial intelligence (AI) and machine learning (ML) have emerged as promising tools to support decision-making in sports training, injury prevention, and performance enhancement. AI systems can process multivariate datasets, identify patterns not easily detectable by human judgment, and generate optimized training recommendations based on athlete-specific profiles. Systematic reviews in team sports have highlighted AI's expanding role in injury risk assessment and performance prediction, particularly its capacity to integrate diverse data streams, such as training load, biomechanical metrics, wellness surveys, and match exposure (Claudino et al., 2019). More recent literature suggests that AI and ML are increasingly applied not only for prediction tasks but also for practical performance monitoring and intervention support, including individualized program design and adaptive progression (Reddy, 2025).

An important driver of AI adoption in sport is the rapid growth of wearable and sensor technologies, which provide continuous monitoring of physiological and biomechanical indicators. Wearable devices capture data such as heart rate, movement velocity, accelerations, jump counts, and fatigue-related proxies that can inform training decisions. The integration of wearable sensor technology and automated analytics has been identified as a key innovation in injury prevention and performance optimization, enabling proactive risk detection and real-time adjustments to athlete workloads (Sensor-enhanced wearables and automated analytics for injury prevention, 2024). These developments support the rationale that training prescription can be enhanced when analytics move beyond descriptive monitoring toward intelligent, individualized decision support.

Machine learning approaches are particularly attractive for injury prevention because injury events arise from complex, interacting risk factors. Load exposure, inadequate recovery, prior injury, movement patterns, and contextual factors (e.g., training surface and competition density) may all contribute. ML models can analyze these complex relationships at scale and provide probabilistic injury-risk signals. For example, recent research in sports medicine has emphasized that the availability of athlete load data has significantly increased interest in machine learning injury prediction methods and has encouraged the use of algorithms such as random forests, neural networks, and other predictive architectures (Bittencourt et al., 2025). Although injury prediction remains methodologically challenging, the direction of research supports the practical potential of algorithm-assisted training management, especially when integrated with coach expertise.

While earlier AI applications in sport focused on predictive analytics (e.g., injury probability and performance forecasting), the development of generative AI and adaptive decision systems has expanded AI's potential role in training program design. Generative AI tools can synthesize training recommendations based on an athlete's goals, constraints, and progress metrics, producing scalable individualized programs with reduced time demands on coaches. A recent review examining generative AI in exercise and training prescription identified growing interest in using models such as ChatGPT and similar systems to enhance personalization and scalability; however, it also emphasized that reliability, contextual accuracy, and implementation strategy remain critical limitations requiring empirical investigation (Rossi et al., 2025). These findings

suggest that AI-generated prescriptions may offer operational advantages, but validation against traditional coach-designed programs is needed to confirm effectiveness and safety.

For men's volleyball specifically, vertical jump performance and serve ball speed represent practical and meaningful indicators of competitive capability. Jump height directly influences spiking reach and blocking efficiency, while serve speed increases pressure on opponents and can elevate scoring opportunities. Research has shown that mechanical profiling and force–velocity characteristics can explain a meaningful proportion of variability in spike and serve ball speeds among elite male volleyball players, implying that individualized training targeting power outputs may yield performance gains (Baena-Raya et al., 2021). Moreover, jump performance is influenced by neuromuscular coordination and technique factors, such as arm-swing contribution and force-application timing, reinforcing the importance of training interventions tailored to individual biomechanics and movement strategies (Hara et al., 2017). Given this complexity, volleyball training programs that adapt to athlete-specific profiles may offer advantages over generalized conditioning approaches.

However, personalization is not only a performance issue; it is also a safety issue. Volleyball athletes experience repetitive stress and acute injury risk due to frequent jumps, rapid directional changes, and overhead movements. Injuries can reduce team performance through player unavailability and may compromise long-term athlete health. The literature increasingly frames injury prevention as a data-driven management process, where training load monitoring and individualized exposure control are central elements (Claudino et al., 2019). In this context, AI-supported personalization has the potential to improve load distribution and recovery scheduling by continuously integrating athlete-specific risk information, potentially reducing injury incidence.

Despite the growing theoretical and technological promise of AI-driven training, empirical comparisons between AI-generated training programs and traditional coach-crafted individualized programs remain limited in many sports contexts. Many published studies emphasize prediction rather than intervention outcomes, and translating AI analytics into practical performance improvements is still developing (Reddy, 2025). Furthermore, systematic evidence indicates that implementation challenges persist, including a lack of standardization across protocols, variations in model validity, and practical barriers to deployment in real-world training environments (Reddy, 2025). These limitations reinforce the importance of applied studies that directly compare AI-driven programming to conventional coaching methods using objective metrics.

