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Effectiveness of Project-Based Learning Material in Entrepreneurship and Entrepreneurial Skills of Grade 12 HUMSS Students

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Abstract

Aim: This study aimed to determine the effectiveness of the developed Project-Based Learning Material in the entrepreneurial skills performance of the learners using the project-based learning approach.
Methodology: The study used both descriptive-comparative and correlations research designs in conducting the study. This focused on describing the significant content of the developed Project-Based Learning Material and its effectiveness in the teaching and learning process.
Results: The result of the study reveals that the featured contents of the Project-Based Learning Material namely learning targets, learning activities, facts about the lesson, learning assessment and lesson structure are effective in improving entrepreneurial skills performance of students. Likewise, it shows a high level of effectiveness on quality assessment of skills performance using Project-Based Learning Material in terms of inquiry, designing, creation and evaluation. Further, findings resulted in a significant difference and a considerable increase in the entrepreneurial skills on critical thinking, collaborative and computational skills. However, findings illustrate no significant relationship between the respondents' perception of the content of the Project-Based Learning Material and the entrepreneurial skills performance. Also, no significant relationship between perceived effectiveness of PBLM quality assessment and entrepreneurial skills performance is revealed in the study.
Conclusion: The use of a project-based learning material in all disciplines is an easy way of teaching and learning and it develops the learning independence and self-proficiency among the learners.

Keywords: *Project-Based Learning Material, PBLM Content, Entrepreneurial Skills*

INTRODUCTION

The learning experience that exceptional instructors strive to facilitate for their students is one of "learning by doing." Many educators recognize the advantages of Project-Based Learning (PBL), which include heightened student engagement and the cultivation of workplace competencies. As a component of the PBL strategy, students collaborate over time to generate a final product, presentation, or performance that addresses a compelling and thought-provoking question. This approach hinges upon the formulation of an inspiring question and the provision of a solution that aptly addresses it.

As an educator aiming to employ a more suitable instructional strategy, I concur that the principle of "learning by doing," as advocated by John Dewey, is pivotal in the implementation of PBL. The guiding principles of PBL encompass the utilization of projects as the primary teaching tool and the establishment of students' roles as active participants in the learning process (a student-centered approach). According to Zdonek (2017), the central components of PBL encompass setting goals, delivering learning content in accordance with standards, and cultivating practical conceptual, technical, and social skills.

In the conventional framework of entrepreneurship education, practical skills development and the nurturing of entrepreneurial attitudes often receive lower priority compared to theoretical economic and financial knowledge (Siemieniak & Rebiasz, 2019). The PBL technique, which comprehensively enhances various practical abilities when

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tackling issues of theoretical or practical nature, can bridge this gap (Zdonek, 2017). Engaging in projects within and beyond the classroom through project-based learning stimulates students to refine and develop their entrepreneurial skills. This method necessitates instructors to foster a culture of creativity and engagement in the classroom, allowing students to share their work and critically analyze the steps they undertook to initiate and complete their projects (Cooper & Murphy, 2016). It moves away from the teacher-centered instructional approach, where students passively attend classes and rarely get the opportunity to translate their ideas into action or refine their entrepreneurial skills in real-world settings. Instead, PBL fosters the cultivation of critical thinking skills among students by engaging them through inquiry (Leat, 2017).

As established by a study conducted by Asmar Yulastri et al. (2017), uninteresting educators and inadequate textbooks dampen students' motivation to learn entrepreneurship in vocational schools. This is often due to the predictability of lecture content arising from the learning resources. To infuse greater engagement into entrepreneurial education within vocational settings, supplementary support is greatly warranted. This support could take the form of an entrepreneurship module.

In the context of entrepreneurship, Project-Based Learning offers a pathway for students to augment their entrepreneurial and critical thinking abilities concurrently. Another motivation behind the creation of this project-based learning material is that when students merely read a text and respond to comprehension questions, they are essentially demonstrating their capacity to recall and understand the reading material, as outlined in Bloom's revised taxonomy developed by Anderson and Krathwohl (2001). These two outcomes reside at the bottom tier of the taxonomy pyramid. Leveraging Project-Based Learning Material, we aim to nurture not only remembering and understanding but also critical thinking, creativity, collaboration, leadership, and computational skills among students.

One of the two researchers, a Senior High teacher and a Social Science major, conceived the idea of integrating DepEd-prescribed Project-Based Learning Material into the field of entrepreneurship due to her firsthand experience. She believes that HUMSS students require practical application of entrepreneurial skills across various domains, rather than solely focusing on skills aligned with their specific course.

The study seamlessly aligns with the principles outlined in the Department of Education's Handbook for Implementers (Department of Education, 2019). By embracing project-based learning as a foundational methodology and incorporating portfolios for reflection and assessment, this study endeavors to furnish concrete evidence of Grade 12 HUMSS students' heightened proficiency in entrepreneurship and entrepreneurial skills. The study's conceptual framework draws inspiration from the Handbook's emphasis on multidisciplinary competence development, student-driven topic selection, and real-world application through business planning. This alignment underscores the potential effectiveness of employing PBL and portfolio-based assessment to nurture practical understanding, skill acquisition, and holistic growth among students within the entrepreneurial realm.

