INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 09 Issue 11 November 2026

DOI: 10.47191/ijmra/v9-i11-29, Impact Factor: 8.685

Page No. 7763-7776

Integrating Entrepreneurship in Technology and Livelihood Education: Assessing Its Impact on Students' Business Literacy and Career Preparedness

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ABSTRACT: This study examined the integration of entrepreneurship in Technology and Livelihood Education (TLE) and its relationship with students' business literacy, entrepreneurial skills, and career preparedness. It specifically looked at students' understanding of basic business concepts, their entrepreneurial skills, and their perceived readiness for future employment and business opportunities. The study used a quantitative descriptive-correlational research design and was conducted among Grade 10 students from four selected public junior high schools in the Torrijos District of Marinduque. Using purposive sampling, 200 Grade 10 students who met the inclusion criteria were invited to participate, and 188 provided valid responses that were included in the final analysis. Data were gathered through a researcher-made questionnaire and analyzed using frequency, percentage, mean, standard deviation, ranking, and Pearson Product-Moment Correlation. The findings showed that students had a high level of business literacy (M = 3.23, SD = 0.49). Budgeting was the area in which students showed the highest understanding, while identifying business opportunities within their community received the lowest mean, although it was still interpreted as high. Students also demonstrated a high level of understanding of financial management, marketing, and operations (M = 3.19), with financial management obtaining the highest mean. Their entrepreneurial skills were likewise rated high (M = 3.24), with problem-solving receiving the highest mean, followed by innovation and decision-making. In terms of career preparedness, students also reported a high level (M = 3.26), with entrepreneurial confidence obtaining the highest mean and readiness for employment the lowest. The correlation results revealed significant positive relationships between entrepreneurship integration and business literacy ($r = .82$, $p < .001$) and between entrepreneurship integration and career preparedness ($r = .72$, $p < .001$). Significant positive relationships were also found between students' participation in entrepreneurship-related activities and business literacy ($r = .62$, $p < .001$) and career preparedness ($r = .81$, $p < .001$). These findings indicate that higher reported levels of entrepreneurship integration and participation were associated with higher levels of business literacy and career preparedness among the respondents. However, because the study used a descriptive-correlational design, the findings indicate association rather than direct causation. Based on the findings, the researcher proposed the TLE Entrepreneurship Enhancement Program (TEEP), "From Skills to Enterprise," which focuses on business opportunity recognition, financial management, marketing, innovation, problem-solving, and career and enterprise readiness. The program aims to provide students with more practical and meaningful opportunities to apply entrepreneurship concepts within and beyond the classroom. Overall, the study highlights the value of strengthening entrepreneurship-related learning experiences in TLE to support students' business knowledge, entrepreneurial competencies, and preparation for future employment, livelihood, and business opportunities.

KEYWORDS: Career Preparedness, Enterprise Readiness, Entrepreneurial Skills, Financial Management, Perceived Readiness

I. INTRODUCTION

Education is constantly evolving to enable learners to be prepared and equipped for the ever-changing global and economic landscape. Due to how globalization, digital innovation, and automation re-define traditional job roles and school practices, a growing emphasis is placed towards equipping students with real-world skills that foster independence, adaptability, strength, and resilience. This skills are crucial as students are expected to shape existing competencies needed for them to thrive in uncertain environments.

This global change has affected educational priorities in the Philippine education system wherein the integration of entrepreneurship into the Technology and Livelihood Education (TLE) curriculum reflects a national strategy to strengthen inclusive development and independence among learners. TLE provides opportunities for learners to be able to delve into

important learning points such as business planning and product development. Through the incorporation of entrepreneurial principles, the curriculum seeks to empower students to manage resources wisely, generate income, and create value for their communities (Department of Education, 2023). Effective implementation would strengthen the capacity of students to participate in the economy either through employment or self-employment (Department of Education, 2023; Barcelona et al., 2023).

At the local level, these objectives become more relevant in rural areas such as Torrijos District, Marinduque. As a rural locale where small-scale trading and agriculture serve as the main sources of livelihood, the district presents both opportunities and challenges for its students. A significant number of young people in Torrijos have limited access to formal job markets and are more likely to engage in entrepreneurial activities or informal economic activities after their educational completion. In relation to this context, the Technology and Livelihood Education subject can serve as means to strengthen learner preparedness for their future careers and business ventures through practical business competencies.