Accordingly, the present study evaluates AI-generated personalized training programs versus human-crafted programs in men's volleyball training contexts. The comparison focuses on key performance outcomes—vertical jump height improvement and serve speed improvement relative to training exposure—as well as health and competition indicators, including injury occurrence rate and team win percentage. By assessing both performance gains and injury outcomes, the study addresses a central concern in sports conditioning: whether the efficiency and scalability of AI personalization can translate into tangible athletic benefits without compromising safety. This research contributes to the emerging evidence base on AI in sports performance optimization, particularly in team sports settings where individualized management must be balanced with collective scheduling and strategic objectives.

In summary, volleyball training demands individualized intervention strategies due to the sport's biomechanical complexity and injury exposure risks. AI and ML systems offer promising capabilities to enhance training personalization through data integration, adaptive recommendations, and workload optimization (Claudino et al., 2019; Bittencourt et al., 2025). At the same time, research emphasizes that AI-based interventions require validation through outcome-focused studies, as predictive accuracy alone does not guarantee performance improvement or injury reduction (Reddy, 2025; Rossi et al., 2025). Therefore, this study examines whether AI-generated training prescriptions provide measurable advantages over human-crafted

personalization in men's volleyball, as reflected through performance metrics, injury rates, and competitive success.

2. Method

2.1 Research Design

This study used a quantitative, quasi-experimental research design to compare two approaches to personalized training for men's volleyball players: an AI-generated program and a human-crafted program. The purpose of this design was to determine which approach leads to better outcomes in both performance improvement and injury reduction, using measurable indicators important to competitive volleyball.

A quasi-experimental design was selected because the study involved real teams and real training environments, where random assignment of players to groups was not fully practical. Instead, the study compared two groups that were already organized for training: one followed a training plan generated by artificial intelligence, while the other followed a training plan designed by coaches and human experts. Even though the groups were not randomly assigned, both were treated as comparable and assessed using the same procedures and outcome measures to ensure fairness in the comparison.

The study focused entirely on numerical data, meaning all outcomes were measured objectively rather than based on opinion. To evaluate effectiveness, the research examined changes in vertical jump height and serve speed, as these are key performance markers in volleyball. Jump height was measured using a Vertec device, while serve speed was measured using a radar gun. To understand whether improvements were linked to training effort, the study also monitored and compared total training hours logged by each group throughout the program.

In addition to performance outcomes, the study also examined injury occurrence, as training programs must not only improve athletic ability but also protect athletes from physical harm. Injury rates were computed from recorded injuries and total athlete exposure hours, enabling comparison between the AI and human-crafted groups. Lastly, the study included a competitive indicator, team win percentage, to explore whether improvements in training translated into better match results.

Overall, the research design enabled the study to test two training methods in a realistic setting, with clear, measurable outcomes. By combining performance measures, injury records, training exposure, and win percentage, the design provided a well-rounded comparison of how AI-generated and human-designed personalized training programs influence men's volleyball performance and safety.

2.2 Participants

The participants of this study were male volleyball players who were actively training and competing in organized team settings. They were selected because the research specifically aimed to examine how personalized training—whether generated through artificial intelligence or developed by human coaches—affects performance outcomes and injury occurrence in men's volleyball. The players involved were part of training groups based in Dagupan City, Ilocos Region, Philippines, and represented individuals who regularly participated in volleyball practices, conditioning sessions, and competitive matches. A total of approximately 300 players were included in the study and were divided into two groups for comparison. One group followed a personalized training program generated by artificial intelligence, while the other followed one crafted by human experts and coaches. All participants were evaluated using the same procedures, and their progress was monitored using objective performance measures such as vertical jump height and serve speed, along with training exposure and injury records, to ensure the comparison between the two training approaches was as fair and realistic as possible.

2.3 Instrumentation

The study used reliable but straightforward tools to measure the players' performance and track their progress throughout the training period. To assess vertical jump performance, the researchers used a Vertec jump measurement device, which allowed athletes to perform a jump test and record their jump height improvement after following their assigned training program. To measure serve speed, a radar gun was used to capture how fast each player could serve, enabling comparisons of improvements in serve velocity between the AI-based and human-crafted training groups. In addition to these performance tools, the study also relied on training logs to monitor the number of hours each group spent in training, since training exposure was important in understanding whether improvements were connected to practice time. To document safety outcomes, injury records or medical reports were used to track the number and type of injuries that occurred during the study, which helped the researchers compute injury rates based on athlete exposure hours. Lastly, team performance was evaluated using match and competition records, where win percentages were computed to determine whether the training programs contributed to improved outcomes in actual games. Overall, these instruments were chosen because they are practical, widely used in sports settings, and provide objective data that can clearly show differences between the two training approaches.

