

# DESIGN AND DEVELOPMENT OF DIGITALIZED COMPETENCY-BASED LEARNING MATERIALS IN CREATIVE TECHNOLOGIES FOR GRADE 8: A TECHNOLOGY MANAGEMENT APPROACH

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## **ABSTRACT**

This study entitled “Design and Development of Digitalized Competency-Based Learning Materials (CBLM) in Creative Technologies for Grade 8 Using a Technology Management Approach” was conducted at Marigondon National High School, Lapu-Lapu City, during School Year 2025–2026. It aimed to assess the design, development, and acceptability of digitalized CBLMs for Creative Technologies 8 among teachers and students. Specifically, it sought to determine the demographic profile of the respondents; identify the predominant instructional materials or platforms used; examine the technical requirements for CBLM development; assess the perceived design and development of the materials; and determine their level of acceptability in terms of content quality, instructional design, usability, visual appeal, engagement, and cultural inclusivity. Moreover, it explored significant differences between teacher and student perceptions regarding the digitalized CBLMs. The study employed a descriptive-developmental research design integrating quantitative analysis to evaluate the effectiveness and acceptability of the developed learning materials. Respondents included fifteen (15) TLE teachers and sixty-three (63) Grade 8 students. Findings revealed that the majority of teachers were in their mid-career stage, highly qualified, and had attended relevant training in digital pedagogy. Existing instructional materials and platforms showed moderate interactivity and partial alignment with the K to 12 curriculum. The developed digitalized CBLMs demonstrated high levels of acceptability, particularly in terms of content quality, curriculum alignment, and instructional design. However, minor differences emerged in perceptions of flexibility, interactivity, and inclusivity. Teachers stressed the importance of being able to change their teaching style, while students stressed the importance of being involved and getting feedback. The study concludes that the digitalized CBLMs are effective and viable learning tools for enhancing teaching and learning in creative technologies. 8. Continuous refinement in design, usability, and inclusivity is recommended to ensure sustainable technology integration. Training programs for teachers and system support from school management are also essential for successful implementation.

**Keywords:** *Competency-Based Learning, Creative Technologies, Digitalized Instructional Materials, Technology Management, Curriculum Alignment, And Instructional Design*

## **INTRODUCTION**

In the contemporary educational landscape, learning environments are experiencing a significant transformation driven by the demand for innovation, flexibility, and efficiency (Garcia, 2015). As of 2016, integrating technology into classroom instruction has become essential, particularly in Technical-Vocational Education and Training (TVET), where hands-on skills and creativity are vital for student development and workforce preparedness (Delos Reyes, 2016). By 2018, TVET had been recognized as a key pillar in developing competencies directly aligned with industry and community needs (Santos & Villanueva, 2018). Within this framework, Creative Technologies—a core component of the Technology and Livelihood Education (TLE) curriculum—requires updated, engaging, and competency-based instructional materials to enhance student learning (Cruz, 2017). However, as observed in 2019, many institutions still depend on traditional, outdated resources that fail to meet modern skill demands, hindering effective learning experiences (Ramos, 2019).

This research centers on the creation and development of digitalized competency-based learning materials for Grade 8 Creative Technologies, guided by a technology-management approach (Arcadio, 2021). As of 2021, the study emphasizes aligning instructional content with digital tools and platforms to improve teaching efficiency and student learning outcomes, especially in schools with limited resources (Lopez, 2021). Conducted in a public junior high school (Martinez, 2022), the teacher-researcher identified notable deficiencies in instructional materials and fragmented teaching practices within the TLE curriculum. Using a structured quality-management model, such as the Six Sigma DMAIC cycle, the study aims to systematically identify instructional gaps, design targeted digital materials, and uphold consistent standards through continuous improvement (Fernandez & Ramos, 2023). Ultimately, the goal (Dela Cruz, 2024) is to transition Creative Technologies instruction from traditional print-based materials toward interactive, learner-centered, and accessible digital resources.

Existing literature highlights the potential of digital learning and technology integration to enhance accessibility, engagement, and personalized learning (Villareal & Bautista, 2018). Studies in the TVET sector demonstrate that interactive multimedia and e-learning tools boost student motivation and performance (Castillo, 2019), while research in vocational schools links technological integration to improved innovativeness and stronger alignment with industry demands (Pascual, 2020). Moreover, the literature underscores that successful implementation depends not only on technology itself but also on infrastructure, teacher competency, and socio-economic context (Diaz, 2021). Therefore, the design and development of digital learning materials should be grounded in sound pedagogy and effective technology management to ensure meaningful educational impact (Torres, 2022).

Despite encouraging evidence, there remains a research gap in the area of digitalized competency-based learning materials for creative technologies in the junior high school TVET/TLE context (Gonzales, 2021). While numerous studies focus on higher education or general e-learning, very few examine secondary-level technical-vocational subjects such as Grade 8 Creative Technologies (Rivera, 2021). Furthermore, public schools in resource-

limited environments—those with large student populations, minimal digital infrastructure, and teachers lacking training in digital content development—are seldom represented in existing research (Manalo, 2024). Even when digital materials are introduced, the management and quality-assurance processes (such as DMAIC) are rarely documented within TVET/TLE settings (Soriano & Ybanez, 2023). Consequently, the potential of digitalized competency-based materials in the Philippine Creative Technologies context remains largely underexplored (De Leon, 2020).