Despite current national policies that support entrepreneurship education, there remains a need for Philippine studies that examine the relationship between entrepreneurship education and student outcomes in rural settings.

The present study seeks to examine how integration of entrepreneurship in the TLE subject affects the business literacy and career preparedness of students with the goal of providing a proposed intervention program which addresses the needs of rural learners.

Research Question

This study aimed to assess the integration of entrepreneurship in the Technology and Livelihood Education (TLE) subject and its relationship with students' business literacy and career preparedness. Specifically, it examined the reported levels of business literacy, business concepts, entrepreneurial skills, and career preparedness and the relationships among the specified variables.

1. What is the level of students' business literacy in relation to the integration of entrepreneurship in TLE education?
2. What is the level of students' understanding of business concepts in terms of:
    2.1 financial management
    2.2 marketing
    2.3 operations
3. What is the level of students' entrepreneurial skills in terms of:
    3.1 problem-solving skills
    3.2 decision-making skills
    3.3 innovation skills
4. What is the extent of students' preparedness for future career opportunities or business ventures after exposure to entrepreneurship in TLE?
5. Is there a significant relationship between entrepreneurship integration in TLE and students' business literacy?
6. Is there a significant relationship between students' participation in entrepreneurship-related activities and their business literacy levels?
7. Is there a significant relationship between students' participation in entrepreneurship-related activities and their preparedness for future career opportunities or business ventures?
8. What intervention program may be proposed based on the findings of the study?

II. SCOPE AND LIMITATION OF THE STUDY

This study examined the integration of entrepreneurship in the Technology and Livelihood Education subject and its relationship with the business literacy and career preparedness of Grade 10 students in selected public junior high schools within the Torrijos District, Marinduque. It included the learners' demographic profile, reported entrepreneurial competencies, and the associations of these factors with business literacy and career preparedness.

The scope of the study included an analysis of students' perceptions of their TLE learning experiences related to entrepreneurship and their reported understanding of fundamental business concepts and readiness for future vocational or entrepreneurial pursuits. Data were collected through a researcher-made questionnaire and analyzed using descriptive and correlational statistical methods.

This study covers selected public junior high schools within the Torrijos District during the 2026 to 2027 academic year. The respondents only include Grade 10 students currently enrolled in the Technology and Livelihood Education (TLE) subject. The

research only includes the variables outlined in the research paradigm, namely students' entrepreneurial knowledge and skills, business literacy, and career preparedness.

The study does not include other factors that may also influence the outcomes, such as the quality of TLE instruction, teacher competence, the accessibility of instructional resources, and broader economic conditions outside the school setting. In addition, the research relies on self-reported responses, which may be influenced by individual perceptions or biases. Among the limitations of the study is its non-generalizability to other learning environments and educational institutions.

