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Blended Instruction in Technology Livelihood Education: Implementation, Effectiveness, and Challenges Encountered by Grade 10 Dressmaking Students

Jessa Marie D. Alcala
Master of Arts in Teaching Vocational Education, Major in Garments Technology, Bohol Island State University – Main Campus, Tagbilaran City, Bohol, Philippines

Email: alcalajessa08@gmail.com

ABSTRACT

This study examined the perceived effectiveness of blended instruction in developing competencies in Technology and Livelihood Education (TLE) Dressmaking among Junior High School students in the First Congressional District of Bohol during School Year 2026–2027. Specifically, it determined the level of implementation of blended instruction, its effectiveness in developing knowledge acquisition, skills performance, and work attitudes, and the challenges encountered by teachers and learners. The study employed a convergent parallel mixed-methods design involving 98 Grade 10 learners and 12 TLE Dressmaking teachers. Quantitative data were gathered using a researcher-made questionnaire with a Cronbach's alpha coefficient of 0.956, while qualitative data were collected through semi-structured interviews. Findings revealed that blended instruction was Highly Implemented (WM = 3.45). Among learners, Skill Performance obtained the highest mean (WM = 3.51), while Learning Environment Conditions obtained the lowest (WM = 3.33). Among teachers, Knowledge Acquisition obtained the highest mean (WM = 3.55), while Learning Environment Conditions obtained the lowest (WM = 3.27). Blended instruction was also perceived as Very Effective (Learners: WM = 3.42; Teachers: WM = 3.34). Work Attitudes obtained the highest ratings among learners (WM = 3.46) and teachers (WM = 3.38). The challenges encountered were rated Moderately Challenged (Learners: WM = 3.10; Teachers: WM = 2.99). A significant moderate positive relationship existed between perceived effectiveness and challenges among learners ($\rho = .352$, $p < .001$), while no significant relationship was found among teachers ($\rho = -.173$, $p = .591$). Qualitative findings highlighted the importance of face-to-face demonstrations, teacher guidance, reviewable learning resources, learner independence, and hands-on practice in enhancing dressmaking competencies. Based on the findings, an instructional enhancement plan was proposed to strengthen the implementation of blended instruction in TLE Dressmaking.

Keywords: *Blended Instruction, TLE Dressmaking, Competency Development, Perceived Effectiveness, Instructional Enhancement Plan*

1. INTRODUCTION

Blended instruction integrates face-to-face teaching with online, modular, and technology-assisted learning to maintain access to education while supporting practical skill development. In Technology and Livelihood Education (TLE) Dressmaking, this integration is particularly important because theoretical knowledge must be reinforced through demonstrations, supervised sewing activities, and feedback. The Department of Education (2020) promoted flexible delivery through its learning continuity plan, while the Enhanced Basic Education Act of 2013 (Republic of the Philippines, 2013) emphasizes learner-centered, competency-based education. Blended approaches connect vocational learning with practical applications and labor-market needs (Song & Lai, 2025). This study examines the perceived effectiveness of blended instruction in developing competencies among Grade 10 TLE Dressmaking learners in selected public secondary schools in the First Congressional District of Bohol during School Year 2026–2027. It focuses on knowledge acquisition, skills performance, work attitudes, and learning environment conditions, with the findings intended to inform an instructional enhancement plan.

Research Problem

Despite the expansion of blended learning, evidence specific to Grade 10 TLE Dressmaking in the First Congressional District of Bohol remains limited. Arban et al. (2024) highlighted implementation challenges in local TLE education. Dressmaking requires accessible sewing equipment, sufficient practice time, teacher supervision, and reliable instructional resources, which may be constrained by connectivity and learning facilities. Blended learning can improve flexibility and engagement (Horn & Staker, 2015), while Horn and Staker (2015) emphasized the importance of integrating digital resources, collaboration, and instructional support. In technical-vocational education, flexible delivery can connect conceptual understanding with practical application (UNESCO, 2023), while UNESCO (2023) associated vocational education with technical skills and workplace readiness. UNESCO (2023) emphasized the value of visual learning materials in understanding technical procedures. However, technological limitations, inadequate resources, and insufficient supervision may affect learning outcomes. OECD (2023a) identified technological constraints as barriers to blended learning, while UNESCO (2023) emphasized connectivity and resource limitations. Practical demonstrations contribute to sewing competence (Song & Lai, 2025), visual resources support procedural understanding (Cabardo, 2021), and repeated practice strengthens confidence (Bandura, 1997). Although blended environments encourage learner engagement (Song & Lai, 2025), limited materials and insufficient practice opportunities remain concerns (UNESCO, 2023). The central research problem is the limited understanding of how teachers and learners perceive the implementation, effectiveness, and challenges of blended instruction in developing TLE Dressmaking competencies. Specifically, the study examines knowledge acquisition, skills performance, work attitudes, and learning environment conditions, including the relationship between perceived effectiveness and implementation challenges and differences between teacher and learner perceptions. The investigation focuses on perceived effectiveness rather than direct measurement of competency gains.