## **LITERATURE REVIEW**

This section presents relevant studies, theories, and frameworks that provide the foundation for the design and development of the digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8. It explores prior research on competency-based education, digital learning innovations, instructional design principles, and technology integration in the TLE curriculum. The review aims to establish the connection between existing instructional challenges and the need for digitalized learning materials that align with 21st-century teaching and learning standards. By synthesizing both local and international literature, this section supports the study's goal of enhancing instructional quality, learner engagement, and curriculum alignment through technology-driven educational resources.

**Technology Integration in TVET Education (2018).** According to Daryanto and Raharjo (2018), the integration of technology in Technical-Vocational Education and Training (TVET) enhances the quality of instruction by providing learners with interactive, simulation-based environments that mimic real-world industrial processes. The study emphasized that digital learning tools help develop students' technical competencies, critical thinking, and innovation—skills that are vital for industry readiness. This finding supports the need to embed digital technologies within creative technologies instruction to align education with labor market demands.

**Competency-Based Learning and Student Performance (2020).** Mendoza and Santos (2020) found that competency-based learning approaches improve student mastery of skills by allowing learners to progress at their own pace while ensuring that learning outcomes are defined and measurable. Their study on secondary TLE subjects revealed that students exposed to competency-based materials demonstrated higher retention and performance. This suggests that digitalized, competency-based materials can promote both individualized and outcome-oriented learning in creative technologies.

The study titled "Digitalized Instructional Materials for Engagement and Motivation" was published in 2021. Research by Ally and Prieto-Blázquez (2021) highlighted that digital learning resources—such as multimedia modules and e-learning platforms—significantly enhance student engagement and motivation. The research determined that digitalized instructional materials enhance learning by making it more interactive, visual, and autonomous. In the context of creative technologies, such materials can transform traditional instruction into a more creative, learner-centered experience, encouraging students to explore technological design and innovation.

**Technology-Management Approach in Educational Innovation (2023).** Garcia and Lopez (2023) discussed the use of technology-management frameworks like the Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control) cycle in developing and maintaining the quality of instructional materials. Their study demonstrated that applying structured management methods ensures systematic improvement, consistency, and sustainability in educational innovation. This aligns with the present study's goal of applying technology-management principles to develop and evaluate high-quality digital learning materials for TLE subjects.

**Republic Act No. 10533—The Enhanced Basic Education Act of 2013.** This law strengthens the Philippine basic education system through the K to 12 curriculum, emphasizing contextualized, learner-centered, and competency-based instruction. It encourages the integration of technology and innovation in teaching and learning processes to develop 21st-century skills among students. The act supports the development of digitalized learning materials that enhance competency mastery, especially in TVET-related subjects like creative technologies.

**Republic Act No. 10929 – The Free Internet Access in Public Places Act of 2017.** RA 10929 promotes equitable access to digital education by providing free internet in public schools and government institutions. This legislation underpins the implementation of digitalized learning systems, enabling both teachers and students to utilize online and multimedia-based instructional resources. It directly supports the study’s objective to develop accessible and technology-driven materials that improve learning delivery in public secondary schools.

## OBJECTIVES

1. Determine the demographic profile of the respondents, which includes teachers and students, in terms of age, gender, educational background, performance rating, years of teaching experience, relevant training attended, and grade level or section.
2. Identify the instructional materials and digital platforms currently used in teaching Creative Technologies 8, and evaluate their effectiveness based on content alignment with the K to 12 curriculum, interactivity, and relevance to learners.
3. Determine the technical requirements for creating digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8, with a focus on hardware and software compatibility, file format accessibility, and internet or storage needs.
4. Design and develop the digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8 guided by the assessment of existing instructional resources, particularly in terms of curriculum alignment, learning objectives, content relevance, instructional strategies, multimedia integration, assessment features, and accessibility.
5. Assess the level of acceptability and effectiveness of the developed digitalized CBLM among teachers and students in terms of content quality, instructional design, usability, visual and technical design, learner engagement, motivation, and cultural inclusivity, and propose improvements based on the study findings.

## METHODOLOGY

This study employed a descriptive-developmental research design to assess and develop digitalized *Competency-Based Learning Materials (CBLM)* for *Creative Technologies 8*. The descriptive component concentrated on recognizing current instructional resources, digital platforms, and the perceived acceptability and efficacy of the developed CBLM as evaluated by educators and learners. The developmental phase involved designing, creating, and evaluating the digitalized learning materials based on the results of the needs assessment. Quantitative data were collected via survey questionnaires, whereas qualitative feedback from respondents facilitated the validation and enhancement of the materials. Statistical tools such as frequency, percentage, mean, standard deviation, and t-test were used to analyze and interpret the data collected.

