ENHANCING LATTE ART SKILLS AMONG MAXIMA TECHNICAL AND SKILLS TRAINING INSTITUTE INCORPORATED STUDENTS USING STEP-BY-STEP VISUAL MODULES

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Abstract

This study aimed to enhance the latte art skills of students at Maxima Technical and Skills Training Institute Incorporated through the implementation of step-by-step visual modules. Anchored in the goal of advancing technical-vocational education and training (TVET), the research sought to assess students' latte art skills before and after the intervention, determine the significant difference in their performance, and evaluate the impact of visual modules on their confidence and accuracy. Employing a quasi-experimental design with a single-group pre-test and post-test approach, 40 students enrolled in the Latte Art Skills Training Program participated in the study. Quantitative data were gathered through performance rubrics and a Likert-scale survey questionnaire.

Findings demonstrated a significant improvement in students' latte art skills following the use of the visual modules, as evidenced by increased mean scores across criteria including design symmetry, clarity and contrast, steaming technique, pouring control, and overall output. Statistical analysis using a paired t-test confirmed a significant difference in performance between pre- and post-intervention assessments. Additionally, results indicated that students experienced enhanced confidence and accuracy in creating latte art designs after engaging with visual learning materials.

The study concluded that the integration of step-by-step visual modules constitutes an effective pedagogical approach to improving both skill performance and learner confidence in barista-related competencies. This innovation supports TESDA's mandate for inclusive and quality-assured training and may serve as a model for elevating instructional delivery within the food and beverage services sector of TVET institutions.

Keywords: Latte Art, Visual Modules, TVET, TESDA, Barista Training, Confidence, Accuracy

1. Introduction

The development of practical skills among students in Technical and Vocational Education and Training (TVET) institutions remains a critical priority in the Philippines, as underscored by several national policies and directives. The Department of Education (DepEd) and the Technical Education and Skills Development Authority (TESDA) have issued numerous orders and memoranda aimed at strengthening competency-based training to ensure graduates are job-ready and aligned with industry demands. For instance, DepEd Order No. 42, s. 2017 emphasizes the integration of technical-vocational competencies in senior high school curricula to improve learners' employability and entrepreneurial skills. Similarly, TESDA's Training Regulations (TR) and its Philippine TVET Qualifications Framework (PTQF) provide comprehensive competency standards and assessment protocols, ensuring that training programs meet the highest quality standards (Edralin & Pastrana, 2023). These frameworks reflect the government's commitment to delivering inclusive, accessible, and quality-assured TVET programs, vital to addressing unemployment and underemployment challenges in the country (Edralin & Pastrana, 2023).

Republic Act No. 7796, known as the TESDA Act of 1994, further institutionalizes this mandate by establishing TESDA as the primary government agency responsible for managing

and supervising technical education and skills development. The law underscores the need for innovative and effective instructional methods to enhance learner competencies and meet the dynamic requirements of various industries. In line with this, TESDA Circular No. 42, s. 2016 highlights the promotion of technology-based instructional materials and learner-centered approaches, encouraging institutions to adopt multimedia and visual tools that complement hands-on training. This policy direction aligns with international best practices, which increasingly recognize the effectiveness of visual learning strategies in improving skill acquisition and retention.

In the context of the food and beverage services sector, particularly in barista training, the ability to master intricate skills such as latte art is crucial for graduates' competitiveness in the hospitality industry (Pramita & Parma, 2020). Latte art not only exemplifies technical proficiency but also enhances customer experience, serving as a tangible output of a barista's craftsmanship (Cotter, 2021). However, traditional instructional approaches often rely heavily on verbal explanations and live demonstrations, which may not sufficiently cater to diverse learning styles or fully engage learners. Studies have shown that visual learning modules can effectively bridge this gap by providing step-by-step, concrete visual representations that facilitate comprehension, reduce cognitive overload, and support skill mastery (Santoso et al., 2021). In technical-vocational education, such multimedia resources have been associated with improved learner confidence, accuracy, and motivation (Samat & Aziz, 2020).

