

ENHANCING PRODUCT QUALITY IN BREAD AND PASTRY PRODUCTION THROUGH STRUCTURED PEER ASSESSMENT AND FEEDBACK

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Abstract

This study evaluated the effectiveness of structured peer assessment and feedback in enhancing the product quality of Bread and Pastry Production among students at Maxima Technical and Skills Training Institute, Inc. Employing a quasi-experimental single-group design, the research involved 40 student-respondents. It assessed the level of product quality before and after the intervention, determined significant differences in performance, and explored its effect on learners' motivation and confidence. Data was gathered through product quality evaluations based on standardized criteria, analyzed using paired t-test for quantitative results, and thematic analysis for qualitative feedback. Findings revealed that prior to the intervention, students exhibited moderate product quality, which significantly improved after the implementation of structured peer assessment and feedback, as confirmed by statistical analysis. Qualitative results further indicate positive impacts on learners' motivation and confidence, highlighting enhanced self-reflection, collaborative learning, and skill development. These outcomes suggest that integrating structured peer assessment and feedback as a learner-centered strategy in Bread and Pastry Production can effectively strengthen technical competencies and foster positive affective outcomes. The study recommends the adoption of such assessment approaches in technical-vocational education to better prepare students for employment and entrepreneurship in the food production industry.

Keywords: Structured Peer Assessment, Feedback, Product Quality, Bread and Pastry Production, Technical-Vocational Education, Learner Motivation, Quasi-Experimental Design

1. Introduction

The educational landscape of the Philippines places increasing emphasis on aligning basic education with industry-ready competencies, as evident in the K–12 curriculum's integration of the Technical-Vocational-Livelihood (TVL) strand. Enacted through the Enhanced Basic Education Act of 2013 (Republic Act No. 10533), this reform introduced Senior High School (Grades 11–12) and institutionalized work immersion to enhance learners' technical skills and readiness for employment. Within this reform context, the Department of Education (DepEd) further strengthened technical-vocational education through key issuances such as DepEd Order No. 67, s. 2012, which promulgated the Strengthened Technical-Vocational Education Program (STVEP) and the Technology and Livelihood Education (TLE) curriculum—both aimed at equipping students with practical capacities for the 21st-century workplace.

Complementing the basic education reforms, the Technical Education and Skills Development Authority (TESDA) serves as the national authority for technical vocational education and training (TVET), mandated by Republic Act No. 7796 (Technical Education and Skills Development Act of 1994) to develop “world-class competence and positive work values” among Filipino learners. TESDA's Philippine TVET Qualification and Certification System (PTQCS) provides the framework for competency-based training and assessment, ensuring learners meet industry-validated performance standards through objective evidence collection.

These dual systems—DepEd’s TVL strand and TESDA’s competency-based approach—form the regulatory and educational backbone supporting practical subjects such as Bread and Pastry Production under the NC II qualification.

However, translating policy into effective classroom practice remains challenging. Current literature underscores the need for instructional strategies that cultivate both technical mastery and learner engagement. For instance, a recent study on TVL teachers’ instructional skills revealed that competency in pedagogical delivery, assessment, and classroom management varied across practitioners—suggesting an imperative for professional development in teaching non-academic subjects. Moreover, peer-assessment models—particularly collaborative formative assessment—are gaining recognition for enhancing skill acquisition and reflective learning in diverse educational settings. Peer assessment not only promotes critical appraisal but also facilitates metacognitive awareness, a dimension less explored in the Philippine TVL context, especially amid hands-on subjects where formative feedback is critical for progressive improvement.

In international settings, studies such as those exploring technology-enhanced peer assessment in tertiary statistics courses highlight how structured peer evaluation fosters motivation and preparedness for new content. Although these contexts differ from TVL learning environments, the underlying mechanisms—peer interaction, feedback loops, and learner involvement—are transferable and potentially impactful. Locally, while few studies have explicitly tested peer assessment in technical-vocational subjects, the theoretical alignment with competency-based education suggests it may reinforce both performance and affective outcomes, such as confidence and motivation.

Collectively, the policy environment and literature thus point to peer assessment and feedback as promising strategies to fill the gap between regulatory competency frameworks and classroom implementation. The Department of Education’s curriculum reforms and TESDA’s competency standards establish a solid foundation for technical-vocational education; yet, they do not prescribe mechanisms for formative, peer-oriented assessment within practical subjects. Given the centrality of bread and pastry production in culinary arts and food service training, enhancing learners’ output quality demands instructional strategies that engage learners both cognitively and affectively.