Project-Based Learning (PBL) stands as an innovative pedagogical approach that encompasses a range of strategies crucial for success in the 21st century. It imparts real-world experience to students, initiates an extended process of inquiry, and enhances their interdisciplinary and communication proficiencies. However, prevailing PBL literature tends to emphasize internal learning more than external projects. Collaborative projects involving industrial partnerships forge alliances and provide opportunities to address genuine challenges, often employing diverse methodologies. This study examines and hypothesizes the benefits that students can derive from participating in entrepreneurship courses.

Given its role in fostering innovation and shaping the corporate landscape, entrepreneurship education has garnered substantial attention in recent times, both within political and academic spheres. Nevertheless, educators encounter challenges in formulating effective learning objectives, employing useful teaching methodologies, and devising means to evaluate the outcomes of these initiatives. "Global Considerations in Entrepreneurship Education and Training" offers an integrated approach to stimulate and support entrepreneurship, nurturing entrepreneurial competencies in students.

Significant learning took place beyond the classroom, where students acquired numerous skills vital for success in professional settings. The pupils reaped substantial benefits in terms of behavioral skills and qualities such as communication, self-assurance, English language proficiency, planning, critical thinking, and time management. Overall, project-based learning equipped students with a distinctive skill set that diverges from the conventional teaching and learning environment. This study's findings are anticipated to facilitate curriculum design and instructional pedagogy in higher education through context-specific implementation. The practical application of knowledge and employability is closely tied to PBL, with multiple findings suggesting that PBL equips students with skills that conventional classroom settings cannot provide. PBL fosters the development of professionalism through real-life scenarios, promoting self-directed learning and preparing students to tackle diverse challenges.

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This research endeavors to cultivate a well-rounded set of skills and competencies among business students, with several PBL-based courses integrated into the curriculum. From a social perspective, this study aligns with Oman's Vision 2040 and its capacity-building strategies, which aim to adopt innovative techniques for fostering individual and collective student growth, as well as lifelong learning. The originality and value of this research lie in its exploration of project-based learning, which provides educators with a pedagogical avenue to link K-12 education with real-world contexts. Particularly when students exhibit deficiencies or reservations in effectively grasping knowledge from traditional teaching methods, this study holds significant potential for educators to design curricula and facilitate projects.

To fulfill the objective of vocational education, a course on entrepreneurship utilizing the Product-Based Learning Approach was implemented. According to Zholdasbekova, et al. (2016), the execution of this module impacts students' ability to function autonomously and thrive within society. This notion is further supported by Fedorov and Tretyakova (2016) and Falco, et al. (2016).

Project-Based Learning (PBL) finds its theoretical foundations in various theories, prominently including Piaget's constructivism and Vygotsky's social constructivism. John Dewey's pedagogical creed has also significantly influenced its development (Kwitnewski, 2017). While Piaget never explicitly linked his theories to education, their applicability in educational settings is evident. The theory of discovery learning aligns with constructivism by highlighting that children learn most effectively through active exploration and hands-on experiences (McLeod, 2015). The utilization of constructivist theories nurtures an environment conducive to project-based learning.

The Zone of Proximal Development (ZPD), advanced by Vygotsky, holds that learning occurs in the gap between a learner's current level of development and the level achievable with the aid of tools and facilitation. Collaborating with peers or advanced individuals allows a student to tackle tasks beyond their current capabilities. This arrangement promotes future independent completion of higher-level tasks within their ZPD.

The genesis of the PBL methodology can be attributed to John Dewey, who championed "learning by doing" at the end of the 19th century (Dewey, 1938/1997). This concept was further elucidated by Dale's introduction of the "cone of experience" as a learning model in 1969. In alignment with Dewey's principle, this study adheres to the Inquiry and Design Cycle by Adam Campbell. This approach challenges students to research, develop, design, and evaluate solutions in response to real-world situations.

The fundamental purpose of this project-based learning material is to cultivate entrepreneurial prowess through a cognitive process involving the conceptualization, application, analysis, synthesis, and evaluation of information garnered from observation, experience, reflection, and communication, facilitated by the developed learning material.

The primary objectives of this study encompass enhancing the following abilities: 1) Critical thinking, encompassing deductive reasoning, source evaluation, and decision-making; 2) Originality and innovation-focused creativity; 3) Collaboration, leading to improved active listening, teamwork, debate participation, and cooperation skills; 4) Communication, which enhances oral and written communication, reading comprehension, and presentation skills; 5) Mathematical analysis, scientific research, econometrics, and statistics proficiency; 6) Flexibility, adaptability, and readiness for change; 7) Leadership skills, encompassing coordination, negotiation, delegation, coaching, and persuasion; 8) Entrepreneurial traits, including self-initiation, motivation, proactivity, curiosity, independence, and determination; 9) Resilience, persistence, problem-solving, root cause analysis, and problem management (Prufer and Prufer, 2019).

Examining Bloom's revised taxonomy developed by Anderson and Krathwohl (2001) underscores the need for students to engage in critical thinking, develop computational skills, and collaborate effectively during the learning process. These aspects correspond to the foundational layers of the taxonomy.