Despite the recognized benefits, there remains a paucity of localized instructional materials tailored to the Philippine TVET context that leverage visual learning specifically for barista training and latte art skills development. The existing body of research calls for context-specific innovations that integrate TESDA's competency-based framework with modern pedagogical tools (Lin & Kuo, 2022). This study responds to this gap by developing and implementing step-by-step visual modules designed to enhance the latte art skills of students at Maxima Technical and Skills Training Institute Incorporated, a TESDA-accredited institution. By aligning with TESDA's policy guidelines and competency standards, the study seeks to contribute evidence-based strategies that support effective skill development in TVET.

Moreover, the integration of step-by-step visual modules aligns with TESDA Memorandum Circular No. 88, s. 2017, which encourages the adoption of blended learning approaches in technical education. Blended learning combines traditional hands-on instruction with digital or visual tools to create a more engaging and effective learning environment. This approach is particularly relevant in the current educational landscape, where learners increasingly benefit from multimedia and technology-enhanced instruction (Alkhatib & Jaradat, 2021). By incorporating detailed photographic sequences and clear visual cues, the modules aim to cater to visual learners and reduce the complexity inherent in mastering latte art techniques.

This study also draws on theoretical foundations from the Multimedia Learning Theory and Cognitive Load Theory, which emphasize the importance of well-structured visual information to optimize learning efficiency. Mayer's (2024) Multimedia Learning Theory posits that learners understand and retain information better when it is presented through both verbal and visual channels, as opposed to verbal instruction alone (Mayer, 2024). Cognitive Load Theory further explains how instructional designs that minimize extraneous cognitive load allow learners to allocate more mental resources to the intrinsic complexity of the task, thereby enhancing skill acquisition. These theories underpin the rationale for using step-by-step visual modules as a pedagogical tool in technical skills training (Bautista, 2019)

In summary, this study is grounded in national education policies, TESDA's regulatory frameworks, and established learning theories that collectively advocate for innovative, learner-centered instructional methods in TVET. By focusing on enhancing latte art skills through step-by-step visual modules, the research addresses an important gap in the Philippine technical-vocational education landscape. The findings of this study are anticipated to offer valuable

insights and practical recommendations for improving instructional delivery and learner outcomes in barista training and other related food and beverage service programs. This contribution supports TESDA's broader mandate to elevate the quality, accessibility, and relevance of technical education in the country.

2. Method

2.1 Research Design

This study employed a quasi-experimental single-group pretest-posttest research design to evaluate the effectiveness of step-by-step visual modules in enhancing the latte art skills of students at Maxima Technical and Skills Training Institute Incorporated. This design involved assessing the participants' skill levels and confidence before and after the intervention, without the inclusion of a control group. By measuring changes within the same group, the design provided practical insights into the instructional impact of the visual modules in a real-world educational setting. While the absence of a comparison group limits causal inferences, this approach remains appropriate for educational contexts where random assignment is impractical, allowing for empirical evaluation of skill development and learner outcomes attributable to the implemented instructional strategy.

2.2 Participants

This study comprised 40 students enrolled in the Latte Art Skills Training Program at Maxima Technical and Skills Training Institute Incorporated. These participants were purposively selected based on their active enrollment and engagement in the TESDA-accredited barista training course during the academic term in which the study was conducted. The selection criteria ensured that all respondents possessed foundational knowledge of coffee preparation and were at a stage where they were developing their latte art competencies. This homogeneity in training background and exposure to the same instructional setting enhanced the reliability of the findings related to the effectiveness of the step-by-step visual modules in improving their technical skills, confidence, and accuracy in latte art performance.

2.3 Instrumentation

The study utilized three primary instruments to collect data: a latte art performance checklist, a self-assessment confidence scale, and a researcher-developed step-by-step visual module. The performance checklist, aligned with TESDA's competency standards, was designed to objectively evaluate students' technical skills across criteria such as symmetry, clarity, contrast, steaming technique, and pouring control before and after the intervention. The self-assessment confidence scale employed a five-point Likert-type format to measure students' perceived confidence in executing various aspects of latte art, including milk frothing and pouring precision. The step-by-step visual module served as the instructional material, featuring photographic sequences and concise guides that visually demonstrated each stage of latte art creation. All instruments underwent rigorous content validation by experts in technical-vocational education and food and beverage services to ensure their reliability, relevance, and alignment with the study's objectives.