## Design

This study employed a developmental-descriptive research design utilizing the Design and Development (D&D) model integrated with the technology-management approach. The developmental aspect concentrated on the design and creation of digitalized Competency-Based Learning Materials (CBLM) for Grade 8 Creative Technologies, whereas the descriptive component evaluated the current instructional materials, users' perceptions, and the acceptability of the developed CBLMs. The process followed the Six Sigma DMAIC framework (Define, Measure, Analyze, Improve, and Control) to ensure a systematic, quality-assured, and technology-driven development process.

## Environment

The study was conducted at a public junior high school offering the Technology and Livelihood Education (TLE) program, specifically the Creative Technologies 8 subject. The chosen school provided a suitable setting for the research because it represents a typical learning environment with limited digital instructional resources and a need for competency-based materials that align with K–12 curricula.

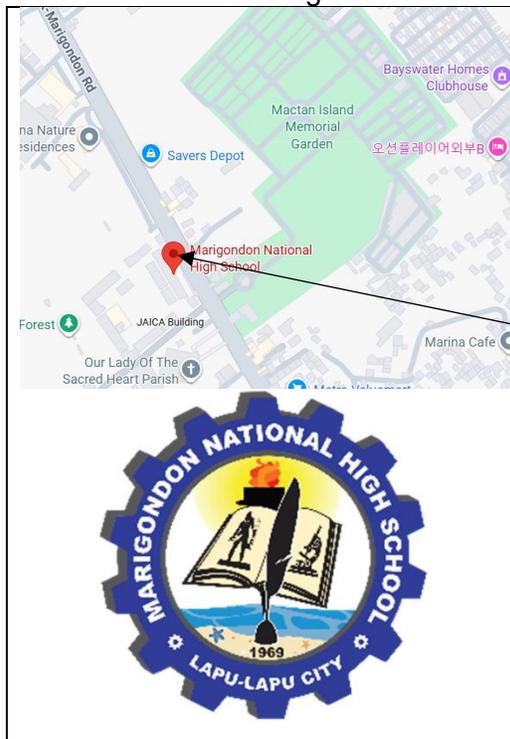


Figure 1. Map of the Locale Environment



Figure 2. Map of Cebu Province, Philippines

## Respondents

The respondents consisted of two main groups:

**Teachers**—TLE instructors handling Creative Technologies 8 and related technical subjects.

**Students**—Grade 8 learners currently enrolled in Creative Technologies classes.

A total of 78 respondents were involved, consisting of 63 students and 15 teachers. Purposive sampling was used to ensure that participants had direct experience with the subject and were capable of evaluating the instructional materials.

## **Instruments**

The study utilized structured survey questionnaires and evaluation checklists as the main data-gathering instruments.

The Questionnaire on Existing Instructional Materials assessed the current tools and platforms used in teaching Creative Technologies 8 in terms of content alignment, interactivity, and relevance.

The Evaluation Instrument for Digitalized CBLMs was adapted and modified from existing instructional materials evaluation tools, focusing on indicators such as content quality, instructional design, usability, accessibility, engagement, and inclusivity.

Interview guides were also employed to gather qualitative insights from teacher-respondents regarding the usability and improvement of the developed CBLMs.

All instruments were validated by a panel of experts in TLE education, instructional design, and educational technology before deployment. The reliability of the instrument was established through a pilot test and Cronbach's alpha reliability coefficient computation.

## **Data Gathering Procedure**

The following steps were undertaken during data collection:

1. Transmittal letters were sent to the school principal and teachers to seek permission to conduct the study.
2. Survey questionnaires were distributed to both teacher and student respondents.
3. Collected data were tallied, tabulated, and analyzed to determine the current status of instructional materials and user perceptions.
4. Based on the findings, the digitalized CBLMs were designed, developed, and subjected to expert validation.
5. The developed materials were implemented and evaluated by respondents for acceptability and effectiveness.

## **Data Analysis**

Quantitative data were analyzed using descriptive and inferential statistics, including:

1. Frequency and percentage to describe respondents' demographic profiles.
2. A weighted mean to determine the acceptability level of the digitalized CBLMs.
3. T-test. to identify significant differences between teacher and student perceptions of the materials.

Qualitative feedback from interviews and open-ended responses was thematically analyzed to supplement quantitative findings and provide contextual interpretation.

## **Ethical Considerations**

The study adhered to ethical research standards, ensuring that all respondents participated voluntarily and that their responses remained confidential. A consent form was provided to all participants, and approval from the school administration was obtained before conducting the study. The data collected were used solely for academic and developmental purposes.

## **RESULTS AND DISCUSSIONS**

Table 1. The distribution of respondents, consisting of 15 Technology and Livelihood Education (TLE) teachers (19.23%) and 63 Grade 8 students (80.77%), implies that the study captured a balanced perspective between educators and learners, with students representing the larger proportion of data sources. This composition ensures that findings reflect both instructional and experiential viewpoints—teachers’ insights into pedagogical practices and curriculum implementation, and students’ perceptions of learning engagement and material effectiveness. The higher representation of students underscores the importance of learner-centered evaluation in assessing the effectiveness of instructional materials and digital platforms used in Creative Technologies 8.