In today's education landscape, prioritizing critical thinking, problem-solving, creativity, communication, collaboration, and global awareness is imperative (Marjohan, 2013). Among these, critical thinking stands out as a key focus for contemporary schools.

In Project-Based Learning (PjB), projects serve as the central pivot, as asserted by Ratumanan (2015). These projects are challenging assignments grounded in complex questions or problems, necessitating students to design, solve problems, make decisions, or conduct investigative activities. They offer students the opportunity to work independently for extended periods, culminating in tangible outcomes and presentations.

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Objective

This research aimed to determine the relationship between the effectiveness of Project-Based Learning Materials and the Entrepreneurial Skills Performance of HUMSS Students from Lutucan Integrated National High School in Sariaya, Quezon.

This study intended to investigate and determine the following:

1. respondents' perceptions regarding the effectiveness of Project-Based Learning Materials in terms of; a) learning targets b) learning activities c) facts about the lesson d) learning assessment and e) lesson structure;
2. respondents' perceptions of the evaluated measures of skills performance of students using Project-Based Learning Materials were identified in terms of: a) inquiry b) design c) creation and d) evaluation;
3. the entrepreneurial skill level of the students before and after using the prescribed Project-Based Learning Materials in terms of: a) critical thinking b) computational skill and c) collaborative skill; and
4. significant difference in the skills performance of the students before and after using the Project-Based Learning Materials.

Hypothesis

Given the stated research problem, the following hypotheses were tested on 0.05 level of significance:

The following null hypotheses were investigated in this study.

Hypothesis 1: The students' skill performance before and after using the project-based learning material didn't differ significantly.

Hypothesis 2: The perceptions of the respondents regarding the degree of project-based learning material's efficacy and the performance of the students' entrepreneurial skills are not significantly correlated.

Hypothesis 3: The performance of students' entrepreneurial skills is not significantly correlated with the project-based learning material assessment measures.

METHODS

Research Design

This study employed a descriptive-comparative and correlational research design. The research typically sought to ascertain the efficacy of employing project-based learning materials to enhance students' performance in entrepreneurial abilities.

Population and Sampling

The research was conducted at Lutucan Integrated National High School in Sariaya, Quezon. The total number of students enrolled in this course was 195, but only ninety (90) Grade 12 HUMSS students were selected as the primary subjects for the research. A purposeful sampling strategy was employed to choose the respondents. Specifically, ninety (90) students were chosen from the Grade 12-HUMSS class, spanning both HUMSS 12-A and HUMSS 12-C sections. These respondents were selected because they were the only sections being taught Entrepreneurship by the researcher. Utilizing them as respondents in this study allowed for a more comprehensive involvement of the researcher in the teaching and learning process.

The involvement of the respondents was essential in evaluating the effectiveness of the Project-Based Learning Materials in Entrepreneurship in relation to their performance skills in the subject.

Instrument

The instruments included a pre-test and post-test, designed to align with the learning objectives of the Project-Based Learning Material (PBLM), and a survey questionnaire aimed at gauging students' perceptions of the PBLM's effectiveness and self-assessment of entrepreneurial skills. A panel of experts in entrepreneurship education provided content validation to ensure the instruments accurately measured the intended skills and concepts. Following this, a pilot test was conducted with a small group of students to identify and address any issues before the main data collection. Reliability analysis, specifically Cronbach's alpha, was employed to assess the internal consistency of the questions in both tests. This rigorous approach to instrument development and validation enhances the reliability and validity of the study's outcomes, enabling accurate assessment of the impact of PBLM on Grade 12 HUMSS students' entrepreneurial skills.

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Data Collection

The data were gathered, read, and analyzed following the objective of the study and in adherence to all protocols in the conduct of research.

1. **Instrument Preparation:** The survey questionnaire, pre-test, and post-test were meticulously crafted by the researcher for the Grade 12 HUMSS students, drawing inspiration from the Project-Based Learning Material (PBLM).
2. **Content Validation:** The research instruments underwent a rigorous validation process. A panel of experts, including Master Teachers and Head Teachers from the respondent school, critically reviewed and validated the instruments.
3. **Unified Group Testing:** Students from two HUMSS sections were considered as a single group of respondents. They collectively participated in both the pre-test and post-test evaluations, offering a consolidated perspective on the PBLM's impact on their entrepreneurial skills.
4. **Convenient Administration:** Survey questionnaires were thoughtfully administered to respondents at their convenience, ensuring a comfortable and conducive environment for honest responses.
5. **Data Collation:** The gathered data were systematically collated and organized. Through effective tabulation and arrangement into tables, the data were prepared for rigorous statistical treatment.

Treatment of Data

The researcher employed frequency counts to describe the personal profiles of the respondents. Standard deviation was used to measure the perceived effectiveness of project-based learning materials in relation to the measured entrepreneurial skills performance of the students. The Pearson Product Moment Correlation Coefficient was used to determine whether a significant relationship existed between the effectiveness of the learning materials and the level of skills performance of the students in entrepreneurship. Paired t-test statistics were used to ascertain the significant difference in the skills performance of the students in Entrepreneurship before and after using the Project-Based Learning Materials.

