

INTERACTIVE RECIPE CARDS AS AN INSTRUCTIONAL TOOL IN TEACHING COOKERY TO GRADE 11 LEARNERS

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Abstract

This study explored the effectiveness of interactive recipe cards as an instructional tool in teaching Cookery to Grade 11 learners at Ignacio Villamor High School. Anchored on the Constructivist Learning Theory, Experiential Learning Theory, and other relevant frameworks, the research aimed to determine the level of learners' performance in Cookery before and after using interactive recipe cards, the significant difference in their performance, perceptions of learners toward the instructional tool, and the challenges encountered during its implementation. A quasi-experimental design, particularly the one-group pretest-posttest approach, was employed. The participants comprised 50 Grade 11 students from the Technical-Vocational-Livelihood (TVL) strand. Research instruments included a researcher-made pretest and posttest to assess performance levels and a survey questionnaire to capture perceptions and challenges.

Findings revealed a marked improvement in students' performance after the intervention, with a statistically significant difference observed between pretest and posttest scores using a dependent t-test. Most learners had positive perceptions, noting that the interactive recipe cards enhanced engagement, comprehension, and retention of cooking procedures. Despite minor challenges such as digital access limitations and navigation issues, learners preferred the interactive format over traditional recipe handouts. The study concluded that interactive recipe cards are a valuable instructional innovation that can improve student outcomes in practical-based subjects like Cookery. It is recommended that such tools be integrated into TVL programs to support 21st-century skills development and learner-centered pedagogy.

Keywords: Interactive recipe cards, Cookery instruction, Grade 11 learners, TVL track, instructional tool, learner performance, educational technology

1. Introduction

In recent years, the Philippine Department of Education (DepEd) has been steadfastly advancing technical-vocational education to equip learners with relevant 21st-century competencies (Javier & Java, 2025). Anchored in Republic Act No. 10533, also known as the Enhanced Basic Education Act of 2013, the K-12 reform mandated the integration of the Technical-Vocational-Livelihood (TVL) track in senior high school to ensure skill-based curriculum aligns with global standards. Furthermore, DepEd Order No. 37, s. 2003, along with subsequent memoranda, have emphasized the importance of Technology and Livelihood Education (TLE) in preparing students for practical, employment-ready competencies. By 2025, DepEd's continued issuance of orders—such as DM No. 245, s. 2025—demonstrates sustained efforts to enhance the delivery quality of the TVL program and uphold its relevance.

The TVL track includes Cookery as part of Home Economics under the K-12 curriculum, designed to lead students toward National Certificate II (NC II) standards set by TESDA. Learners are expected to acquire competencies spanning from basic kitchen hygiene to preparing a wide variety of dishes according to technical regulations (Illo, 2025). However, despite robust curricular frameworks, challenges persist in actualizing meaningful learning outcomes in practical-based subjects like Cookery (Woodhouse & Rodgers, 2024). Studies have highlighted gaps in preferred

teaching-learning modalities in TVL Cookery, revealing mismatches between instructional styles and learners' diverse modalities. Meanwhile, emergent innovations explore digital modalities—such as digitalized learning modules—that suggest positive potential for enhancing engagement and performance (Agan, 2024).

This backdrop underscores two key research gaps: (1) the need to deepen empirical understanding of how instructional innovations—specifically interactive digital tools—impact performance in Cookery; and (2) the limited evidence on learners' perceptions and the practical challenges associated with integrating such tools in resource-constrained settings (Ateş et al., 2024). Recognizing this, the present study offers a timely contribution by investigating the effectiveness of interactive recipe cards as an instructional tool in improving Grade 11 learners' performance in Cookery at Ignacio Villamor High School.

This study responds directly to DepEd's policy-driven mandate for innovative, competency-based TVL instruction. By employing a quasi-experimental, one-group pretest–posttest design, the investigation examines the degree to which interactive recipe cards affect learners' performance, their subjective perceptions, and the implementation challenges encountered. This approach not only builds on existing digital learning explorations but also addresses the practical execution of TVL reforms, aligning with Implementation Theory to assess policy-to-practice transitions.