Assumptions of the Study

The study is grounded in the premise that integrating online learning resources, modular activities, video demonstrations, and supervised face-to-face instruction can support the development of knowledge, practical skills, and positive work attitudes. Horn and Staker (2015) associated digital resources with flexible learning, while Mayer (2009) explained that visual and verbal information support understanding and retention. Knowles (1975) emphasized independent learning, whereas Vygotsky (1978) highlighted the importance of guided interaction

in knowledge construction. The study further assumes that competency development involves understanding dressmaking concepts and procedures (Mayer, 2009), performing practical sewing tasks (Song & Lai, 2025), and developing responsibility, discipline, and cooperation through meaningful learning experiences, consistent with John Dewey (1938). Supportive learning environments are also considered important for learner engagement and competency development (Horn & Staker, 2015). These assumptions serve as conceptual premises rather than established findings. The study also examines two null hypotheses: that no significant relationship exists between perceived effectiveness and implementation challenges, and that no significant difference exists between teachers' and learners' perceptions of these challenges.

Objectives of the Study

The study aims to determine the perceived effectiveness of blended instruction in developing competencies among Grade 10 TLE Dressmaking learners in selected public secondary schools in the First Congressional District of Bohol during School Year 2026–2027. Specifically, it seeks to determine the level of blended instruction implementation in terms of knowledge acquisition, skills performance, work attitudes, and learning environment conditions; assess its perceived effectiveness in developing knowledge, skills, and work attitudes; identify challenges encountered by teachers and learners; examine the relationship between perceived effectiveness and implementation challenges; determine differences between teacher and learner perceptions; explore their lived experiences regarding blended instruction; integrate quantitative and qualitative findings to identify areas of convergence and divergence; and formulate an instructional enhancement plan. The investigation is limited to participating Grade 10 TLE Dressmaking learners and teachers and does not directly measure actual academic achievement or observed competency outcomes.

Conceptual and Theoretical Framework

The study is anchored in Social Constructivism Theory, Community of Inquiry Theory, Cognitive Load Theory, and Self-Directed Learning Theory. Social Constructivism Theory emphasizes learning through social interaction, collaboration, and guided experiences (Vygotsky, 1978). The Community of Inquiry framework explains meaningful learning through the interaction of cognitive, social, and teaching presence, as developed by Garrison et al. (2000). Cognitive Load Theory emphasizes organizing instructional materials to reduce information overload (Sweller, 1988), while Self-Directed Learning Theory highlights learner independence and responsibility (Knowles, 1975). These theoretical perspectives support the integration of online materials, modular activities, video demonstrations, and supervised practical instruction. Experiential learning further emphasizes the importance of meaningful activities in developing understanding and positive work attitudes (Dewey, 1938). According to Department of Education (2023), TLE programs emphasize competency-based learning aligned with workplace requirements. Dewey (1938) also emphasized active participation in practical experiences as essential to meaningful learning. Related literature supports blended instruction as an approach that promotes flexibility, accessibility, and independent learning (Song & Lai, 2025). UNESCO (2023) emphasized the importance of flexible modalities in maintaining skills training, while (Song & Lai, 2025) highlighted practical activities in developing technical competencies. Multimedia instruction enhances comprehension and retention (Mayer, 2009), although direct teacher supervision remains necessary in skills-based education (UNESCO, 2023). Song and Lai (2025) further emphasized educational continuity and learner adaptability through blended learning. The conceptual framework considers blended instruction through its implementation, perceived effectiveness, and challenges in relation to knowledge acquisition, skills performance, work attitudes, and learning environment conditions. Horn and Staker (2015) identified essential components of blended instruction, while (Song & Lai, 2025) emphasized the importance of

guided practice in developing technical competencies. Although technological and instructional challenges may affect implementation (UNESCO, 2023), blended learning continues to support flexibility and learner engagement (Song & Lai, 2025). The study is also supported by the 1987 Philippine Constitution, Article XIV (Republic of the Philippines, 1987); Republic Act No. 10533 (Republic of the Philippines, 2013); DepEd Order No. 012, s. 2020 (Department of Education, 2020); DepEd Order No. 044, s. 2022 (Department of Education, 2022); DepEd Order No. 010, s. 2024 (Department of Education, 2024a); and DepEd Order No. 012, s. 2024 (Department of Education, 2024b). These legal and policy foundations promote accessible, learner-centered, competency-based, and flexible education. Collectively, the theoretical, conceptual, and policy foundations guide the assessment of blended instruction and the development of a proposed instructional enhancement plan.