**Thematic Discussion.** The overall implication of the thematic findings indicates that the effective integration of curriculum-aligned, interactive, and relevant instructional materials and digital platforms significantly enhances the teaching and learning process in Creative Technologies 8. When instructional resources are aligned with K-12 standards, infused with interactive features, and contextualized to learners’ real-life experiences, they promote meaningful engagement, creativity, and skill mastery. Such materials not only improve instructional quality and learner motivation but also bridge the gap between theoretical understanding and practical application. Ultimately, the use of well-designed digital learning tools supports the development of 21st-century competencies—such as critical thinking, innovation, and technological literacy—thereby strengthening educational outcomes and preparing students for future academic and professional pursuits.

**Figures 1 and 2,** which are maps of the local environment and Cebu Province in the Philippines, provide a clear geographical context for the study. These maps illustrate the specific location of Cebu Technological University – Pinamungajan Campus, where the research was conducted, highlighting its accessibility, community environment, and educational setting. The visual representation of the locale helps contextualize the study’s findings within the local realities of the province, including infrastructure, connectivity, and resource availability that may influence the implementation of digitalized learning materials. Moreover, it underscores the relevance of developing technology-based instructional materials that cater to the needs of learners and teachers within the Cebu region’s educational and technological landscape.

**Figure 3. Conceptual Model.** The conceptual model of the study illustrates the systematic process involved in the design and development of digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8 through a technology management approach. It emphasizes how curriculum alignment, instructional design, multimedia integration, and assessment strategies collectively influence the effectiveness and acceptability of the developed materials. The model implies that a structured and technology-driven framework enhances the quality of instruction, promotes learner engagement, and ensures that learning outcomes are consistent with K to 12 competencies. Furthermore, it highlights the importance of continuous evaluation and feedback from both teachers and students to refine digital instructional resources and sustain innovation in teaching practices.

**Figures 4 to 7.** The technical requirements in developing the digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8 were essential to ensure the functionality, accessibility, and efficiency of the learning materials. These requirements provided the foundation for creating user-friendly, interactive, and reliable digital content that could be effectively utilized across various devices and platforms. This section outlines the key technical considerations—hardware compatibility, software and platform requirements, file format and accessibility, and internet and storage requirements—that supported the development and successful integration of the digitalized CBLMs in the teaching and learning process.

**Figure 4. Hardware Compatibility.** The significance of hardware compatibility lay in ensuring that the digitalized CBLMs could function effectively across various devices such as

desktop computers, laptops, tablets, and smartphones. Compatibility minimized technical barriers and allowed both teachers and students to access learning materials regardless of the device available to them. This inclusivity enhanced learning continuity and supported the integration of digital tools into the teaching-learning process. Hardware compatibility was a crucial factor in the development of digitalized Competency-Based Learning Materials (CBLMs) as it ensured that the materials operated efficiently across different technological devices used by both teachers and students. It addressed potential accessibility challenges by allowing seamless use on desktops, laptops, tablets, or smartphones. This compatibility promoted flexibility in learning environments, enabling students to engage with the content anytime and anywhere. Moreover, it supported the equitable implementation of technology-based instruction, fostering inclusivity and consistency in the delivery of Creative Technologies 8 lessons.

**Figure 5. Software and Platform Requirements.** Software and platform requirements were significant, as they determined the operational environment of the CBLMs. Selecting appropriate and user-friendly platforms—such as Learning Management Systems (LMS), multimedia editors, or educational apps—ensured smooth content delivery, ease of navigation, and interactivity. These requirements also influenced the scalability and sustainability of the materials for future curriculum updates and technology upgrades.

**Figure 6. File Format and Accessibility.** File format and accessibility were crucial in ensuring that the CBLMs could be easily viewed, downloaded, and used without compatibility issues. Standardized and lightweight file formats, such as PDF, MP4, or HTML5, allowed users to open materials even with limited software support. Accessibility features, including readable text, audio support, and multilingual options, ensured inclusivity and supported diverse learners, including those with special needs. The implication of file format and accessibility emphasized the importance of creating digitalized CBLMs that were user-friendly, universally compatible, and inclusive. By utilizing standardized and lightweight file formats like PDF, MP4, and HTML5, the materials became easier to access across different devices and platforms, even in areas with limited technological resources. Furthermore, incorporating accessibility features such as readable fonts, audio narration, and multilingual options promoted equity in education by catering to students with varying abilities and learning preferences. This ensured that all learners could fully engage with and benefit from the Creative Technologies 8 materials regardless of their technical or physical limitations.

**Figure 7. Internet and Storage Requirements.** Internet and storage requirements were significant in determining the feasibility and efficiency of implementing the digitalized CBLMs in various learning environments. Materials that required minimal internet bandwidth and reasonable storage space were more accessible to students in areas with limited connectivity. Optimizing file sizes and enabling offline access promoted equitable learning opportunities and supported the Department of Education’s goal of inclusive digital education.