FRAMEWORK

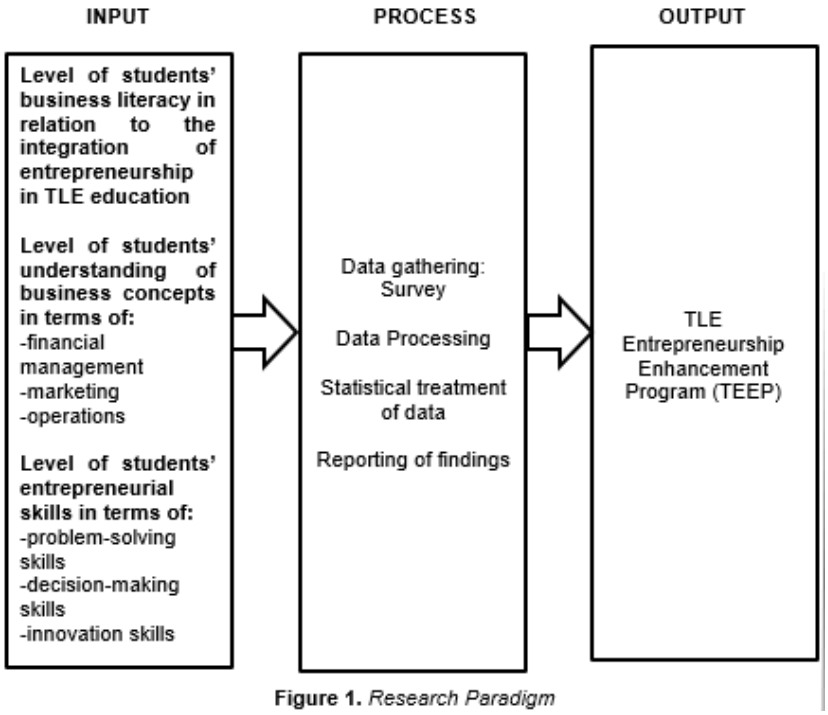


Figure 1. *Research Paradigm*

Figure 1 presents the conceptual framework of the study using the Input-Process-Output (IPO) model. The input consists of the level of students' business literacy in relation to the integration of entrepreneurship in Technology and Livelihood Education (TLE), their understanding of business concepts in terms of financial management, marketing, and operations, and their entrepreneurial skills in terms of problem-solving, decision-making, and innovation. These variables serve as the primary basis for examining students' knowledge and competencies related to entrepreneurship education.

The process involves data gathering through a survey, data processing, statistical treatment of the collected data, and reporting of findings. Through these procedures, the researchers systematically organize, analyze, and interpret the information obtained from the respondents to determine the students' levels of business literacy, understanding of business concepts, and entrepreneurial skills.

The output of the study is the proposed TLE Entrepreneurship Enhancement Program (TEEP). This program is intended to strengthen entrepreneurship integration in TLE education by addressing the identified needs and areas for improvement among students. Overall, the framework illustrates how the assessment of students' business literacy, understanding of business concepts, and entrepreneurial skills, when systematically processed and analyzed, can serve as a foundation for developing an enhancement program to support students' entrepreneurial learning and competencies.

Research Design

The present study employed a quantitative approach specifically, a descriptive-correlation research design. The descriptive aspect was utilized in the determination of the level of student business literacy, career readiness, and entrepreneurial skills in relation to the integration of TLE. For the determination of any existing relationship between business literacy and entrepreneurship-related activities and career readiness, the correlational research design was employed. Descriptive quantitative research is suitable for the present study as it enables the gathering of numerical data using survey questionnaires as instrument to describe characteristics and patterns among variables.

Research Instruments

For the data gathering of the study, a researcher-made structured survey questionnaire was employed in the study to assess the relationship of entrepreneurship education and address the variables indicated in the statement of the problem of the study. The instrument referred to existing literature, validated frameworks on entrepreneurship education, career preparedness, and business literacy. This questionnaire is divided into four parts. Part 1 evaluates the proficiency of students in business literacy in relation to integrating entrepreneurship in TLE while assessing the understanding of learners regarding basic business concepts. Part I presents items which assess the perceived level of entrepreneurship integration in the TLE subject. This includes indicators related to instructional content, teacher facilitation, exposure to entrepreneurial values, and classroom-based enterprise activities.

Part II emphasizes the specific business principles that learners are able to grasp more effectively after integration. This includes financial management, marketing, and operations, underscoring how entrepreneurship education enriches their comprehension in these domains. This segment comprises the components which assess the comprehension and awareness of learners on business-oriented principles like marketing, budgeting, pricing, innovation, and ethical standards. It facilitates the evaluation of business literacy proficiency among tenth-grade learners.

Part III examines the improvement of skills derived from entrepreneurial endeavors, specifically in areas such as problem-solving, decision-making, and creativity which describe students' reported the critical and creative thinking capabilities of learners. Lastly, Part 4 evaluates the degree to which students are prepared for future employment or entrepreneurial endeavors, analyzing how their exposure to entrepreneurship has qualified them for practical business issues and career trajectories. Various parts of the survey seeks to elucidate a specific facet of the learning experience and results stemming from the incorporation of entrepreneurship in TLE.

Data Gathering Procedures

Prior to data collection, permission was first secured by the researcher from the Schools Division Office of Marinduque, District Supervisor of Torrijos District and the participating school heads. After which, the researcher coordinated with the TLE teachers in conducting the data gathering regarding logistics and schedule. Apart from this, the approved parental consent forms were secured prior to allowing student participation, considering that respondents were mostly minors.