Sustainable Development Goal and Multidisciplinary Sustainability Relevance

The study aligns primarily with Sustainable Development Goal 4 (Quality Education) and Sustainable Development Goal 8 (Decent Work and Economic Growth). SDG 4 emphasizes inclusive, equitable, and quality education and lifelong learning opportunities. The study supports this goal by examining how blended instruction facilitates flexible learning, educational continuity, and competency development in TLE Dressmaking. By identifying instructional challenges related to technological resources, learning materials, teacher supervision, and practical activities, the research may contribute to improving the accessibility and effectiveness of technical-vocational education. SDG 8 promotes productive employment, decent work, and sustainable economic growth. The study contributes to this goal by examining instructional practices that support the development of technical competencies, practical sewing skills, and positive work attitudes relevant to employment, entrepreneurship, and livelihood opportunities. Strengthening Dressmaking instruction may help prepare learners for further technical training and future participation in vocational and economic activities. In terms of sustainability, the study emphasizes educational and socio-economic sustainability. Educational sustainability is reflected in the potential to strengthen flexible instructional delivery, maintain learning continuity during disruptions, and improve access to competency-based education. Socio-economic sustainability is reflected in developing practical skills and work attitudes that may support employability, entrepreneurship, and community livelihood development. The proposed instructional enhancement plan is intended to address identified challenges and improve instructional resources, teaching strategies, practical learning opportunities, and learner support. Through these contributions, the research may support more accessible, effective, and sustainable technical-vocational education without claiming to directly measure SDG attainment.

2. METHODOLOGY

Research Design

The study utilized a convergent parallel mixed-methods research design, wherein quantitative and qualitative data were collected concurrently, analyzed independently, and integrated during the interpretation of findings. This design enabled the researcher to examine measurable patterns, relationships, and differences while exploring the lived experiences of teachers and learners regarding blended instruction in TLE Dressmaking. The quantitative component employed a researcher-made survey questionnaire administered to 98 Grade 10 learners and 12 TLE Dressmaking teachers. It assessed the level of implementation, perceived effectiveness, and challenges of blended instruction in terms of knowledge acquisition, skills performance, work attitudes, and learning environment conditions. The qualitative component involved semi-structured interviews with seven teachers and ten learners selected based on their direct experiences with blended instruction. The integration of both data sets provided a more

comprehensive understanding of the strengths, limitations, and instructional implications of blended learning.

Research Locale or Study Setting

The study was conducted in selected public secondary schools offering TLE Dressmaking in the First Congressional District of Bohol, Philippines, during School Year 2026–2027. These schools implemented blended instruction through online or modular learning activities combined with face-to-face practical sessions. The research setting represented learning environments where Grade 10 learners developed theoretical knowledge, practical dressmaking skills, and work attitudes. Participating schools varied in their access to internet connectivity, technological resources, sewing tools and equipment, instructional materials, learning facilities, and teacher support. These conditions were relevant to evaluating the implementation and perceived effectiveness of blended instruction.

Participants or Data Sources

The study involved 110 respondents, comprising 98 Grade 10 TLE Dressmaking learners and 12 teachers from ten selected public secondary schools in the First Congressional District of Bohol. The learners were officially enrolled in TLE Dressmaking during School Year 2026–2027, while the teachers handled the participating classes. Total enumeration was employed for teachers, including all 12 teachers from the participating schools. For learners, proportionate stratified random sampling was utilized to select 98 respondents from a population of 127. The learner population was stratified according to school, and the sample was proportionately allocated to ensure adequate representation. Random selection within each school provided eligible learners an equal opportunity for inclusion. For the qualitative component, seven teachers and ten learners were purposively selected based on their direct experiences with blended instruction. Their participation provided insights into instructional implementation, competency development, and challenges encountered in TLE Dressmaking.

Research Instruments or Materials

The study utilized a researcher-made survey questionnaire and a semi-structured interview guide. The questionnaire was developed based on the Department of Education (2016, 2023) curriculum guidelines and the Technical Education and Skills Development Authority (TESDA) Training Regulations for Dressmaking to ensure alignment with the required competencies. These curriculum and training standards provided the basis for identifying relevant knowledge, practical skills, and work attitudes in TLE Dressmaking. It consisted of four components assessing the implementation of blended instruction in terms of knowledge acquisition, skills performance, work attitudes, and learning environment conditions; its perceived effectiveness in developing competencies; challenges encountered by teachers and learners; and suggestions for instructional enhancement. A four-point Likert scale was employed to assess implementation, effectiveness, and challenges. Mean scores ranging from 3.26 to 4.00 represented the highest rating category, 2.51 to 3.25 the moderate category, 1.76 to 2.50 the slight category, and 1.00 to 1.75 the lowest category. The descriptive interpretations varied according to the dimension being assessed. Content validity was established through expert evaluation by specialists in TLE Dressmaking, curriculum development, and educational research. Their recommendations were incorporated to improve the clarity, relevance, and alignment of the questionnaire. A pilot test involving learners excluded from the actual study yielded a Cronbach's alpha coefficient of 0.956, indicating excellent internal consistency. For the qualitative component, a validated semi-structured interview guide containing open-ended questions was used to explore participants' experiences, perceptions, and challenges regarding

blended instruction. Follow-up questions allowed participants to elaborate on their responses and provide additional insights relevant to the proposed instructional enhancement plan.