2.4 Data Analysis

The data gathered in this study were analyzed using straightforward statistical methods to determine whether the AI-generated training program produced different results compared with the human-crafted training program. After collecting performance scores, training exposure hours, injury records, and match outcomes, the researchers first summarized the data using descriptive statistics, such as the mean and standard deviation, to show the average improvement for each group clearly. To identify whether the differences between the two groups were statistically meaningful, the study used an independent-samples t-test to compare the average improvements in vertical jump height and serve speed, since these outcomes were measured as continuous numerical values. For safety and competition outcomes, the researchers used a z-test for proportions to compare injury occurrence rates and win percentages between the AI and human-crafted groups. All tests were interpreted using a standard level of significance, meaning the differences were considered significant when the probability value (p-value) was below the accepted threshold. Through this approach, the analysis allowed the study to objectively determine whether the AI-based personalized training program led to better performance gains, fewer injuries, and stronger competitive results than the training program developed by human coaches.

3. Results

The results of the study showed that the AI-generated personalized training program produced better overall outcomes than the human-crafted program, both in performance improvements and in athlete safety. In terms of vertical jump height, the players who followed the AI-based training plan improved more, with an average gain of 4.6 cm, while those in the human-designed program improved by 3.2 cm. This difference was found to be statistically significant, indicating that the improvement seen in the AI group was not due to chance. The same pattern was observed for serve speed, with the AI group recording an average improvement of 3.2 km/h compared with 1.9 km/h for the human-crafted group. Even though both groups accumulated almost the same number of training hours, the AI group still showed a stronger increase in serve speed, suggesting that the training program was more efficient or better suited to individual athlete needs. Beyond performance, the study also found that the injury rate was lower in the AI group,

with fewer injuries per 1000 athlete-hours than in the control group. This indicates that AI personalization may have helped manage training load more effectively and reduce risk factors that often lead to injury. Lastly, when it came to team success, the AI-trained group showed a larger improvement in win percentage, rising from 62.5% to 75.0%, while the human-crafted group rose from 60.0% to 65.0%. Overall, these results suggest that AI-based personalized training not only improved physical performance indicators, such as jumping and serving, but also supported better injury outcomes and stronger competitive performance for men's volleyball teams.

4. Discussion

To gather accurate, measurable data, the study used practical testing tools commonly used in sports performance monitoring. First, the researchers measured the athletes' vertical jump height using a Vertec jump measurement device. The Vertec is widely used in volleyball and other jumping sports because it is portable, easy to set up, and provides a direct and reliable way to record jump height based on how high the athlete can reach during a maximal jump attempt (Science for Sport, 2025). Research comparing jump-measuring tools has also noted that Vertec-based measures can serve as a reliable field method for assessing vertical jump performance and tracking improvements over time (Balsalobre-Fernández et al., 2018). In the context of this study, the Vertec allowed the researchers to clearly observe whether the AI-generated training group improved their jumping capacity more than the human-crafted training group.

To measure serve speed, the study used a radar gun, a standard instrument for measuring ball velocity in sports. Radar guns use Doppler radar principles, making them useful for providing immediate, objective feedback on how fast an object—such as a volleyball serve—is traveling (Koechlin et al., 2024). Because serve speed is a meaningful indicator of volleyball performance and offensive pressure, the radar gun helped quantify whether training interventions translated into stronger serving output. Radar-based monitoring has been recognized as a practical method for evaluating strike and serve velocity in volleyball testing protocols, especially because it allows coaches and researchers to monitor performance changes with clarity and consistency (Testing Protocol for Monitoring Spike and Serve Speed in Volleyball, n.d.).

Aside from direct performance testing, the study also relied on training logs to track the amount of time athletes spent training. These logs were important because training exposure helps explain whether performance changes were linked to the quality, quantity, or both of training. Training load monitoring—often based on session duration and intensity—is widely recognized as a key part of managing adaptation, avoiding overtraining, and reducing injury risk (Halson, 2014). Recent research continues to support the idea that tracking training load through recorded session data is essential for evaluating training effectiveness and keeping athletes within a safe workload range (Frontiers in Neuroscience, 2024). In this study, the training logs enabled comparisons of improvements in jump height and serve speed while accounting for training hours, ensuring the analysis was not based solely on performance changes.

To document and evaluate player safety, the study used injury records (such as medical reports or team injury documentation) to determine the number of injuries during the training period. These records were then used to compute injury rates based on exposure time, a widely accepted approach in sports injury research. Standard injury surveillance practice recommends reporting injury incidence as an incidence rate (e.g., injuries per 1000 hours of athlete exposure) to allow fair comparison of injury risk between groups and across studies (Bahr et al., 2020). Using this method, the study determined whether AI-based training had an advantage over a human-designed program in reducing injury occurrence.

Lastly, the study used match and competition records to compute the teams' win percentages. This instrument was included to measure whether improvements in training outcomes translated into better results in actual competition. By using win percentage, the study

connected training effectiveness not only to physical performance improvements but also to real-world team success, making the findings more meaningful for practical volleyball coaching and competitive preparation.

Overall, the instruments used in the study were selected because they are realistic for sports settings, widely accepted, and capable of producing objective numerical data. Together, the Vertec, radar gun, training logs, injury documentation, and match records provided a balanced way to measure athlete performance, training exposure, injury occurrence, and competitive results.

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