In driving forward the field, this study aims to fill critical scholarly and practical gaps. Through quantitative performance comparisons and qualitative insights into learner experiences, it contributes evidence that may guide educators, administrators, and policymakers in enhancing TVL pedagogy with technology-based tools. The findings are expected to inform future adaptations of Cookery instruction, fostering not only competency development but also inclusive, resource-conscious implementation strategies that align with national education goals.

2. Method

2.1 Research Design

The study employed a quasi-experimental research design, specifically utilizing a one-group pretest-posttest format, to evaluate the effectiveness of interactive recipe cards as an instructional tool in teaching Cookery to Grade 11 learners. This design was deemed appropriate as it allowed the researcher to measure learners' performance before and after the intervention, thereby determining the extent of improvement attributable to the use of interactive recipe cards. In this approach, a single group of participants was given a pretest to establish their baseline knowledge and skills, followed by the instructional intervention using interactive recipe cards, and finally a posttest to assess any changes in performance. The quasi-experimental nature of the design acknowledges the absence of a control group; however, it remains robust in establishing cause-and-effect relationships in practical classroom settings where random assignment may not be feasible. This methodology aligns with the study's objective of assessing instructional innovation in a real-world educational context, making it suitable for Technical-Vocational-Livelihood (TVL) education, where skill acquisition and performance improvement are primary concerns. The design also facilitated both quantitative analysis of performance gains and qualitative exploration of learner perceptions, ensuring a comprehensive evaluation of the instructional tool's effectiveness.

2.2 Participants

The study consisted of Grade 11 learners enrolled in the Technical-Vocational-Livelihood (TVL) track, specializing in Cookery, at Ignacio Villamor High School during the academic year 2024–2025. The selection of participants was based on purposive sampling, as they were the direct beneficiaries of the instructional intervention and possessed the foundational knowledge

and skills required for the Cookery subject as stipulated in the K to 12 Curriculum Guide of the Department of Education (DepEd). These learners were chosen because they were in the stage of developing both theoretical understanding and practical competencies in various cooking methods, food preparation techniques, and kitchen safety practice skills directly addressed by the use of interactive recipe cards. The class was composed of a heterogeneous mix of students in terms of gender, academic performance, and socio-economic backgrounds, thereby reflecting the typical composition of TVL classes in public secondary schools. The total number of participants was sufficient to generate reliable data for statistical analysis while maintaining the feasibility of implementing and monitoring the intervention in a classroom setting. The participation of the learners was voluntary, and ethical considerations such as informed consent, confidentiality of responses, and the right to withdraw from the study were strictly observed throughout the research process.

2.3 Instrumentation

The study utilized three primary research instruments: a pretest, a posttest, and a survey questionnaire, all of which were developed and validated to align with the learning competencies stipulated in the Cookery curriculum under the K to 12 Senior High School Technical-Vocational-Livelihood (TVL) track. The pretest and posttest, consisting of multiple-choice and identification items, were designed to measure learners' knowledge, comprehension, and application of fundamental cooking concepts and procedures before and after the intervention using interactive recipe cards. The content validity of these tests was established through expert evaluation by subject specialists and experienced Cookery teachers to ensure alignment with DepEd standards and learning objectives. The survey questionnaire, composed of Likert-scale items and open-ended questions, was employed to gather qualitative and quantitative data on students' perceptions, engagement levels, and the perceived effectiveness of the interactive recipe cards. The combination of these instruments provided a comprehensive measure of both cognitive gains and affective responses, ensuring the study's findings were supported by robust and triangulated data.

2.4 Data Analysis

The data gathered from the pretest, posttest, and survey questionnaire were systematically organized, coded, and subjected to appropriate statistical analyses to address the research questions. Descriptive statistics, specifically the mean and standard deviation, were employed to determine the learners' performance levels in Cookery before and after the intervention using interactive recipe cards. To measure the significance of the difference in pretest and posttest scores, a dependent t-test was conducted, providing an objective basis for assessing the instructional tool's effectiveness. Additionally, frequency and percentage distributions were utilized to analyze students' perceptions of the interactive recipe cards and to identify challenges encountered during their use. This combination of descriptive and inferential statistical techniques allowed for a comprehensive interpretation of the data, ensuring that both the quantitative improvements in academic performance and the qualitative aspects of learner engagement were thoroughly examined.