Data Gathering Procedure

Data collection commenced after securing formal approval from the Department of Education Division Office and the administrators of participating schools. The researcher coordinated with school heads and TLE Dressmaking teachers regarding the administration of research instruments and the data-gathering schedule. Before administering the questionnaires, the researcher explained the study's purpose, procedures, and significance to the participants. Informed consent was obtained, including parental consent and learner assent when required. The validated questionnaires were administered to the selected Grade 10 TLE Dressmaking learners, while participating teachers received the appropriate research instrument. Clear instructions were provided, and questions regarding questionnaire completion were addressed. Semi-structured interviews were conducted with purposively selected teachers and learners to obtain detailed accounts of their experiences with blended instruction, particularly its implementation, perceived effectiveness, and challenges. The collected quantitative and qualitative responses were subsequently checked, organized, coded, and prepared for analysis.

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. Frequency counts and percentages described respondent distribution and challenges encountered, while weighted means and standard deviations determined the perceived levels of implementation and effectiveness of blended instruction in relation to knowledge acquisition, skills performance, work attitudes, and learning environment conditions. Spearman's Rank-Order Correlation (Spearman's rho) was employed to examine the relationship between perceived effectiveness and implementation challenges, considering the ordinal nature of the four-point Likert-scale responses. An independent-samples t-test was used to determine significant differences between teachers' and learners' perceptions of the challenges encountered in blended instruction. Qualitative data obtained from interviews and open-ended responses were analyzed through thematic analysis. Responses were coded, categorized, and organized into themes reflecting participants' experiences with the implementation, effectiveness, and challenges of blended instruction. The emerging themes were compared with quantitative findings to identify convergence and divergence between the two data sets. The integrated findings served as the basis for developing an instructional enhancement plan addressing identified needs in resources, technology, teaching strategies, assessment, practical activities, and teacher and learner support.

Ethical Consideration

The study observed ethical research procedures to protect the rights, privacy, and welfare of participants. Necessary permissions were secured from the Department of Education Division Office and participating school administrators before data collection. Participants were informed about the study's objectives, procedures, and significance, and informed consent was obtained before participation. Parental consent and learner assent were secured when required. Participation was voluntary, and respondents were informed of their right to withdraw at any time without penalty. Confidentiality and anonymity were maintained by excluding names from questionnaires and assigning codes to protect participants' identities. All collected information was securely maintained and used exclusively for research purposes.

3. RESULTS AND DISCUSSION

3.1 Implementation of Blended Instruction in TLE Dressmaking

Blended instruction was rated Highly Implemented by both learners and teachers, with an identical overall composite mean of 3.45. The findings indicate that online and modular instruction, combined with face-to-face demonstrations and practical activities, was extensively implemented across the participating schools.

3.1.1 Knowledge Acquisition

Knowledge acquisition was rated Highly Implemented by learners (WM = 3.47) and teachers (WM = 3.55). Learners gave the highest rating to identifying the functions of sewing tools (WM = 3.68), while teachers rated describing proper body measurement procedures and explaining the importance of accurate measurements highest (WM = 3.75). However, interpreting dressmaking pattern symbols (WM = 3.23) and describing sewing machine cleaning procedures (WM = 3.26) received comparatively lower ratings among learners. These findings indicate that blended instruction supported conceptual and procedural knowledge through modules, instructional videos, and teacher demonstrations. Song and Lai (2025) emphasized that blended learning connects theoretical instruction with practical application, while Song and Lai (2025) highlighted its contribution to understanding and academic performance in Technology Livelihood Education. However, technical competencies requiring repeated demonstrations and supervision remain more difficult to develop independently, consistent with Song and Lai (2025). The results also reflect the importance of teaching presence in the Community of Inquiry Framework.

3.1.2 Skills Performance and Work Attitudes

Skills performance was highly implemented, obtaining a composite mean of 3.51 among learners and 3.45 among teachers. It was the highest-rated implementation dimension among learners. Both groups also rated the implementation of work-attitude-related activities highly, indicating that blended instruction incorporated practical learning, independent tasks, and classroom activities that encouraged responsibility and participation. The results suggest that blended instruction supported practical competency development by combining independent preparation with supervised activities. The integration of online resources and classroom instruction allowed learners to review procedures before performing sewing tasks. Nevertheless, practical skill mastery remained dependent on demonstrations, access to equipment, and teacher feedback. This reinforces the importance of combining flexible instruction with direct supervision in technical-vocational education.

3.1.3 Learning Environment Conditions

Learning environment conditions obtained the lowest implementation ratings among learners (WM = 3.33) and teachers (WM = 3.27), although both remained Highly Implemented. Learners rated access to suitable pattern-drafting spaces highest (WM = 3.50), while stable internet connectivity (WM = 3.12) and minimal distractions during garment construction (WM = 3.16) received lower ratings. Teachers identified the availability of learning materials and minimal distractions as relatively strong indicators (WM = 3.42), while access to suitable pattern-drafting and safe sewing machine operation spaces received lower ratings (WM = 3.17). These findings indicate that technological and physical learning conditions remained limitations despite the high implementation of blended instruction. UNESCO (2023) identified internet connectivity and technological access as important implementation challenges, while OECD (2023a) emphasized

the effects of inadequate learning conditions and communication difficulties on learner engagement. The findings suggest that effective blended instruction in Dressmaking requires adequate learning spaces, sewing equipment, technological resources, and instructional support.