During an appropriate period in the school schedule, the final questionnaires were distributed by the researcher to the selected Grade 10 respondents wherein the study purpose, nature of participation, process, and instructions were expounded on by the researcher. Sufficient time was then provided to the respondents to answer the questionnaire while teachers aided in the distribution and collection of the answer questionnaires. The checking, coding, organizing, and encoding of responses were then conducted by the researcher for statistical analysis. The original responses were preserved during encoding and were not altered to improve completeness or statistical results.

Missing-data treatment. The researcher screened completed questionnaires for unanswered items. The 188 usable questionnaires were retained for the principal analyses. When an item or section was unanswered, no value was assigned or imputed; the case was excluded only from the affected scale or analysis requiring that response. This item- or scale-specific handling explains why some reliability calculations have smaller valid *N* values than the *N* = 188 used in the main correlation analyses.

III. RESULTS

This chapter presents, analyzes, and interprets the data gathered from Grade 10 learners on the integration of entrepreneurship in Technology and Livelihood Education (TLE) and its relevance to business literacy, entrepreneurial skills, and career preparedness. Of the 200 students invited, 188 returned usable questionnaires. Because some respondents left particular items unanswered, the valid *N* differs slightly across scales and analyses; the valid *N* used is stated in the note beneath each table, and no missing values were imputed (see Chapter 3).

Table 1
Level of Students' Business Literacy in Relation to the Integration of Entrepreneurship in TLE Education

Item	M	SD	Verbal interpretation
1. I understand what a business is and its purpose.	3.29	0.69	Very High
2. I can identify different types of businesses (e.g., sole proprietorship, partnership, corporation).	3.00	0.66	High
3. I know the basic functions of a business (marketing, finance, operations).	3.06	0.70	High
4. I understand the concepts of profit and loss.	3.28	0.74	Very High
5. I understand the importance of budgeting in business.	3.48	0.66	Very High
6. I can compute simple business income and expenses.	3.17	0.74	High
7. I can identify business opportunities within the community.	2.99	0.74	High
8. I understand the importance of planning before starting a business.	3.44	0.70	Very High
9. I can apply simple business practices in daily life situations.	3.21	0.70	High
10. TLE entrepreneurship lessons helped me understand business concepts better.	3.43	0.74	Very High
Overall	**3.23**	**0.49**	**High**

Note. 3.26–4.00 – Very High; 2.51–3.25 – High; 1.76–2.50 – Low; 1.00–1.75 – Very Low. Valid *N* = 186 of 188 usable questionnaires (200 students invited).

The results presented in Table 1 indicate that students have a high level of business literacy in relation to the integration of entrepreneurship in Technology and Livelihood Education (TLE), as reflected by the overall mean of 3.23 and standard deviation of 0.49. This suggests that students generally possess an adequate understanding of fundamental business concepts and recognize the importance of entrepreneurship in their TLE education. Among the indicators, understanding the importance of budgeting in business obtained the highest mean of 3.48 (SD = 0.66), verbally interpreted as Very High. This was followed by understanding the importance of planning before starting a business, with a mean of 3.44 (SD = 0.70), and the contribution of TLE entrepreneurship lessons to understanding business concepts, with a mean of 3.43 (SD = 0.74), both interpreted as Very High. These findings suggest that students are particularly knowledgeable about financial preparation, business planning, and the role of entrepreneurship lessons in developing their business understanding. In contrast, identifying business opportunities within the community obtained the lowest mean of 2.99 (SD = 0.74), followed by identifying different types of businesses, with a mean of 3.00 (SD = 0.66), although both remained within the High category. This indicates that students may benefit from additional learning experiences that strengthen their ability to recognize potential business opportunities and distinguish among different business structures. Meanwhile, the relatively low overall standard deviation indicates that responses were generally clustered around the mean, suggesting a degree of consistency in students' perceived business literacy.

The findings are consistent with the emphasis of UNESCO (2023) on integrating entrepreneurship into formal education to develop learners' creativity, independent thinking, collaboration, and capacity to respond to economic opportunities.

Similarly, the OECD (2023) emphasizes that financial literacy involves understanding financial concepts and applying financial knowledge to make sound decisions, including budgeting and financial planning.