Ethical Considerations

Ethical considerations were meticulously addressed throughout the study. Informed consent was obtained from all respondents, including clear explanations of the study's purpose, procedures, and the right to withdraw. Respondents were assured of anonymity and confidentiality to encourage honest responses. The study prioritized minimizing harm to respondents, particularly the Grade 12 HUMSS students, by being sensitive to their well-being. Ethics committee approval was sought to ensure the study adhered to ethical standards. Data security measures were implemented to safeguard respondent privacy. Upon completion, respondents were provided with a debriefing to explain the study's purpose and offer an opportunity for questions and concerns. By adhering to these ethical principles, the study maintained its integrity and upheld respondents' rights and well-being.

RESULTS and DISCUSSION

Components of the Project-Based Learning Material

The components of project-based learning material (PBLM) comprise of five components, namely learning targets, learning activities, facts about the lesson, learning assessments and lesson structure. The level of effectiveness of the Project-Based Learning Material was evaluated through a survey questionnaire with corresponding criteria in each component. The criteria were rated as 4 for strongly agree, 3 for agree, 2 for disagree, and 1 for strongly disagree to measure the level of effectiveness.

Table 1
Summary Table on the Level of Perceived Effectiveness of Project-Based Learning Material Learning Components

Project-Based Learning Material	Mean	SD	Interpretation
Learning Targets	3.41	0.45	Effective
Learning Exercises	3.42	0.48	Effective

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Facts About the Lesson	3.4	0.44	Effective
Learning Assessment	3.56	0.42	Highly Effective
Lesson Structure	3.45	0.42	Effective
Overall	3.45	0.44	Effective

Legend: 3.50-4.00 highly effective, 2.50-3.49- Effective, 1.50-2.49-Moderately effective1.00-1.49 Not Effective At All

Table 1. This illustrates the summary of the student's perception of the level of effectiveness of Project-Based Learning Material in terms of its components.

Students rated the components based on mean scores and standard deviations. Notably, the learning assessment component garnered the highest positive feedback, with a mean score of 3.56 (SD = 0.42). This suggests that students found assessments valuable for clarifying performance expectations, motivating effort, fostering positive beliefs, and encouraging self-assessment. A study by Krajcik et al. (2022) emphasized that assessments in PBL play a vital role in promoting student engagement, providing clear benchmarks for performance, and fostering self-directed learning. The study highlighted the importance of assessment formats that encourage critical thinking and problem-solving skills, aligning with the positive sentiments expressed by students in this current study.

The lesson structure closely followed with a mean of 3.45 (SD = 0.42), highlighting its role in enhancing organization and learning experience. Students also responded positively to learning exercises (mean = 3.42, SD = 9.48, likely a typo), implying their usefulness in active learning. Learning targets received a mean of 3.41 (SD = 0.45), indicating clear objectives. However, facts about the lesson had the lowest mean of 3.4 (SD = 0.44), suggesting comparatively less positive sentiment. Overall, students showed strong agreement on assessment, lesson structure, and learning targets, while perceptions varied slightly for learning exercises and facts about the lesson. Correcting the typo in the standard deviation for learning exercises is essential for accuracy.

Assessment of Skills Performance of Students using Project-Based Learning Material.

This shows the criteria for the assessment of the project-based learning module in terms of inquiry, design, creation and evaluation. The following results are obtained with the application of the same process of evaluating the effectiveness of the PBLM components.

Table 2
Summary Table of the Respondent's Perception of the Assessment Measures of Performance Skills of Students

Quality Assessments in terms of …	Mean	SD	Interpretation
Inquiry	3.57	0.40	Highly Manifested
Design	3.57	0.41	Highly Manifested
Creation	3.56	0.40	Highly Manifested
Evaluation	3.63	0.47	Highly Manifested
Overall	3.58	0.42	Highly Manifested

Legend: 3.50-4.00 Highly Manifested, 2.50-3.49- Manifested, 1.50-2.49-Moderately Manifested 1.00-1.49 Not Manifested at All

Table 2. This illustrates the summary of the respondents' perception of the Assessment of Performance Skills of Students.

The highest-rated aspect is "evaluation" with a mean score of 3.63 (SD = 0.47), indicating that students can draw conclusions from tasks, reflect, collaborate effectively, and provide positive feedback. "Inquiry" and "designing" also score well at 3.57 (SD = 0.40 and 0.41), highlighting students' ability to ask questions and engage in designing processes. "Creation" is close behind with a score of 3.56 (SD = 0.40). The general agreement among respondents is evident, with a low overall standard deviation of 0.42, reflecting a consistent perception of skill assessment. This agreement is particularly strong in "inquiry" and "creation," where the standard deviation matches at 0.40. This

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suggests a solid consensus among respondents regarding assessment measures for skills like inquiry, design, creation, and evaluation. The study's outcomes align well with the contemporary recognition of evaluating students' proficiencies that extend beyond conventional subject knowledge, echoing Darling-Hammond et al.'s (2018) research emphasizing the assessment of critical thinking, collaboration, and problem-solving. Thus, the study's findings echo this educational trend by highlighting students' capabilities in drawing inferences, questioning, design participation, and feedback provision. The consistent perception of skill assessment is further substantiated by the notably low overall standard deviation, reflecting a widespread acknowledgment within the education community regarding the pivotal role of evaluating performance skills.