3.2 Effectiveness of Blended Instruction in Developing Competencies

Blended instruction was perceived as Very Effective by learners (WM = 3.42) and teachers (WM = 3.34). The findings indicate positive perceptions of its contribution to knowledge acquisition, skills performance, and work attitudes, although differences were observed across these competency dimensions.

3.2.1 Knowledge Acquisition

Knowledge acquisition was rated Very Effective by learners (WM = 3.37) and teachers (WM = 3.36). Learners rated interpreting pattern-drafting instructions highest (WM = 3.57), while teachers rated recalling concepts discussed online and in class highest (WM = 3.55). Understanding written instructions in modules received the lowest learner rating (WM = 3.23). Teachers similarly gave lower ratings to understanding written instructions, identifying appropriate garment-finishing techniques, and understanding lessons with minimal supervision (WM = 3.25). The findings suggest that blended instruction supported understanding and retention through repeated exposure to learning materials. Song and Lai (2025) emphasized the advantages of combining instructional modalities to reinforce theoretical learning. However, written modules alone may be insufficient for explaining complex dressmaking procedures. UNESCO (2023) and Song and Lai (2025) emphasized that technical competencies require visual demonstrations, guided practice, and immediate feedback to support comprehension and mastery.

3.2.2 Skills Performance

Skills performance was perceived as Very Effective by learners (WM = 3.44) and teachers (WM = 3.28). Although both groups evaluated blended instruction positively, teachers rated skills performance lower than the other effectiveness dimensions. The results indicate that blended instruction supported the development of practical competencies, but teachers expressed relatively greater reservations about learners' performance of technical tasks. This difference suggests that understanding procedures through instructional materials does not necessarily ensure independent practical mastery. Dressmaking requires direct observation, repeated practice, and immediate correction of errors. The findings are consistent with the emphasis of Song and Lai (2025) and UNESCO (2023) on adequate hands-on activities and supervision in technical-vocational learning.

3.2.3 Work Attitudes

Work attitudes obtained the highest effectiveness ratings among learners (WM = 3.46) and teachers (WM = 3.38). Both groups rated accepting corrections positively as the strongest indicator, with weighted means of 3.60 and 3.58, respectively. Learners also rated practicing safe work habits highly (WM = 3.54). However, managing time when completing garment construction tasks received a lower learner rating (WM = 3.31), while teachers rated completing tasks within the allotted time as Moderately Effective (WM = 3.00). The findings indicate that blended instruction supported responsibility, discipline, safety awareness, and receptiveness to

feedback, although time management remained a concern. Song and Lai (2025) emphasized learner responsibility and adaptability in blended learning, while Prestoza (2024) associated varied instructional approaches with engagement and positive learning behaviors. UNESCO (2023) and Song and Lai (2025) further emphasized the importance of sufficient practice time and supervision, particularly when learners complete practical tasks independently.

3.3 Challenges Encountered in Implementing Blended Instruction

Both groups were Moderately Challenged in implementing blended instruction, with overall composite means of 3.10 among learners and 2.99 among teachers. Learners identified knowledge acquisition as their most challenging dimension, while teachers identified learning environment conditions. These differences reflected the instructional and practical demands experienced by each group.

3.3.1 Challenges in Knowledge Acquisition

Knowledge acquisition obtained the highest challenge rating among learners (M = 3.20). Identifying learning resources needed for Dressmaking received the highest rating (M = 3.27), followed by understanding concepts presented in modules (M = 3.26). Interpreting sewing machine video demonstrations received a lower challenge rating (M = 3.11), although it remained Moderately Challenged. These findings suggest that independent learning created difficulties in identifying appropriate materials and understanding technical concepts without immediate guidance. OECD (2023a) emphasized resource management and self-directed learning difficulties in blended environments. Furthermore, OECD (2023b) examined digital education ecosystems and governance, providing a broader context for understanding how the organization and coordination of digital education resources can influence the conditions supporting blended instruction. Song and Lai (2025) highlighted the importance of direct demonstrations and instructor support in vocational education, while Song and Lai (2025) emphasized multimedia resources as useful for understanding procedural knowledge.

3.3.2 Challenges in Skills Performance and Work Attitudes

Learners reported moderate challenges in skills performance (M = 3.12) and work attitudes (M = 3.06), while teachers reported corresponding means of 2.99 and 2.84. These results indicate that learners encountered difficulties completing practical activities and maintaining discipline, motivation, and time management during independent learning. Teachers perceived work attitudes as the least challenging dimension. The findings reflect the demands of developing technical competencies through a combination of independent and supervised activities. Practical sewing tasks require equipment, adequate time, and opportunities for correction, while independent learning requires self-regulation and sustained motivation. The relatively lower teacher rating for work-attitude challenges suggests that teachers perceived fewer difficulties in this area than learners.