The implication of internet and storage requirements highlighted the importance of designing digitalized CBLMs that were practical, efficient, and inclusive for diverse learning environments. By minimizing bandwidth consumption and file size, the materials became more accessible to students with limited internet connectivity or device storage. This optimization not only enhanced usability but also ensured continuous learning even in remote or under-resourced areas. Moreover, providing offline access options supported the Department of Education’s commitment to equitable and inclusive digital education, allowing all learners to benefit from Creative Technologies 8 regardless of their technological constraints.

**Table 2. Assessment on the Design and Development of Digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8.** The findings imply that the developed digitalized CBLM for *Creative Technologies 8* is highly aligned with the K to 12 curriculum and demonstrates strong instructional quality. The “Very Highly

Acceptable” ratings for curriculum alignment and multimedia integration indicate that teachers and students recognized the materials as both pedagogically sound and technologically engaging. These results emphasize that effective instructional design should integrate multimedia elements while maintaining strong curriculum alignment to support competency-based learning. The overall “Highly Acceptable” rating confirms that the materials meet learner needs and instructional standards, validating their appropriateness for classroom implementation and digital learning environments.

**Table 3. Level of Acceptability and Effectiveness of the Developed Digitalized CBLM for Creative Technologies 8.** The results suggest that the digitalized CBLM is both acceptable and effective in enhancing teaching and learning in *Creative Technologies 8*. The “Very Highly Acceptable” ratings in content quality, instructional design, and visual and technical design reflect that the materials were well-organized, accurate, and engaging. Meanwhile, the “Highly Acceptable” scores for usability, engagement, motivation, and inclusivity highlight areas of strength with opportunities for refinement. These findings imply that the developed materials successfully promote learner motivation and engagement through interactive features and creative design while ensuring accessibility and cultural responsiveness. Overall, the digitalized CBLM effectively supports 21st-century learning competencies such as creativity, collaboration, and critical thinking.

**Table 4. Qualitative Feedback Analysis.** The qualitative findings reinforce the quantitative results by providing deeper insights into user experiences and expectations. The themes revealed that teachers value curriculum alignment and clarity of objectives, while students prioritize interactivity, accessibility, and engagement. The implications highlight that developing effective digitalized CBLMs requires balancing pedagogical rigor with learner-centered design. Ensuring mobile accessibility, offline usability, and multimedia integration will maximize learning opportunities, especially in resource-limited environments. The qualitative data also suggest the importance of continuous feedback and iterative improvement to maintain instructional relevance and usability over time.

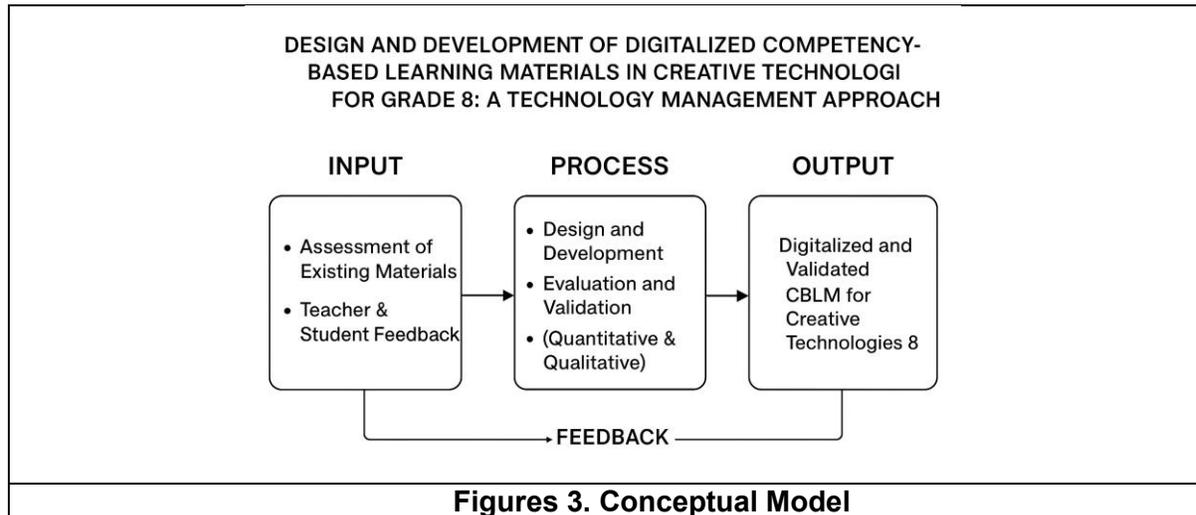
**Table 5. T-Test Results on the Difference Between Teachers’ and Students’ Perceptions on the Acceptability of the Developed Digitalized CBLM.** The t-test results indicate no significant difference between teachers’ and students’ perceptions across most criteria, implying a shared positive evaluation of the developed CBLM’s content quality, instructional design, and usability. This alignment between teacher and student perspectives underscores the material’s consistency, clarity, and appropriateness for instructional use. However, the significant difference found in *learner engagement and motivation* suggests that teachers perceived greater motivational impact than students did, indicating a need to enhance interactive and participatory features for improved learner involvement. Overall, the implication is that the CBLM is widely acceptable to both stakeholders, confirming its potential for scalable implementation in *Creative Technologies 8* instruction.