3 Results

The results of the pretest revealed that the Grade 11 learners at Ignacio Villamor High School demonstrated a low level of proficiency in Cookery concepts and skills before the intervention. The computed mean score was 12.45 out of a possible 25 points, with a standard deviation of 3.18, indicating that most students scored below the mastery level prescribed in the Cookery curriculum standards. These findings suggest gaps in learners' baseline knowledge, particularly in areas such as ingredient measurement, cooking techniques, and safety procedures.

The pretest scores provided a clear diagnostic view of the learners' starting point, establishing the need for an innovative instructional approach to address these deficiencies.

Following the integration of interactive recipe cards in Cookery lessons, the posttest results showed a significant improvement in student performance. The mean score increased to 20.32 with a reduced standard deviation of 2.75, indicating not only an overall enhancement in achievement but also a more consistent performance among learners. This improvement represents a mean gain score of 7.87 points, suggesting that the use of interactive recipe cards effectively bridged the gaps identified in the pretest. The dependent t-test confirmed that the increase in scores was statistically significant at the 0.05 level, thus supporting the hypothesis that the intervention had a positive impact on learners' mastery of Cookery competencies.

In terms of learner perceptions, the survey data revealed generally favorable responses toward the use of interactive recipe cards. Most students (85%) agreed or strongly agreed that the materials enhanced their understanding of cooking procedures, while 80% reported increased motivation and engagement during lessons. Open-ended responses highlighted that the visual and step-by-step format of the recipe cards made complex cooking processes easier to follow. In contrast, others appreciated the ability to work more independently during practical activities. However, some students mentioned minor challenges, such as difficulty in interpreting certain icons or limited access to the materials outside of class hours. Overall, these results indicate that interactive recipe cards not only improved academic performance but also positively influenced learners' attitudes toward Cookery.

4 Discussion

Mayer's (2009) Cognitive Theory of Multimedia Learning posits that students learn more effectively when instructional content is presented through a combination of text and visuals, as it engages both verbal and visual processing channels. In alignment with this theory, the interactive recipe cards used in this study provided a structured, step-by-step visual representation of cooking processes, which facilitated comprehension and retention (Chen et al., 2022). Similarly, the study of Tito and Fadloeli (2021) on the use of illustrated recipe guides in Technology and Livelihood Education (TLE) found that students exhibited significant improvements in practical cooking assessments, which parallels the notable posttest gains observed in the present research.

Furthermore, the results affirm the conclusions of Navarro (2022), who explored the integration of activity-based and learner-centered tools in vocational education. Their findings revealed that such tools not only improved technical competencies but also fostered student autonomy and confidence. In the current study, learners expressed increased motivation and engagement when using interactive recipe cards, mirroring Aquino et al.'s observation that accessible and visually guided materials enable students to work more independently. This is also consistent with the principles outlined in DepEd Order No. 39, s. 2016, which encourages the use of contextualized and localized teaching materials to make learning more meaningful and relevant to students' real-life experiences.

Lastly, the positive reception of the interactive recipe cards corroborates the study of Javier and Java (2025), which examined the role of instructional scaffolding in skill-based learning. They concluded that breaking down complex tasks into manageable, guided steps significantly reduces learner anxiety and improves task performance. In a similar vein, the interactive recipe cards in this study functioned as scaffolding tools, allowing learners to follow cooking procedures with greater accuracy and confidence. Additionally, the challenges reported by some learners—such as difficulty interpreting certain icons—echo the findings of Santos and dela Cruz (2018), who noted that while visual aids are generally beneficial, their effectiveness depends on clarity, accessibility, and learner familiarity. Thus, the present study strengthens the

body of evidence supporting interactive and visual materials as effective instructional tools, particularly in skill-oriented subjects like Cookery.

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