3.3.3 Challenges in Learning Environment Conditions

Learning environment conditions were the most challenging dimension for teachers (M = 3.08). Limited availability of sewing machines received the highest challenge rating (M = 3.42), interpreted as Highly Challenged. Poor internet connectivity and difficulty understanding module-based concepts also received relatively high ratings (M = 3.17). Lack of quiet learning spaces and frequent distractions were rated lower (M = 2.83). Learners reported moderate

challenges in learning environment conditions (M = 3.01). The findings indicate that limited equipment and technological resources affected the implementation of practical instruction. UNESCO (2023) and Song and Lai (2025) emphasized the importance of adequate equipment and facilities in technical-vocational education. OECD (2023a) also identified technological barriers as factors influencing learner participation and instructional effectiveness. These findings underscore the importance of accessible sewing machines, materials, internet connectivity, and suitable practice spaces.

3.4 Relationship Between Perceived Effectiveness and Implementation Challenges

3.4.1 Relationship Among Learners

Spearman's rank-order correlation revealed a statistically significant positive relationship between perceived effectiveness and implementation challenges among learners ($\rho = .352$, $p < .001$). The null hypothesis was rejected at the .05 significance level. Learners who rated blended instruction as more effective also tended to report greater implementation challenges. The findings suggest that learners recognized the educational value of blended instruction while simultaneously experiencing difficulties in accessing resources, completing independent tasks, and performing practical activities. Horn and Staker (2015) emphasized the flexibility and accessibility provided by blended instruction, while Prestoza (2024) identified technological limitations as continuing concerns. The positive relationship does not establish causation or indicate that challenges improve effectiveness.

3.4.2 Relationship Among Teachers

Among teachers, the correlation between perceived effectiveness and implementation challenges was weak and negative ($\rho = -.173$, $p = .591$). The relationship was not statistically significant, and the null hypothesis was not rejected. This indicates insufficient evidence of an association between the two variables among teachers. The findings suggest that teachers evaluated instructional effectiveness separately from operational difficulties. Song and Lai (2025) emphasized that blended learning effectiveness depends on instructional design and implementation, while Song and Lai (2025) identified technological limitations, insufficient resources, and digital competence as common challenges. Teachers may continue to recognize the instructional benefits of blended learning despite these difficulties. However, the relatively small teacher sample ($n = 12$) requires cautious interpretation.

3.5 Differences Between Teachers' and Learners' Perceptions of Challenges

3.5.1 Differences Across Challenge Dimensions

The independent-samples comparison revealed no statistically significant differences between learners and teachers across the four challenge dimensions. For knowledge acquisition, learners obtained a mean of 3.20 and teachers 3.06 ($p = .467$). Skills performance obtained means of 3.12 and 2.99 ($p = .566$), while work attitudes obtained means of 3.06 and 2.84 ($p = .385$). Learning environment conditions yielded means of 3.01 and 3.08, respectively ($p = .737$). These findings indicate that both groups experienced comparable challenges in understanding concepts, performing practical activities, maintaining work attitudes, and accessing learning resources. OECD (2023a) emphasized learner autonomy and self-regulation as concerns in blended learning. Song and Lai (2025) and UNESCO (2023) highlighted the importance of practical supervision and equipment, while UNESCO (2023), and Song and Lai (2025) identified resource and connectivity limitations as recurring challenges.

3.5.2 Overall Difference in Perceptions

The overall challenge ratings were 3.10 for learners and 2.99 for teachers. The difference was not statistically significant ($t = 0.540$, $p = .591$), and the null hypothesis was not rejected. Both groups therefore reported similar overall levels of difficulty in implementing blended instruction. The findings indicate that implementation challenges were shared across the instructional environment rather than confined to teachers or learners. OECD (2023a), UNESCO (2023), and Song and Lai (2025) identified common barriers involving instructional delivery, independent learning, technological access, and practical competency development. The results support addressing these challenges through coordinated instructional and resource support for both groups.

3.6 Lived Experiences of Teachers and Learners Regarding Blended Instruction

3.6.1 Experiences in the Implementation of Blended Instruction

The qualitative findings identified four themes concerning implementation: the division of learning activities between online and face-to-face modalities, the importance of classroom demonstrations and feedback, the use of digital resources for independent learning, and adaptation to blended instruction. All seven interviewed teachers and six learners described online instruction as primarily supporting theoretical lessons, modules, and videos, while face-to-face sessions provided opportunities for demonstrations and practical activities. Four teachers and eight learners emphasized the importance of direct supervision and feedback. Five teachers described using digital tools to support instruction, while six learners reported using online videos and research for independent learning. Five teachers also described simplifying instructions and adjusting learning activities according to the delivery modality. These experiences indicate that blended instruction operated through complementary learning modalities, with online resources supporting conceptual preparation and face-to-face sessions strengthening practical skills. This is consistent with UNESCO (2023) and Horn and Staker (2015). The findings reflect the importance of guided interaction in skill development, consistent with Vygotsky (1978) and the Community of Inquiry framework (Garrison et al., 2000). Independent learning also reflected Knowles's (1975) emphasis on learner responsibility, while visual instructional resources supported procedural understanding (UNESCO, 2023; Mayer, 2009). The simplification of instructional materials was consistent with Cognitive Load Theory (Sweller, 1988).