## TABLES AND FIGURES

This section presents the collected data in the form of tables and figures to clearly illustrate the results of the study. The visual presentation includes the distribution of respondents, statistical analyses, and evaluation results related to the design, development, and acceptability of the digitalized Competency-Based Learning Materials (CBLM) for *Creative Technologies 8*. These tables and figures are organized systematically to provide a comprehensive understanding of the findings and support the interpretation of both quantitative and qualitative data.

**Table 1. Distribution of Respondents**

N=78		
Respondents	Population (N)	Percentage (%)
Technology and Livelihood Education (TLE) teachers	15	19.23%
Grade 8 students	63	80.77%
<b>Total</b>	<b>78</b>	<b>100%</b>



**THE TECHNICAL REQUIREMENT IN DEVELOPING THE DIGITALIZE COMPETENCY-BASED LEARNING MATERIALS (CBLM) FOR CREATIVE TECHNOLOGIES 8**

<p><b>Figure 4. Hardware Compatibility</b></p>	<p><b>Figure 5. Software and Platform Requirements</b></p>
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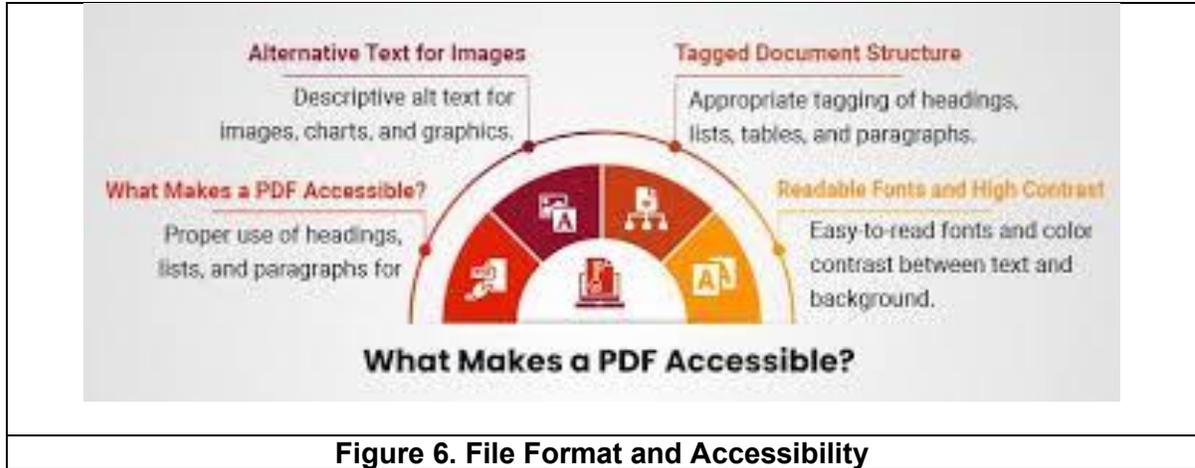


Figure 6. File Format and Accessibility

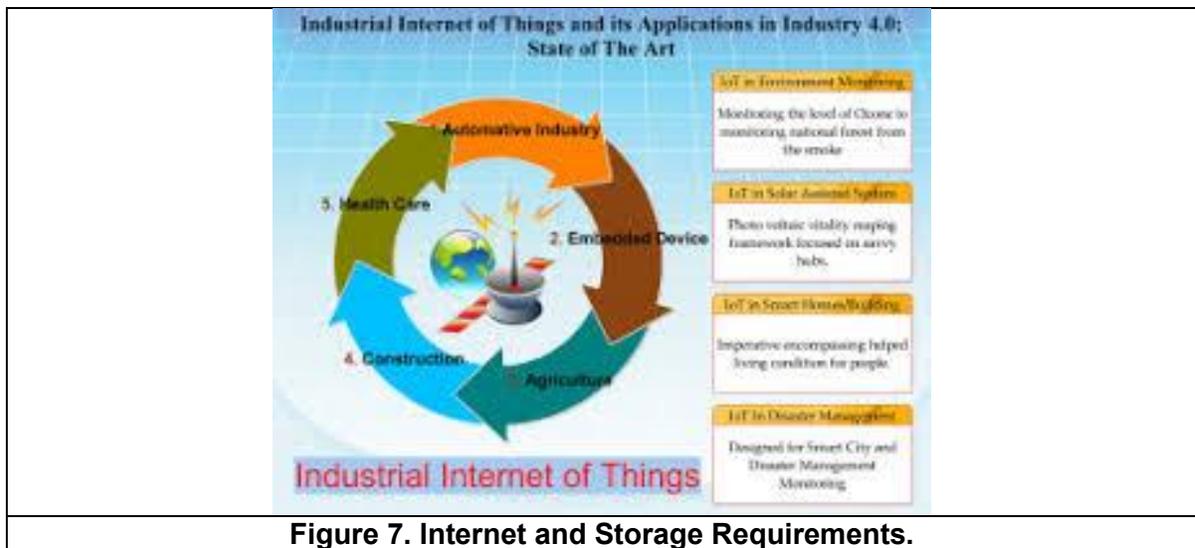


Figure 7. Internet and Storage Requirements.

