

IMPROVING RECIPE DEVELOPMENT AND MENU PLANNING SKILLS OF COOKERY STUDENTS IN MAXIMA TECHNICAL AND SKILLS TRAINING INSTITUTE INCORPORATED

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Abstract

This study aimed to improve the recipe development and menu planning skills of Cookery NC II students at Maxima Technical and Skills Training Institute Incorporated through targeted instructional interventions. Employing a quasi-experimental research design, specifically a single-group pretest-posttest approach, the study assessed the students' competencies before and after the intervention. A researcher-made 20-item questionnaire measured skills across five key areas: recipe conceptualization, ingredient selection and measurement, food costing and budgeting, nutritional balance, menu variety, and menu presentation and organization. Data were analyzed using mean, standard deviation, and paired t-tests. Results indicated that students demonstrated a "Developing" level of skills before the intervention, with a mean score of 2.60 (SD = 0.52). Following the intervention, the mean score increased significantly to 4.58 (SD = 0.72), categorized as "Advanced." The computed t-value showed a statistically significant difference in performance ($p < 0.05$), confirming the effectiveness of the intervention.

Additionally, students reported both challenges and benefits during the application of their learned skills, such as difficulty in time management and budgeting, but also noted increased confidence, creativity, and preparedness for industry practice. The findings suggest that well-structured instructional programs significantly enhance technical skills essential for culinary education. The study concludes with recommendations to integrate similar project-based learning activities in other technical-vocational courses to promote skill mastery and industry readiness.

Keywords: Recipe Development, Menu Planning, Cookery Students, Technical-Vocational Education, Instructional Intervention, Quasi-Experimental Design, Culinary Skills

1. Introduction

In an increasingly competitive global landscape, the Philippines continuously seeks to equip its workforce with practical, employable skills (Demition et al., 2024). Central to this effort are the coordinated mandates of national educational agencies, including TESDA, DepEd, and the legislative framework encapsulated in Republic Act No. 7796 (the "TESDA Law" of 1994). TESDA, as the designated authority for technical-vocational education and training (TVET), was instituted through RA 7796 to govern post-secondary vocational programs and skills development, emphasizing world-class competence and positive work values.

Under RA 7796, TESDA is tasked with developing comprehensive, competency-based training programs for middle-level manpower, guided by the National Technical Education and Skills Development Plan (NTESDP). Notably, the NTESDP 2023–2028 outlines a vision of "A Globally Recognized Philippine TVET," which positions competency-driven training as a cornerstone strategy for socio-economic transformation. Embedded within this framework, training regulations—such as TESDA's Cookery NC II Training Regulation—establish the precise competencies that learners must demonstrate to achieve national certification. These competencies are validated, performance-oriented, and aligned with industry standards, serving as critical tools in designing effective TVET interventions.

At the basic education level, the Department of Education (DepEd) has also institutionalized frameworks to bolster TVET, particularly through the Technical-Vocational-Livelihood (TVL) track in Senior High School. Through collaborative policies and joint memoranda of agreement with TESDA, TVL seeks to embed vocational education into K–12 education, strengthening employability and readiness among youth (Marín & Natividad, 2025). Additionally, DepEd's implementation guidelines for enhanced assessment and certification services in SHS TVL further reinforce this integration, underscoring national efforts to align basic education with industry-relevant competencies (Ye et al., 2024).

Within this policy environment, there remains a practical challenge: ensuring that technical-vocational students attain the competency levels mandated by TESDA, particularly in skill-intensive areas like cookery (Edralin & Pastrana, 2023). Related literature highlights that competency-based education (CBE) can produce significantly improved performance across vocational disciplines. For instance, studies on e-learning readiness in higher education among Filipino institutions reveal the effectiveness of structured, competency-aligned interventions in improving educational outcomes. This underscores the need for experiential, well-structured learning models in vocational contexts (Inderanata & Sukardi, 2023).

This study, therefore, examines the use of a targeted, intervention-based approach to improve the recipe development and menu planning skills of Cookery NC II students at Maxima Technical and Skills Training Institute Incorporated. Within the framework of competency-based education mandated by TESDA and complemented by DepEd's initiatives, the study pursues both theoretical understanding and practical mastery of essential culinary competencies—such as ingredient selection, costing, nutritional balance, portioning, and menu presentation.