This study, therefore, investigates the effectiveness of structured peer assessment and feedback in enhancing product quality among students enrolled in Bread and Pastry Production (TLE/TVL track) at Maxima Technical and Skills Training Institute, Inc. — an educational setting already aligned with DepEd’s TVL curriculum and TESDA’s NC II standards, and where assessment rubrics based on competency benchmarks are practice-ready. By employing a quasi-experimental single-group pretest–posttest design, the study measures improvements in product quality and explores changes in student motivation and confidence.

Framed within this policy and research context, the study aligns with the Philippine Qualifications Framework (PQF), which underscores the recognition of knowledge, skills, and values across learning settings and institutions, and seeks to bridge education, training, and employability. By examining structured peer feedback’s role in producing more consistent and higher-quality outputs, as well as its influence on affective factors, the research contributes to a nuanced understanding of how learner-centered formative practices complement competency-based mandates, particularly in TVL subjects where hands-on performance is essential.

In sum, this introduction establishes the study’s relevance by weaving together the national education and TVET policy frameworks, existing gaps in instructional approaches, and emerging evidence on peer assessment. It underscores the study’s contribution to enhancing practical learning through structured peer feedback, grounded in the particularities of Philippine TLE/TVL education and supported by national policy and current scholarship.

2. Method

2.1 Research Design

The study employed a quasi-experimental research design utilizing a single-group pretest–posttest approach to examine the effectiveness of structured peer assessment and feedback in enhancing product quality in Bread and Pastry Production. This design was deemed appropriate as it allowed the researchers to measure changes in the participants' performance by comparing baseline data collected before the intervention with outcomes recorded after its implementation, without the use of a control group. The intervention consisted of systematically structured peer evaluation sessions, wherein learners assessed one another's work using standardized TESDA-aligned competency rubrics, followed by guided feedback discussions facilitated by the instructor. This methodological choice enabled the study to capture the direct impact of peer assessment on learners' technical skills, while maintaining ecological validity within the natural classroom setting.

2.2 Participants

The respondents of the study were 40 Bread and Pastry Production students enrolled at Maxima Technical and Skills Training Institute, Inc. during the academic year in which the research was conducted. These participants were purposively selected, as they were directly engaged in competency-based training aligned with the Technical Education and Skills Development Authority (TESDA) curriculum standards for Bread and Pastry Production NC II. The group was composed of learners with varying levels of prior baking experience, ensuring a realistic representation of a typical technical-vocational class. Their inclusion was based on their active participation in both the pre-intervention and post-intervention assessments, as well as their involvement in the structured peer assessment and feedback activities designed to enhance product quality and technical proficiency.

2.3 Instrumentation

The study utilized a combination of quantitative and qualitative instruments to gather comprehensive data on the effectiveness of structured peer assessment and feedback in enhancing product quality in Bread and Pastry Production. A standardized performance rubric, adapted from the competency-based assessment tools prescribed by TESDA and aligned with DepEd's K to 12 TLE/TVL curriculum standards, was employed to evaluate students' outputs in terms of appearance, taste, texture, and adherence to specifications during both the pretest and posttest. This rubric ensured objective and consistent measurement of technical skills and product quality. In addition, a researcher-developed questionnaire was administered to capture students' perceptions of how structured peer assessment influenced their motivation and confidence. Open-ended reflection prompts were also included to elicit qualitative insights, allowing for thematic analysis of students' experiences and attitudes toward the intervention.

2.4 Data Analysis

The data gathered from the study were analyzed using both quantitative and qualitative methods to address the research objectives comprehensively. Descriptive statistics, specifically the mean and standard deviation, were employed to determine the level of product quality in Bread and Pastry Production before and after the implementation of structured peer assessment and feedback. A paired sample t-test was conducted to ascertain the presence of a statistically significant difference between pretest and posttest scores, thereby measuring the intervention's effectiveness in improving technical performance. For the qualitative component, students' written reflections and responses to open-ended questions were subjected to thematic analysis, allowing the identification of recurring patterns and themes related to changes in motivation, confidence,

and skill development. This mixed-method approach ensured a robust interpretation of findings by integrating objective performance measures with rich, experiential insights from the learners.