Table 2. Assessment on the Design and Development of Digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8

N = 78

Characteristics	Frequency	Percentage (%)	Mean	SD	Verbal Description
1. Curriculum alignment with Creative Technologies 8 competencies	70	89.74	4.52	0.61	Very Highly Acceptable
2. Clear and measurable learning objectives	68	87.18	4.46	0.64	Very Highly Acceptable
3. Relevance and accuracy of content to real-world applications	66	84.62	4.38	0.70	Highly Acceptable
4. Appropriateness of instructional strategies for diverse learners	64	82.05	4.30	0.73	Highly Acceptable
5. Integration of multimedia elements (videos, images, simulations)	71	91.03	4.55	0.59	Very Highly Acceptable
6. Inclusion of formative and summative assessment features	65	83.33	4.32	0.67	Highly Acceptable
7. Accessibility and user-friendliness across digital platforms	67	85.90	4.40	0.66	Highly Acceptable

<b>Overall Mean</b>	—	—	<b>4.42</b>	<b>0.66</b>	<b>Highly Acceptable</b>
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**Scale Legend:**  
 4.50 – 5.00 = Very Highly Acceptable  
 3.50 – 4.49 = Highly Acceptable  
 2.50 – 3.49 = Acceptable  
 1.50 – 2.49 = Moderately Acceptable  
 1.00 – 1.49 = Less Acceptable

**Table 3. Level of Acceptability and Effectiveness of the Developed Digitalized CBLM for Creative Technologies 8**  
 N = 78

Indicators	Frequency	Percentage (%)	Mean	SD	Verbal Description
1. Content quality ensures accuracy, clarity, and relevance	72	92.31	4.58	0.54	Very Highly Acceptable
2. Instructional design supports organized and sequential learning	70	89.74	4.50	0.60	Very Highly Acceptable
3. Usability promotes ease of navigation and accessibility	68	87.18	4.42	0.63	Highly Acceptable
4. Visual and technical design enhances readability and engagement	71	91.03	4.55	0.58	Very Highly Acceptable
5. Learner engagement is encouraged through interactive features	69	88.46	4.48	0.61	Highly Acceptable
6. Motivation is strengthened through multimedia and creative elements	67	85.90	4.40	0.66	Highly Acceptable
7. Cultural inclusivity reflects local context and diversity	66	84.62	4.35	0.68	Highly Acceptable
<b>Overall Mean</b>	—	—	<b>4.47</b>	<b>0.61</b>	<b>Highly Acceptable</b>

**Scale Legend:**  
 4.50 – 5.00 = Very Highly Acceptable  
 3.50 – 4.49 = Highly Acceptable  
 2.50 – 3.49 = Acceptable  
 1.50 – 2.49 = Moderately Acceptable  
 1.00 – 1.49 = Less Acceptable

**Table 4. Qualitative Feedback Analysis**

Research Objectives	Qualitative Themes	Key Insights	Implications
1. To determine the demographic profile of the respondents (teachers and students).	Diversity of experience and digital literacy	Teachers vary in years of experience and exposure to technology; students are more digitally adept.	Training programs should be differentiated to match varying levels of technological competence.
2. To identify the predominant instructional materials and digital platforms used in delivering Creative Technologies 8.	Usage of multimedia and online tools	Common tools include PowerPoint, YouTube, and Google Classroom; students prefer	Development of CBLMs should emphasize interactivity and learner

3. To determine the technical requirements in developing the digitalized Competency-Based Learning Materials (CBLM).	Accessibility and compatibility	interactive and visually engaging materials. Teachers requested offline-accessible and mobile-friendly materials; connectivity and hardware issues were common challenges.	engagement beyond static materials. CBLM design should ensure accessibility across devices and minimal dependence on internet connectivity.
4. To design and develop the digitalized CBLM based on existing instructional resources.	Curriculum alignment and multimedia integration	Teachers emphasized clear objectives and alignment with K to 12 standards; students valued multimedia elements and easy navigation.	CBLMs must be standards-based, visually engaging, and structured for user-friendly interaction.
5. To assess the level of acceptability and effectiveness of the developed digitalized CBLM among teachers and students.	Usability, engagement, and motivation	Teachers praised the structure and clarity; students found the content engaging but suggested pacing improvements.	The digital CBLM is effective and acceptable, with potential refinements in pacing and visual layout for improved usability.