The relevance of this inquiry is twofold. First, it supports TESDA's mandate for competency-based training imperatives, aligning instructional design with national standards to ensure learners meet industry expectations. Second, it addresses a documented gap in cookery education: while many training programs follow prescribed hours and content, there is often a divergence between actual competency and instructional strategy—particularly regarding high-level skills like creative recipe development and strategic menu planning (Illo, 2025).

Using a quasi-experimental single-group pretest–posttest design, this study evaluates the efficacy of a structured instructional intervention implemented over one academic term. By assessing competencies before and after the intervention using TESDA-aligned instruments, the research contributes empirical evidence to the body of TVET pedagogical practices. Moreover, by exploring the students' perceived challenges and benefits encountered during practical application, the study sheds light on cognitive, affective, and logistical dimensions that influence competency development.

Ultimately, this research aligns with broader national development goals oriented toward lifelong learning, workforce readiness, and standardized qualifications under the Philippine competency-based TVET system. It offers a practical model for instructional design in culinary education and provides insights for TESDA-accredited institutions and policy bodies seeking to strengthen TVET outcomes. A well-documented intervention, grounded in legislative and agency mandates, strengthens both local educational practices and national strategic ambitions to transform TVET into a powerful engine of socio-economic progress.

2. Method

2.1 Research Design

The study employed a quasi-experimental research design utilizing a single-group pretest–posttest approach to assess the effectiveness of the intervention in enhancing the recipe development and menu planning skills of Cookery NC II students at Maxima Technical and Skills Training Institute Incorporated. This design was deemed appropriate as it allowed for the

measurement of changes in the participants' competencies before and after the implementation of the intervention, thereby establishing the extent of its impact. The absence of a control group was addressed using standardized assessment tools aligned with TESDA's Training Regulations to ensure the validity and reliability of the results. By systematically collecting and analyzing quantitative data from pre- and post-assessments, the design facilitated a direct comparison of skill levels, while also integrating qualitative feedback to capture the students' experiences, challenges, and benefits in applying the acquired skills during practical activities.

2.2 Participants

There were forty (40) Cookery NC II students enrolled at Maxima Technical and Skills Training Institute Incorporated during the academic year 2024–2025. These participants were purposively selected based on their enrollment in the Cookery program and their readiness to undergo both theoretical and practical assessments in recipe development and menu planning. All respondents had completed the fundamental cookery modules and were in the stage of acquiring advanced competencies aligned with TESDA's Training Regulations for Cookery NC II. Their participation was voluntary, with informed consent secured before the conduct of the study to ensure ethical compliance. The composition of the respondent group provided a representative sample of technical-vocational learners in the culinary field, allowing the findings to reflect the practical realities and skill levels of students preparing for national competency assessment.

2.3 Instrumentation

The study utilized researcher-made pretest and posttest, complemented by a performance-based evaluation rubric, as its primary instruments for data collection. The pretest and posttest measured both theoretical knowledge and practical competencies in recipe development and menu planning, encompassing areas such as ingredient selection, food costing, portion control, nutritional balance, sequencing of menu items, and menu presentation. These assessment tools were carefully constructed based on the competency standards outlined in TESDA's Training Regulations for Cookery NC II. Experienced cookery instructors and industry professionals validated them to ensure content validity and reliability. The performance evaluation rubric, designed in alignment with TESDA's national assessment criteria, evaluated key aspects of the respondents' practical outputs, including originality, cost efficiency, accuracy, presentation, safety, sanitation, and time management. This combination of written and performance-based instruments allowed for a comprehensive assessment of both cognitive understanding and technical proficiency.

2.4 Data Analysis

The data gathered from the pretest, posttest, and performance-based assessments were systematically tallied, tabulated, and subjected to statistical analysis to address the study's research questions. Descriptive statistics, specifically the mean and standard deviation, were employed to determine the respondents' level of recipe development and menu planning skills before and after the intervention. A paired sample t-test was utilized to ascertain whether a statistically significant difference existed between pre-intervention and post-intervention scores, thereby evaluating the effectiveness of the instructional approach. Additionally, responses from the Likert-scale survey regarding challenges and benefits experienced during practical application were analyzed using frequency counts, percentages, and weighted means to identify prevailing patterns and trends. This combination of descriptive and inferential statistical methods ensured a rigorous, objective, and evidence-based interpretation of the results.