Test of Difference in the Pre-Test and Post-Test Scores of the Students in Entrepreneurship

This study determined the significant difference in the entrepreneurial skills performance of the respondents after utilizing the project-based learning material. The following results were obtained.

Table 16 demonstrates the test of the difference between the pre-test and post-test performance of the respondents in entrepreneurial skills on critical thinking, collaborative and computational skills.

Based on the given table, there is a significant difference between the pre-test and post-test performances on entrepreneurial skills assessment of the student-respondents on critical thinking, collaboration and computational. This implies that students were able to improve their entrepreneurial skills and that using the Project-Based Learning Material effectively improves the skills of critical thinking, collaboration and computational.

Table 3

Test of Difference in the Pre-Test and Post-Test Scores of the Students in Entrepreneurship

Entrepreneurial Skills		Mean	SD	Mean	t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
								Lower	Upper
Critical Thinking	Pre	11.12	4.03	3.8	-8.615	89	.000	-4.676	-2.924
	Post	14.92	3.61						
Computational Skill	Pre	11.89	3.34	2.47	-5.351	89	.000	-3.383	-1.551
	Post	14.36	3.41						
Collaborative Skill	Pre	7.36	3.05	5.6	-13.274	89	.000	-6.438	-4.762
	Post	12.96	4.70						

**. The difference is significant at the 0.05 level (2-tailed).*

The data in Table 3 demonstrate a notable increase in critical thinking skills, with a mean difference of 3.8 between pre-test and post-test scores, signaling a positive outcome. The computed t-value of -8.615 ($p < 0.05$) confirms a significant improvement attributed to Project-Based Learning Material (PBLM). Table 16 illustrates this improvement, revealing fewer students in the "poor" level after PBLM use. A decrease from 16.7% to 4.4% occurred in the "fair" level, while the "good" level reduced from 44.4% to 16.7%. Importantly, the "excellent" level saw a substantial increase from 15.5% to 43.3%, indicating enhanced analytical skills due to PBLM's influence.

Similarly, computational skills showed improvement, with a mean difference of 2.47 and a t-value of -5.351 ($p < 0.05$). This is highlighted in Table 16, where students excelled in higher skill levels after utilizing PBLM. Notably, students were able to perform tasks such as bookkeeping, financial statement analysis, and business planning.

Collaborative skills also exhibited significant progress, evidenced by a mean difference of 5.6 and a t-value of 13.274 ($p < 0.05$). This indicates that PBLM significantly influenced students' ability to work together effectively. Consequently, it can be concluded that the integration of PBLM improved students' entrepreneurial skills in critical thinking, computational, and collaborative aspects.

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This study validates the content and utility of PBLM, showcasing its positive impact on entrepreneurship learning. Notably, the material led to substantial performance enhancement in post-tests, resulting in a higher level of achievement. Importantly, the use of PBLM fostered collaboration, effective business operations, and record keeping for monitoring progress.

In summary, the results affirm that Project-Based Learning Material is effective in elevating critical thinking, computational, and collaborative skills among students. It offers a valuable tool for enhancing entrepreneurial learning and practical business understanding.

Test of Relationship Between the Perceived Effectiveness of the Component of the Project-Based Learning Material and the Entrepreneurial Skills of Students

Table 4 presents the correlation between the perceived level of effectiveness of the Project-Based Learning Material and the entrepreneurial skills of students.

The succeeding table below shows that there is no significant relationship between the level of effectiveness of the components of the Project-Based Learning Material and the entrepreneurial skills performance of the students. It is shown in the table that the component of the project-based learning material has no significant relationship with entrepreneurial skills.

Table 4
Correlation of the level of Effectiveness of the Components of Project-Based Learning Material with that of their Entrepreneurial Skills.

Indicators	Entrepreneurial Skills		
	Critical Thinking	Computational Skill	Collaborative Skill
learning targets	.018	.083	.179
learning activities	.091	.112	.215*
facts about the lesson	-.045	-.003	.155
learning assessment	-.012	.007	.077
lesson structure	-.095	-.045	.022

*. Correlation is significant at the 0.05 level (2-tailed).

Results indicate that no significant relationship exists between learning targets and entrepreneurial skills, in terms of critical thinking, computational ability, and collaboration. Similarly, learning activities show no significant connection with critical thinking and computational skills, except for collaborative skills. Facts about the lesson also demonstrate no substantial relationship with entrepreneurial skills. Likewise, no significant links are found between learning assessment and entrepreneurial skills across critical thinking, computational ability, and collaboration. Additionally, no notable relationship is observed between the assessment measures of skill performance and entrepreneurial skills. Lastly, no significant relationship is identified between lesson structure and entrepreneurial skills. However, an r-value of 0.215 reveals that 21.5% of learning activities contribute to students' collaborative skill performance. This suggests that increased collaboration during group tasks, like business planning, contributes to the development of collaborative skills.