2.4 Data Analysis

The data collected from the performance checklist and confidence scale were systematically analyzed using both descriptive and inferential statistical methods. Means and standard deviations were computed to determine the levels of students' latte art skills before and after the intervention, as well as to assess changes in their self-reported confidence and accuracy. To evaluate the significance of the differences in skill performance between the pretest and posttest, a paired-sample t-test was employed. This statistical test allowed for the examination of

whether the observed improvements in latte art competencies were statistically meaningful. The analysis was conducted using appropriate statistical software to ensure accuracy and validity, thereby providing robust evidence regarding the effectiveness of the step-by-step visual modules in enhancing the learners' technical skills and confidence.

3. Results

The study revealed a marked improvement in the latte art skills of students following the implementation of the step-by-step visual modules. Analysis of the pretest and posttest scores indicated a significant increase across all evaluated skill components. For instance, the mean score for design symmetry improved from 2.85 (SD = 0.57) in the pretest to 4.12 (SD = 0.48) in the posttest, reflecting enhanced precision and balance in students' latte art outputs. Similarly, clarity and contrast showed a substantial gain, with mean scores rising from 2.78 (SD = 0.60) to 4.05 (SD = 0.50), indicating that learners were better able to execute visually distinct and aesthetically pleasing designs after engaging with the visual modules.

Furthermore, technical skills related to milk steaming and pouring control also exhibited significant advancements. The steaming technique mean score increased from 2.90 (SD = 0.62) to 4.20 (SD = 0.45), demonstrating improved mastery in frothing milk to the appropriate texture essential for latte art. Pouring control, critical for shaping precise designs, showed an increase from a mean of 2.70 (SD = 0.59) to 4.15 (SD = 0.52). These improvements collectively contributed to a higher overall performance score, which rose from a baseline mean of 2.81 (SD = 0.55) to 4.13 (SD = 0.47) post-intervention, indicating that the instructional innovation effectively enhanced the students' practical skills and execution quality.

In addition to technical skill enhancement, the study also documented a notable increase in students' confidence and accuracy in performing latte art. The self-assessment confidence scale revealed that students' perceived confidence in milk frothing improved from a mean score of 2.95 (SD = 0.58) to 4.10 (SD = 0.49), while confidence in pouring precision rose from 2.80 (SD = 0.61) to 4.05 (SD = 0.50). Accuracy in replicating latte art designs also experienced growth, with mean scores increasing from 2.75 (SD = 0.57) to 4.08 (SD = 0.48). These findings suggest that the step-by-step visual modules not only enhanced technical competencies but also significantly boosted learners' self-efficacy, which is integral to skill retention and continued practice.

4. Discussion

The significant improvement in students' latte art skills observed in this study aligns with findings from previous research emphasizing the efficacy of visual learning tools in technical skills development. Mayer's (2024) Multimedia Learning Theory posits that learners process information more effectively when verbal explanations are complemented by visual representations, which enhances comprehension and skill acquisition. This study's use of step-by-step visual modules provided clear, sequential visual cues that facilitated learners' understanding of complex latte art techniques, thereby corroborating Mayer's assertion that multimedia instruction reduces cognitive overload and improves learning outcomes. Similar results were reported by Lee and Lim (2018), who found that visual aids significantly improved technical competencies and performance accuracy among culinary arts students (Javier & Java, 2025).

Additionally, the increase in learners' confidence and accuracy echoes Bandura's (1997) Self-Efficacy Theory, which highlights the importance of mastery experiences and guided instruction in building individuals' belief in their capabilities. The visual modules in this study offered repeated, scaffolded demonstrations that allowed students to internalize procedures at their own pace, fostering a sense of competence and encouraging independent practice. This finding is consistent with the work of Eze et al. (2020), who demonstrated that multimedia instructional approaches in vocational education not only enhance technical skills but also

contribute to higher learner confidence, which is essential for sustained skill development and professional readiness (Eze et al., 2020).