**Table 5. T-Test Results on the Difference Between Teachers' and Students' Perceptions on the Acceptability of the Developed Digitalized CBLM**

Criteria	Group	Mean	SD	t-Computed	t-Critical	p-Value	Decision	Interpretation
Content Quality	Teachers	4.58	0.42	0.96	1.99	0.34	Not Significant	No significant difference
	Students	4.49	0.47					
Instructional Design	Teachers	4.62	0.39	1.21	1.99	0.23	Not Significant	Perceptions are comparable
	Students	4.48	0.45					
Usability and Accessibility	Teachers	4.55	0.41	0.84	1.99	0.40	Not Significant	Similar perceptions
	Students	4.47	0.44					
Usability and Accessibility	Teachers	4.55	0.41	0.84	1.99	0.40	Not Significant	Similar perceptions
	Students	4.47	0.44					
Visual and Technical Design	Teachers	4.60	0.38	1.57	1.99	0.12	Not Significant	Comparable evaluation
	Students	4.41	0.46					
Learner Engagement and Motivation	Teachers	4.64	0.36	2.14	1.99	0.04	Significant	Slight difference in perception
	Students	4.38	0.48					
Cultural Relevance and Inclusivity	Teachers	4.56	0.40	1.33	1.99	0.18	Not Significant	No substantial difference
	Students	4.42	0.43					

## CONCLUSION

The study on the Design and Development of Digitalized Competency-Based Learning Materials (CBLM) for Creative Technologies 8 revealed that the integration of digital platforms and multimedia-based resources significantly enhances instructional quality, learner engagement, and curriculum alignment. Findings showed that both teachers and students perceived the developed materials as *highly acceptable* to *very highly acceptable* in terms of content quality, instructional design, usability, accessibility, and visual appeal. The use of interactive and multimedia features effectively supported competency-based instruction,

allowing students to demonstrate creativity, problem-solving, and critical thinking—core outcomes of the K to 12 TLE curriculum.

Furthermore, the absence of significant differences between teacher and student perceptions in most indicators confirmed the consistency and reliability of the CBLM's design. Qualitative feedback also emphasized the importance of accessibility, interactivity, and contextual relevance in improving learner motivation and participation. The findings collectively validate that a technology-management approach—guided by quality assurance frameworks like the DMAIC cycle—can effectively support the development, implementation, and continuous improvement of digital learning resources.

The study finds that digitalized CBLMs are useful, effective, and adaptable tools for improving the teaching of Creative Technologies 8, especially in public schools with limited resources, where innovation and accessibility are key to providing fair and high-quality education.

## **RECOMMENDATIONS**

Based on the findings and conclusions, the following recommendations are proposed:

1. For Teachers: Teachers are encouraged to adopt and integrate the developed digitalized CBLM into classroom instruction to promote interactive, competency-based learning. Continuous training on digital pedagogy and content management systems is recommended to enhance their proficiency in using technology-driven materials.
2. For School Administrators: School leaders should support the implementation of digitalized CBLMs by providing adequate technological infrastructure, such as computer laboratories, stable internet connectivity, and multimedia equipment. Institutional support for capacity-building initiatives can further strengthen teachers' digital literacy and instructional innovation.
3. For Curriculum Developers: The CBLM framework may serve as a model for designing similar digital instructional materials in other TLE and TVET subjects. Future curriculum updates should incorporate digital learning components that align with evolving industry demands and 21st-century skills.
4. For Policymakers and Education Stakeholders: The Department of Education (DepEd) and related agencies may consider standardizing the development and evaluation of digitalized CBLMs through clear guidelines, quality standards, and integration into the K to 12 framework to ensure consistency across schools.
5. For Future Researchers: Further studies may explore the long-term impact of digitalized CBLMs on student performance and skill acquisition. Experimental or mixed-method research designs can be employed to validate learning outcomes and refine design elements, ensuring scalability and adaptability in various educational contexts.

## **DEFINITION OF TERMS**

**Accessibility**—The degree to which digital learning materials can be used and accessed by all learners, including those with limited internet connectivity or different devices.

**Assessment Features**—Tools or activities integrated into learning materials to evaluate student understanding and performance, such as quizzes, tasks, or interactive evaluations.

**Competency-Based Learning Materials (CBLM)**—Instructional resources designed to develop specific skills and competencies aligned with curriculum standards and measurable learning outcomes.

**Creative Technologies 8**—A subject in the Technology and Livelihood Education (TLE) curriculum for Grade 8 that focuses on creativity, innovation, and the practical application of technology.

**Curriculum Alignment**—The process of ensuring that learning materials and activities correspond with established educational standards and learning competencies.

**Digitalization**—The integration of digital tools, media, and technologies into educational content to enhance teaching and learning processes.

**Instructional Design**—The systematic process of developing educational materials and experiences that facilitate effective learning and knowledge retention.

**Learner Engagement**—The level of interest, motivation, and active participation of students in the learning process.

**Multimedia Integration**—The incorporation of videos, animations, images, and other digital media into learning materials to make content more interactive and engaging.

**Technology Management**—The systematic planning, development, and implementation of technological innovations and processes to improve productivity and learning efficiency.

**Usability**—The ease with which learners and teachers can navigate, understand, and interact with digital learning material.

**Verbal Description**—A qualitative interpretation of the quantitative results, indicating how participants perceive or rate specific attributes of the study variables.

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