These findings suggest that, based on learner perception, the learning content in PBLM does not significantly impact their mastery or enhancement of entrepreneurial skills. Other components of PBLM, such as critical thinking and computational skills, are influenced by individual capacities rather than the learning content itself. Nonetheless, previous tables and findings demonstrate PBLM's effectiveness in developing entrepreneurial skills. This underscores that while learning targets, activities, lesson facts, assessment, and structure might not directly impact collaborative skills, even minor improvements in these components lead to notable enhancements in students' entrepreneurial skills.

The PBLM's learning targets provide guidance before each lesson, specifying what students need to know, do, and learn. The assessment process includes diagnostic, formative, and summative assessments, catering to different stages of instruction. These components collectively contribute to PBLM's effectiveness, as respondents

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have affirmed its positive impact on their entrepreneurial skills. This reinforces the notion that the sequence of learning targets, activities, lesson facts, and assessments within the lesson structure is potent in teaching and learning.

Conclusively, employing PBLM as part of the teaching-learning process proves to be a valuable tool in enhancing learners' entrepreneurial skill performance. The PBLM's contents can significantly influence the mastery levels of critical thinking, computational skills, and collaboration. Contrary to expectations, integrating PBLM does not exhibit a significant relationship with students' skills performance in entrepreneurship. The efficacy of learning material lies in its ability to facilitate understanding, aiding the learning process and effective message delivery.

In summary, this analysis clarifies the interplay between PBLM components and students' entrepreneurial skills. It underscores that while some components might not directly correlate with certain skills, their collective enhancement contributes to students' overall skill development.

The effectiveness of the learning material can be seen from the ability of the students to learn and understand the learning material easily. According to Arsyad (2011), using learning materials will greatly assist the enhancement of the learning process and the delivery of the message at the time.

Assessment of Skills Performance of Students using Project-Based Learning Material.

This shows the criteria for the assessment of the project-based learning module in terms of inquiry, design, creation and evaluation. The following results are obtained with the application of the same process of evaluating the effectiveness of the PBLM components.

Table 5
Correlation of the Assessed Measures of Skills Performance of Students Using the Project-Based Learning Material to their Entrepreneurial Skills

Quality Assessment Measures	Entrepreneurial Skills		
	Critical Thinking	Computational Skill	Collaborative Skill
inquiry	.057	.129	.157
design	-.015	-.019	.027
creation	-.065	.023	.082
evaluation	-.052	-.001	.072

*. Correlation is significant at the 0.05 level (2-tailed).

The analysis reveals that despite respondents' strong agreement on all components of the prescribed Project-Based Learning Material, no significant relationship is evident among the correlated variables. This outcome might be attributed to the fact that variables like inquiry, design, creation, and evaluation do not directly influence the effectiveness of assessed skill measures in students using Project-Based Learning Material.

Interestingly, Maksum and Purwanto (2022) highlight that their developed module underwent expert assessment, displaying high content validity, and practicality tests affirmed its usefulness. Their results also demonstrated the module's effectiveness in improving student learning outcomes. Similarly, Indrawati et al. (2020) found student responses to modules to be positive, as indicated by post-use questionnaires. Amri (2013) attributes this to modules being equipped with clear and communicative instructions, facilitating better understanding among students.

In summary, Table 5 shows that despite strong agreement on Project-Based Learning Material components, no significant relationship exists between assessed skill measures and entrepreneurial skills. Nevertheless, insights from other research emphasize the importance of well-designed and effective modules in enhancing student learning outcomes and understanding.

The following are the significant findings of the study based on the data analyzed and interpreted.

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1. Level of Effectiveness of the Project-Based Learning Material Components in Terms of Learning Targets, Learning Activities, Facts About the Lesson, Learning Assessment and Lesson Structure

The study's findings underscore the effectiveness of Project-Based Learning Material (PBLM) in enhancing entrepreneurship and entrepreneurial skills among Grade 12 HUMSS students, as evidenced by the mean scores and standard deviations. The significantly high mean score of 3.56 (SD = 0.42) for learning assessments highlights their crucial role in clarifying performance expectations, fostering positive beliefs, and encouraging self-assessment. Similarly, the positive response to the lesson structure (mean = 3.45, SD = 0.42) emphasizes its contribution to organizational effectiveness and an enriched learning experience. Moreover, the favorable mean score of 3.42 (SD = 0.48, corrected) for learning exercises reaffirms their value in promoting active learning. While learning targets received a mean score of 3.41 (SD = 0.45), denoting clear objectives, the comparatively lower mean score of 3.4 (SD = 0.44) for facts about the lesson suggests the potential for improvement in this area. These findings collectively highlight the benefits of project-based learning in entrepreneurship education, bridging theory and practice effectively. The study contributes insights for educators to optimize curriculum design and delivery, ensuring a robust foundation for entrepreneurship skills among Grade 12 HUMSS students.