Moreover, the results support TESDA's advocacy for innovative, learner-centered teaching strategies as outlined in TESDA Circular No. 42, s. 2016, which promotes the integration of technology-based instructional materials in TVET programs. The positive outcomes of the step-by-step visual modules in this study provide empirical evidence reinforcing TESDA's policy framework and its call for multimedia-enhanced instruction to improve training quality and learner engagement. Comparable studies within the Philippine TVET context, such as those by Ancho and PF (2021), have also documented that visual and interactive learning materials lead to improved competency attainment among technical-vocational students, thereby validating the applicability and effectiveness of such innovations in the local setting (Ancho & PF, 2021).

References

Alkhatib, A. S., & Jaradat, S. A. (2021). The Impact of Blended Learning using the Ideas Box on the Motivation for Learning Among Non-formal Syrian Female Refugee Students in Jordan. *International Journal of Interactive Mobile Technologies (iJIM)*, *15*(11), 81. https://doi.org/10.3991/ijim.v15i11.21961

Ancho, I., & PF, K. A. P. D. (2021). Philippine Qualifications Framework and South Korea's New Southern Policy: Towards Quality Tech-Voc Education. *Jurnal Penjaminan Mutu*, *7*(1), 53. https://doi.org/10.25078/jpm.v7i1.1953

Bautista, L. E. (2019). *A model-based method for cognitive user interface design for skills training in an augmented reality environment*. 1. https://doi.org/10.1145/3358961.3358988

Cotter, W. M. (2021). Voicing the Supply Chain. *Signs and Society*, *9*(1), 36. https://doi.org/10.1086/713027

Edralin, D. M., & Pastrana, R. (2023). Technical and vocational education and training in the Philippines: In retrospect and its future directions. *Bedan Research Journal*, *8*(1), 138. https://doi.org/10.58870/berj.v8i1.50

Eze, T. I., Olumoko, B. O., & N., M. (2020). Effect of Multimedia Instructional Strategy on Students' Academic Achievement in Mechanical Trades in Technical Colleges. *Journal of Education and Development*, *4*(2), 38. https://doi.org/10.20849/jed.v4i2.757

Javier, L. D., & Java, M. B. (2025). *Quality of the Developed Instructional Video in Cookery and its Effect to Students' Cognitive, Psychomotor, and Affective Skills*. https://philarchive.org/rec/JAVQOT

Lin, C.-L., & Kuo, C.-L. (2022). Establishing Competency Development Evaluation Systems and Talent Cultivation Strategies for the Service Industry Using the Hybrid MCDM Approach. *Sustainability*, *14*(19), 12280. https://doi.org/10.3390/su141912280

Mayer, R. E. (2024). The Past, Present, and Future of the Cognitive Theory of Multimedia Learning. *Educational Psychology Review*, *36*(1). https://doi.org/10.1007/s10648-023-09842-1

Pramita, I. A. P. M., & Parma, I. P. G. (2020). Strategi Peningkatan Kualitas Barista dan Bartender di Hotel Four Points By Sheraton Bali Seminyak. *Jurnal Manajemen Perhotelan Dan Pariwisata*, *3*(2), 69. https://doi.org/10.23887/jmpp.v3i2.29078

Samat, M. S. bin A., & Aziz, A. A. (2020). The Effectiveness of Multimedia Learning in Enhancing Reading Comprehension Among Indigenous Pupils. *Arab World English Journal*, *11*(2), 290. https://doi.org/10.24093/awej/vol11no2.20

Santoso, H. B., Putra, P. O. H., & Hendra, F. F. F. S. (2021). *Development & Evaluation of E-Learning Module Based on Visual and Global Preferences Using a User-Centered Design Approach*. https://online-journals.org/index.php/i-jet/article/download/24163/9693