3. Results

The findings of the study revealed that the level of product quality in Bread and Pastry Production among students before the implementation of structured peer assessment and feedback was moderately satisfactory, with a computed mean score of 3.05 (SD = 0.42) based on a rubric aligned with TESDA and DepEd competency standards. This indicated that while learners demonstrated basic competency in technical skills, there were notable gaps in consistency, precision, and adherence to professional standards in terms of taste, texture, appearance, and presentation. The relatively higher standard deviation further suggested variability in performance, implying that while some students achieved acceptable quality outputs, others struggled to meet competency expectations. This baseline assessment established the need for an intervention that could enhance both the quality and consistency of learner outputs in practical production tasks.

After the implementation of structured peer assessment and feedback, there was a marked improvement in students' performance, as reflected in the posttest mean score of 4.21 (SD = 0.28). The higher mean indicated a shift toward a "very satisfactory" level of product quality, characterized by improved technical execution, uniformity, and compliance with professional standards in bread and pastry preparation. The reduction in standard deviation highlighted a more consistent level of performance across the class, suggesting that the intervention helped standardize skill proficiency among learners. Peer feedback facilitated greater attention to detail, better adherence to quality standards, and improved craftsmanship, as students became more aware of both their strengths and areas needing improvement through constructive evaluations from their classmates.

The results of the paired sample t-test confirmed that the observed improvement was statistically significant ($t(39) = 12.47, p < 0.001$), affirming the effectiveness of structured peer assessment and feedback in enhancing technical skills and product quality. Beyond quantitative gains, qualitative analysis revealed that students experienced heightened motivation, confidence, and accountability because of the intervention. Recurring themes from reflective responses included increased self-awareness, enhanced problem-solving skills, and a stronger commitment to excellence. Learners expressed that the structured peer feedback process encouraged them to evaluate their work critically, set higher performance goals, and adopt strategies for continuous improvement. These combined findings demonstrate that the intervention not only improved measurable output quality but also fostered a more engaged and self-directed learning environment.

4. Discussion

Hermans (2019) emphasized that structured peer assessment significantly enhances learning outcomes by engaging students in evaluative judgment and reflective thinking. Similar to the observed improvement in product quality in Bread and Pastry Production, Topping's research demonstrated that structured peer feedback encourages learners to internalize performance criteria, thereby improving their ability to self-assess and meet professional standards. This aligns with the present study's outcome, wherein students' post-intervention performance reached a "very satisfactory" level, suggesting that peer assessment not only serves as a supplementary evaluation tool but also cultivates mastery of technical skills through active participation in the assessment process.

Moreover, the study's results support the findings of Ganotice et al. (2022), who reported that peer feedback in skill-based training promotes greater accountability and consistency in learners' work. Their research in vocational and technical contexts revealed that structured

feedback sessions led to reduced variability in performance, paralleling the present study's outcome of decreased standard deviation in post-intervention scores. Both studies highlight that when learners receive clear, constructive, and criterion-based feedback from their peers, they develop a heightened sense of responsibility toward maintaining quality, ultimately leading to more uniform and improved outputs. This reflects the mechanism observed in the current study, where structured peer assessment fostered collective adherence to TESDA-aligned competency standards.

The findings also resonate with the work of Meletiadiou (2021), whose meta-analysis found strong positive correlations between peer and teacher assessments in terms of accuracy and reliability, particularly in performance-based disciplines. In the context of Bread and Pastry Production, this implies that students, when adequately trained in structured assessment, can provide evaluations comparable to those of instructors, thereby reinforcing skill acquisition. The alignment between the present study's significant t-test results and Falchikov and Goldfinch's conclusions suggests that structured peer assessment can serve as a credible and effective complement to teacher-led evaluations, enabling more frequent and formative feedback cycles that drive technical improvement.

Furthermore, the study's qualitative findings regarding increased motivation and confidence align with the work of Dahal et al. (2022), who argued that peer assessment not only develops cognitive skills but also strengthens effective and social dimensions of learning. Like the themes identified in this study—self-awareness, enhanced craftsmanship, and accountability—their research demonstrated that peer feedback fosters a supportive learning culture where learners are more engaged and committed to quality improvement. This dual benefit, combining skill enhancement with personal growth, underscores the potential of structured peer assessment as a transformative strategy in technical-vocational education, consistent with DepEd's learner-centered pedagogical framework and TESDA's competency-based training philosophy.

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