2. Respondents' Perception on the Assessed Measures of Skills Performance of Students Using Project-Based Learning Material

The study's analysis of skills performance assessment using Project-Based Learning Material (PBLM) unveils significant insights into the effectiveness of entrepreneurship education for Grade 12 HUMSS students. The outcomes, as indicated by mean scores and standard deviations, emphasize the strength of PBLM in fostering vital skills. Particularly noteworthy is the high mean score of 3.63 (SD = 0.47) for "evaluation," highlighting students' adeptness in drawing conclusions, effective collaboration, and constructive feedback. The commendable scores for "inquiry" (mean = 3.57, SD = 0.40) and "design" (mean = 3.57, SD = 0.41) underscore students' proficiency in questioning and design processes. With a score of 3.56 (SD = 0.40), "creation" also exemplifies their creative competence. The study further underscores the consensus among respondents, reflected in the low standard deviations, particularly matching at 0.40 for "inquiry" and "creation." These findings collectively highlight the notable benefits of project-based learning in nurturing entrepreneurship skills, where students demonstrate a solid grasp of inquiry, design, creation, and evaluation. As such, this research underscores the pedagogical value of PBLM in entrepreneurship education, while also offering avenues for refining its application and strengthening areas of assessment to prepare Grade 12 HUMSS students effectively for entrepreneurial endeavors.

3. Level of Entrepreneurial Skills of Students Before and After Using the Prescribed Project-Based Learning Material Based on the Pre-Test and Post-Test Scores

A. Pre-Test

The initial assessment reveals an average performance in entrepreneurial skills, with a majority of respondents scoring within the range of 9-12 and below. These findings emphasize the baseline proficiency level and highlight the need for skill enhancement. Pre-test statistics point to substantial proportions of students allocating to critical thinking (67.8%), computational skills (96.7%), and varying levels of competency (poor, fair, and good) at 59.9%.

B. Post-Test

Contrarily, post-test outcomes showcase a noteworthy improvement driven by the utilization of the prescribed Project-Based Learning Material. The statistics speak to a 99% enhancement in critical thinking and collaborative skills, accompanied by a substantial 91.11% increase in computational skill. Notably, percentages exemplify significant shifts towards higher levels of proficiency, with critical thinking skills demonstrating a 27.8% surge to the excellent level, computational skills witnessing an elevation of 21.1% to the excellent category, and collaborative skills showcasing a remarkable 71.1% increase in performance. Moreover, the post-test results highlight a remarkable reduction in students categorized as "poor" after implementing the Project-Based Learning Material.

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Collectively, this research elucidates the instrumental benefits of project-based learning in entrepreneurship education. It not only underscores the material's potential to bridge theoretical understanding with practical competencies but also highlights its efficacy in preparing students for the multifaceted challenges of entrepreneurship. However, while the study validates the positive impact of the material, careful consideration of potential limitations remains essential to optimize its application across diverse educational contexts.

4. Test of Difference in the Pre-Test and Post-Test Scores of the Students Respondents in Entrepreneurial Skills Assessment

The study reveals compelling evidence of its impact, as evidenced by statistically significant differences between pre-test and post-test performance. With mean differences of 3.8 in critical thinking, 2.47 in computational skills, and 5.6 in collaborative abilities, the study underscores the material's effectiveness in driving marked improvements across these essential entrepreneurial competencies. These findings underscore project-based learning's ability to effectively nurture practical skills while preparing students to navigate the complexities of entrepreneurship. As the study showcases the material's positive influence, it also emphasizes the importance of ongoing refinement to optimize its application within diverse educational settings and contexts.

5. Test of Relationship between the Perceived Level of Effectiveness of the Project-Based Learning Material Components with that of the Entrepreneurial Skills Performance

The study provides insightful findings regarding the complex interplay between project-based learning components and skill advancement. While the results indicate that the perceived effectiveness of most Project-Based Learning Material components does not display a significant relationship with critical thinking (r=.018), computational (r=.083), and collaborative skills (r=.179), an exception emerges in the form of learning activities, which shows a noteworthy correlation with collaborative skills (r=.215). This underscores the multifaceted nature of skill development through project-based learning. The research contributes to a nuanced understanding of how these components influence entrepreneurial competencies, shedding light on both the potential benefits and limitations within the context of entrepreneurship education for Grade 12 HUMSS students. As educators endeavor to optimize project-based learning, the study prompts a more comprehensive exploration of the diverse factors that contribute to skill enhancement within this pedagogical framework.

6. Test of Relationship between the Assessed Measures of Skills Performance of Students with that of their Entrepreneurial Skills.

The study yields significant insights into the complex relationships between assessed skills performance measures and entrepreneurial competencies. The findings reveal that, despite the comprehensive evaluation of skills encompassing inquiry, design, creation, and evaluation, no significant relationship emerges with critical thinking, computational, and collaborative skills. These outcomes underscore the complex nature of skill development within the project-based learning framework. While the assessed measures did not exhibit direct correlations with specific entrepreneurial skills, the research underscores the multifaceted nature of entrepreneurial skill acquisition and the need for a holistic approach in shaping proficient entrepreneurs. As educators strive to optimize project-based learning, this study emphasizes the importance of a nuanced understanding of how various skill components intertwine to foster entrepreneurial excellence among Grade 12 HUMSS students.

Conclusion

Based on the findings of the study, the following conclusions were drawn;

1. There is a significant difference in the pre-test and post-test scores of the students in entrepreneurship skills assessment in terms of critical thinking, computational and collaborative skills after utilizing the Project-Based Learning Material. Therefore, the hypothesis that no significant difference exists between the assessed variables before and after using the Project-Based Learning Material is not sustained.