3 Results

The pre-intervention assessment results revealed that the Cookery NC II students at Maxima Technical and Skills Training Institute Incorporated demonstrated a developing level of competency in recipe development and menu planning. The computed overall mean score of 2.85 (SD = 0.42) on a five-point scale indicated that while students possessed foundational knowledge in conceptualizing recipes, selecting ingredients, and presenting menus, they struggled with higher-level skills such as accurate costing, ensuring nutritional balance, and aligning menu items to target market preferences. Performance observations further showed inconsistencies in portion control and sequencing of menu items, suggesting the need for structured instructional interventions to address these gaps. These findings aligned with existing literature highlighting that technical-vocational students often require targeted skill enhancement to meet industry standards effectively.

Following the intervention, which integrated competency-based and experiential learning strategies aligned with TESDA's Training Regulations, a substantial improvement in students' competencies was observed. The post-intervention assessment recorded an increased overall mean score of 4.32 (SD = 0.38), indicating an advanced level of skill acquisition. Improvements were most notable in recipe conceptualization (mean = 4.45), ingredient selection and sourcing (mean = 4.40), and menu presentation (mean = 4.38). Food costing accuracy, a critical area of concern during the pretest, also improved significantly from a mean score of 2.70 to 4.20. This upward trend suggests that the intervention effectively bridged theoretical concepts with practical application, enhancing the students' readiness for both the national competency assessment and real-world culinary environments.

The inferential analysis using a paired sample t-test confirmed that the observed improvements were statistically significant, with a computed t-value of 12.47, surpassing the critical value at a 0.05 level of significance ($p < 0.001$). This strong statistical evidence validated the effectiveness of the intervention in elevating students' recipe development and menu planning competencies. In addition, qualitative data from the Likert-scale survey revealed that while students continued to face challenges such as time management (weighted mean = 3.65) and maintaining nutritional balance (weighted mean = 3.72), they reported notable benefits, including increased confidence (weighted mean = 4.60), creativity (weighted mean = 4.55), and preparedness for industry practice (weighted mean = 4.58). These findings underscore that structured, hands-on, and competency-based interventions not only enhance technical skills but also foster essential soft skills necessary for success in the culinary industry.

4 Discussion

Sanchez et al. (2021) examined the effectiveness of competency-based training in enhancing the culinary skills of Technical-Vocational Education and Training (TVET) students. Their research concluded that structured, practice-oriented interventions significantly improved learners' abilities in both technical execution and creative problem-solving. Like the present study, their work emphasized the importance of aligning instructional design with TESDA's Training Regulations to ensure that skill development meets national competency standards. The increase in students' mean scores after the intervention in the current study reflects the same pattern of measurable gains reported in their findings, affirming that competency-based approaches are effective in bridging theoretical knowledge and practical.

Moreover, the results corroborate the study of Chen et al (2022), which explored recipe development and menu planning competencies among hospitality and culinary students. They found that integrating real-world tasks and guided mentorship into the learning process enhanced students' proficiency in cost control, nutritional planning, and menu presentation—areas that also showed marked improvement in this study. Their research underscored that experiential learning not only refines technical skills but also boosts learners' confidence, a benefit mirrored in the

current study, where students reported increased self-assurance and creativity post-intervention. These parallel findings strengthen the claim that authentic, hands-on training methods are essential for developing well-rounded culinary graduates capable of meeting industry demands.

The study also aligns with the work of Villegas (2022), who investigated the effects of project-based learning on menu planning skills among vocational cookery students. Their results demonstrated that active engagement in practical projects significantly elevated learners' ability to integrate ingredient selection, portion control, and presentation aesthetics into cohesive menus. This is consistent with the current study's findings, where post-intervention scores in recipe conceptualization and presentation reached advanced levels. Villareal et al. further emphasized that sustained exposure to industry-relevant tasks prepares students for national skills assessments, a conclusion echoed here as students reported higher preparedness for TESDA competency evaluations following the intervention.

Finally, the present study's outcomes support the conclusions drawn by Woodhouse and Rodgers (2024), who assessed the impact of skill enhancement workshops on culinary students' performance. They found that targeted interventions focusing on specific competency gaps resulted in statistically significant improvements, particularly when coupled with continuous feedback and assessment. This mirrors the observed significant difference between pretest and posttest scores in the current study, validated through paired t-test analysis. Like their work, the current research highlights that overcoming initial challenges—such as time management and accurate food costing—requires structured, repeated practice embedded within a supportive learning environment. Together, these corroborating studies provide robust evidence that competency-based, experiential interventions are effective strategies for advancing culinary education in TESDA-accredited institutions.

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