3.6.2 Experiences Regarding the Effectiveness of Blended Instruction

Four themes emerged regarding effectiveness: improved conceptual understanding through reviewable instructional materials, difficulties developing practical skills without direct guidance, acquisition of specific dressmaking competencies, and changes in motivation and work attitudes. Five teachers and six learners reported that modules and videos improved understanding because lessons could be reviewed repeatedly. However, five teachers and three learners identified difficulties in performing technical procedures without demonstrations. Two teachers described improvements following repeated video demonstrations, while learners reported acquiring competencies in measuring, stitching, pattern making, and sewing. Five teachers observed increased interest in practical activities, while five learners reported greater independence and patience. Nevertheless, three learners experienced reduced motivation when teacher guidance was unavailable, and two reported no change in motivation. The findings

suggest that blended instruction was perceived as beneficial for conceptual understanding and positive work attitudes, while practical skill development depended more strongly on guided demonstrations and feedback. UNESCO (2023) and Mayer (2009) emphasized the benefits of visual and verbal instructional materials for understanding technical procedures. Vygotsky (1978) supports the importance of guided interaction, particularly when learners encounter difficulties performing technical tasks independently.

3.6.3 Experiences Regarding Challenges in Blended Instruction

Five themes emerged concerning implementation challenges: limited access to sewing equipment and materials, unreliable internet connectivity, insufficient real-time demonstration and correction, difficulties assessing authentic skills performance, and challenges understanding complex dressmaking procedures. All seven teachers and two learners reported inadequate access to sewing machines, tools, and materials at home. All seven teachers and one learner identified connectivity difficulties, while four teachers and five learners described the absence of immediate demonstrations and feedback. Three teachers reported difficulty determining whether submitted sewing outputs reflected independent and correct performance. Five learners identified difficulties involving body measurements, pattern drafting, sketching, and sewing machine operation. These findings indicate that resource limitations and insufficient supervision were major barriers to practical competency development. Horn and Staker (2015) emphasized the importance of accessible instructional resources, while OECD (2023a) identified technological limitations as barriers to blended learning. The absence of immediate feedback reflected the importance of teaching presence (Garrison et al., 2000) and guided learning (Vygotsky, 1978). Difficulties assessing practical outputs were consistent with the performance-based requirements of competency-based instruction (Department of Education, 2023). Furthermore, Sweller (1988) emphasized that complex or poorly organized instructional materials may increase cognitive overload, particularly when learners perform unfamiliar technical procedures independently.

3.7 Convergence and Divergence of Quantitative and Qualitative Findings

3.7.1 Integration of Findings on Implementation

Quantitative and qualitative findings generally converged regarding the implementation of blended instruction. Both learners and teachers rated implementation as Highly Implemented (M = 3.45), while interviews confirmed the integration of online instructional materials and face-to-face practical activities. Skills performance received high implementation ratings from learners (M = 3.51) and teachers (M = 3.45), consistent with interview accounts emphasizing supervised practice. Learning environment conditions received the lowest implementation ratings (learners: M = 3.33; teachers: M = 3.27), corresponding with reported limitations in equipment, materials, and connectivity. Partial divergence emerged in independent learning, which received high quantitative ratings despite qualitative reports of confusion and dependence on additional support. The integration of both data strands followed the convergent parallel approach described by Creswell and Plano Clark (2018). The findings support the importance of combining conceptual instruction with practical application in technical-vocational education (UNESCO, 2023). Horn and Staker (2015) emphasized the role of instructional resources and learning conditions, while Knowles (1975) highlighted learner responsibility in independent learning. However, the qualitative findings also demonstrated the continuing importance of teacher guidance and instructional presence (Garrison et al., 2000).

3.7.2 Integration of Findings on Effectiveness

The quantitative findings showed that blended instruction was Very Effective among learners (M = 3.42) and teachers (M = 3.34). These results converged with qualitative accounts describing improved conceptual understanding, independent learning, and positive work attitudes. Knowledge acquisition received effectiveness ratings of 3.37 among learners and 3.36 among teachers, supported by interview responses describing the benefits of reviewable materials. Work attitudes received the highest effectiveness ratings (learners: M = 3.46; teachers: M = 3.38). Partial divergence emerged in skills performance, which learners rated higher (M = 3.44) than teachers (M = 3.28), while interviews revealed difficulties performing technical procedures without direct demonstrations. The findings suggest that blended instruction supported conceptual understanding and work attitudes, but practical competency development remained dependent on supervised activities. This agrees with the importance of reviewable visual resources emphasized by UNESCO (2023) and Mayer (2009), as well as the development of responsibility through meaningful practical experiences (Dewey, 1938). The need for demonstrations and immediate correction also reflects the importance of guided learning as emphasized by Vygotsky (1978).