   These results are in harmony with recent research that demonstrates the superiority of project-based learning over traditional teaching methods in terms of elevating learning outcomes, fostering positive affective

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attitudes, and honing essential thinking skills among students (Zhang & Ma, 2023). The current study contributes to this growing body of evidence, accentuating the pedagogical value of project-based learning, particularly its role in amplifying academic achievement in the context of entrepreneurship education.

2. There is no significant relationship between the level of assessed effectiveness of the components of the Project-Based Learning Material on learning targets, learning activities, facts about the lesson, and learning assessment. Therefore, the hypothesis that there is no significant relationship between the level of effectiveness of Project-Based Learning Material and the entrepreneurial skills performance of the students is sustained.

   This conclusion aligns with the research conducted by Almulla (2020), where a significant connection was established between the employment of the Project-Based Learning (PBL) method and several key aspects of learning, including collaborative learning, disciplinary subject comprehension, iterative learning, and authentic learning, all of which culminate in heightened student engagement. Almulla's insights emphasize how the PBL method promotes engagement by facilitating knowledge sharing, discussion, and information exchange. Drawing from this parallel, both studies accentuate the complexity inherent in educational methodologies, suggesting that while project-based learning, as in the PBL approach, holds potential to enhance certain facets of learning, its direct impact on specific skill domains might be influenced by multifaceted dynamics. In light of these congruent findings, it becomes evident that educational strategies like project-based learning must be strategically employed, accounting for diverse learning dimensions and pedagogical considerations.

3. There is no significant relationship between the assessed effectiveness of quality assessment of skills performance of students in terms of inquiry, design, creation, and evaluation and the entrepreneurial skills performance of students. Therefore, the hypothesis that there is no significant relationship between the assessed variables of quality assessment measures of PBLM and the entrepreneurial skills performance of the students is sustained.

   Recent research by Swiecki et al., (2022) delves into the intricate interplay between assessment practices and skill development. They emphasize that while effective assessment strategies are pivotal for evaluating learning outcomes, the direct translation of assessment quality to skill enhancement can be influenced by factors such as instructional alignment, student engagement, and individual learning preferences. This perspective aligns with the current study's outcome and emphasizes the complexity involved in directly attributing assessment measures to skill performance. Thus, the study's findings, along with the insights from Swiecki et al., (2022), collectively underscore the multifaceted nature of skill acquisition and the nuanced relationship between quality assessment and the enhancement of entrepreneurial skills.

Recommendations

Based on the findings and conclusions drawn, the following recommendations are suggested to the:

1. School Heads, Subject Group Heads, and Department Heads. They may encourage subordinates to use project-based learning material in all learning areas to have a fixed learning method in the classroom, which will assist them in monitoring teachers' accomplishments and students' accomplishments performance. A study by VandeWalle et al. (2019) emphasizes that adopting a unified pedagogical strategy like project-based learning enhances not only student engagement and achievement but also streamlines assessment and instructional alignment. This approach allows educational leaders to better monitor both teacher effectiveness and student performance. By promoting the widespread use of project-based learning material, educational institutions can create a cohesive learning environment that supports holistic skill development and aligns with contemporary educational best practices.

2. Teachers. The recommendation for teachers involves two main aspects: firstly, suggesting the utilization of project-based learning (PBL) materials in entrepreneurship and other subjects, ensuring consistent implementation of lessons and optimizing instructional time; secondly, encouraging teachers to create personalized PBL materials within their specialization to enhance learning through personalization, authenticity, real-world applicability, and innovation. This approach is advocated to yield more relevant, engaging, and enjoyable learning experiences, thereby achieving broader learning outcomes beyond predefined targets, exercises, and assessments. This approach reflects an active demonstration of a modular strategy within PBL. As highlighted by Sahaat and Mohamad Nasri (2020), learning materials, especially in topics like design and

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technology, play a pivotal role in expediting student mentoring. The adoption of learning materials has demonstrated its efficacy in supporting both teachers and students in PBL activities, particularly in reconciling creative problem-solving with the constraints of time.

3. Students. They may be inspired from project-based learning (PBL) materials to cultivate their ability to analyze, evaluate, compute, solve problems, and interpret various learning concepts. Through individual or collaborative learning experiences, they can actively engage with PBL materials, fostering a deeper understanding and practical application of the subjects at hand.

   This approach effectively demonstrates the applicability of a modular approach within the framework of PBL. Sahaat and Mohamad Nasri's (2020) findings underscore the importance of teaching modules, particularly in subjects like Design and Technology, as a means for educators to provide more targeted guidance to students within a limited time frame. This becomes crucial when addressing the challenge of integrating inventive problem-solving techniques into PBL while adhering to time constraints. Hence, the integration of modular strategies emerges as a constructive method to tackle these challenges, ultimately enhancing the quality of both teaching and learning experiences within project-based activities.

4. Future researchers. They may conduct a parallel study in entrepreneurship and other disciplines incorporating other variables that are not utilized in this study.

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