3.7.3 Integration of Findings on Implementation Challenges

Quantitative findings showed that learners (M = 3.10) and teachers (M = 2.99) were Moderately Challenged, with no statistically significant difference between their overall perceptions ($t = 0.540$, $p = .591$). Qualitative findings confirmed shared difficulties involving limited sewing equipment, unstable internet connectivity, and inadequate real-time teacher supervision. All seven interviewed teachers reported equipment and connectivity limitations, while learners emphasized difficulties performing practical activities without immediate guidance. Partial divergence was observed in the relative importance of internet connectivity, which was more frequently emphasized by teachers than learners during interviews. These findings indicate that both groups encountered similar instructional limitations, although their experiences differed according to their responsibilities. OECD (2023a) emphasized the effects of technological limitations on blended instruction, while the Community of Inquiry framework (Garrison et al., 2000) highlights the importance of teacher guidance and interaction. The results suggest that practical competency development requires accessible learning resources and sufficient opportunities for direct supervision.

3.7.4 Integration of Findings on the Relationship Between Effectiveness and Challenges

The quantitative results established a significant positive relationship between perceived effectiveness and challenges among learners ($\rho = .352$, $p < .001$), but no significant relationship among teachers ($\rho = -.173$, $p = .591$). Qualitative findings supported the coexistence of instructional benefits and implementation difficulties. Learners acknowledged that blended instruction helped them understand lessons and develop skills despite difficulties with equipment, connectivity, and independent learning. Teachers similarly recognized the instructional benefits of blended learning while reporting limitations in resources and practical supervision. These findings indicate that perceived effectiveness and implementation challenges were not mutually exclusive. The positive learner correlation does not establish that challenges improve learning outcomes. Instead, the integrated findings show that learners could

perceive blended instruction as beneficial while experiencing difficulties in its implementation. The absence of a significant teacher correlation suggests that teachers' assessments of effectiveness were not statistically associated with the challenges they reported.

3.8 Overall Synthesis of Findings

The findings consistently demonstrated that blended instruction in TLE Dressmaking was highly implemented and perceived as very effective in developing knowledge acquisition, skills performance, and work attitudes. Both teachers and learners reported moderate implementation challenges, particularly concerning access to equipment, internet connectivity, independent learning, and opportunities for practical supervision. Although learners demonstrated a significant positive relationship between perceived effectiveness and implementation challenges, no significant relationship was established among teachers. The two groups also showed no significant difference in their overall perceptions of challenges. The qualitative findings reinforced the quantitative results by demonstrating that online materials were particularly useful for conceptual learning, while practical competencies required face-to-face demonstrations, direct feedback, and sufficient access to sewing tools and materials. The convergence of findings supports the proposed instructional enhancement plan, particularly in strengthening practical learning opportunities, technological and instructional resources, teacher guidance, and learner support. Overall, the study indicates that blended instruction can support TLE Dressmaking competency development, provided that its practical and resource-related limitations are addressed.

4. CONCLUSIONS AND RECOMMENDATIONS

The study concludes that blended instruction was highly implemented and perceived as very effective in developing knowledge acquisition, skills performance, and work attitudes among Grade 10 TLE Dressmaking learners in selected public secondary schools in the First Congressional District of Bohol. Both teachers and learners recognized the value of combining online and modular learning with face-to-face demonstrations and practical activities. However, moderate challenges involving limited sewing equipment, unstable internet connectivity, insufficient supervision, and difficulties in independent learning affected its implementation. A significant positive relationship between perceived effectiveness and implementation challenges was established among learners, but not among teachers. No significant difference was found between the two groups' overall perceptions of challenges. The integrated quantitative and qualitative findings indicate that blended instruction supports competency development while requiring adequate instructional resources, practical learning opportunities, and teacher guidance to address implementation difficulties. These findings provide a basis for the proposed instructional enhancement plan.

Based on the findings, school administrators should prioritize improving access to sewing machines, tools, instructional materials, and suitable practice facilities to address the most frequently reported implementation challenges. Schools should also strengthen internet connectivity and provide accessible offline learning resources for learners experiencing technological difficulties. TLE Dressmaking teachers should maintain the integration of online modules, instructional videos, and face-to-face activities while increasing opportunities for supervised practice, demonstrations, immediate feedback, and performance assessment. Instructional materials should provide clear, systematic procedures to support learners who experience difficulties understanding technical concepts independently. The Department of Education and school administrators should strengthen teacher support and instructional

planning to improve the implementation of blended learning. This recommendation is consistent with UNESCO and the International Task Force on Teachers for Education 2030 (2024), which examined teacher shortages and the transformation of the teaching profession, highlighting the broader importance of strengthening teacher support systems to improve educational provision. Parents and guardians may assist learners by encouraging independent practice and providing available learning materials. The proposed instructional enhancement plan should address identified resource, instructional, and learner-support needs, with its implementation and effectiveness evaluated to guide further improvements.

The study was limited to 98 Grade 10 TLE Dressmaking learners and 12 teachers from selected public secondary schools in the First Congressional District of Bohol during School Year 2026–2027. It excluded other grade levels, TLE specializations, and schools outside the identified research locale. The assessment focused on participants' perceived effectiveness of blended instruction rather than direct measurements of actual academic achievement or demonstrated competency outcomes. Consequently, the findings reflect the experiences and perceptions of the participating respondents and may not be generalizable to other educational settings. Future studies may include broader populations and direct competency assessments to further examine the effectiveness of blended instruction.

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