These perspectives support the importance of integrating business and financial concepts into TLE entrepreneurship lessons. The implication of the findings is that TLE teachers should sustain effective entrepreneurship instruction while providing more practical and community-based learning activities. Students may be engaged in business simulations, simple business plan development, product pricing, budgeting exercises, and community market surveys to help them identify potential customers, assess local needs, and recognize feasible business opportunities.

Collaborations with local entrepreneurs and small business owners may also provide authentic exposure to business operations and different business structures. Through these activities, entrepreneurship integration in TLE can move beyond conceptual understanding toward the practical application of business knowledge, helping students strengthen their entrepreneurial competencies and prepare for future livelihood opportunities.

Table 2
Business Concepts Better Understood by Students as a Result of Entrepreneurship Integration in TLE

Business concept	Items	α	M	SD	Rank	Verbal Interpretation
Financial management	8	.86	3.22	0.52	1	High
Marketing	7	.85	3.19	0.51	2	High
Operations	8	.87	3.14	0.51	3	High
Overall	**23**	**.94**	**3.19**	**0.46**		**High**

Note. 3.26–4.00 – Very High; 2.51–3.25 – High; 1.76–2.50 – Low; 1.00–1.75 – Very Low. Valid *N*: financial management = 186, marketing = 177, operations = 185, out of 188 usable questionnaires (200 students invited). The overall α is based on the 174 respondents who answered all 23 items.

The results presented in Table 2 reveal that students have a high level of understanding of business concepts as a result of entrepreneurship integration in TLE, as indicated by the overall mean of 3.19 and standard deviation of 0.46. This suggests that integrating entrepreneurship into TLE education helps students develop their understanding of essential business functions, particularly financial management, marketing, and operations. Among the three business concepts, financial management ranked first, obtaining a mean of 3.22 (SD = 0.52) and a Cronbach's alpha of 0.86, verbally interpreted as High. This indicates that students demonstrate a relatively stronger understanding of financial management concepts, such as budgeting, managing expenses, and understanding business income. Marketing ranked second, with a mean of 3.19 (SD = 0.51) and a Cronbach's alpha of 0.85, also interpreted as High. This suggests that students understand basic marketing concepts, including promoting products and identifying potential customers. Meanwhile, operations ranked third, with a mean of 3.14 (SD = 0.51) and a Cronbach's alpha of 0.87, likewise interpreted as High. Although it obtained the lowest mean among the three areas, the result still indicates that students have a favorable understanding of the basic processes involved in producing goods and delivering services. The overall Cronbach's alpha of 0.94 suggests excellent internal consistency among the items measuring students' understanding of these business concepts. However, the results indicate perceived understanding based on the responses collected and should not be interpreted as direct evidence of students' actual performance unless supported by an objective assessment.

The findings are supported by UNESCO-UNEVOC (2023), which emphasizes that entrepreneurial learning in technical and vocational education helps students develop transferable competencies and prepare for changing workplace demands. The organization also highlights the importance of practical learning experiences that enable students to apply entrepreneurial knowledge to real-world situations.

Similarly, the OECD (2023) identifies work-based learning as an important feature of quality vocational education because it allows learners to apply classroom knowledge in practical settings and facilitates their transition to employment.

These perspectives support the integration of financial management, marketing, and operations into TLE entrepreneurship lessons. The implication is that teachers should strengthen these business concepts through hands-on and experiential learning activities. For financial management, students may prepare budgets, calculate costs, and determine profit or loss. For marketing, they may develop promotional materials, identify target customers, and conduct simple market surveys. For operations, they may engage in product development, production planning, inventory management, and quality control. These activities can help students connect theoretical concepts with actual business practices, improve their decision-making abilities, and develop the practical competencies necessary for future employment or entrepreneurial ventures.

Table 3

Influence of Participation in Entrepreneurship-Related Activities within TLE on Students' Entrepreneurial Skills

Entrepreneurial skill	Items	α	M	SD	Rank	Verbal interpretation
Problem-solving skills	8	.86	3.27	0.50	1	Very High
Innovation skills	8	.85	3.24	0.47	2	High
Decision-making skills	8	.84	3.21	0.47	3	High
Overall	**24**	**.94**	**3.24**	**0.44**		**High**

Note. 3.26–4.00 – Very High; 2.51–3.25 – High; 1.76–2.50 – Low; 1.00–1.75 – Very Low. Valid *N*: problem-solving = 186, decision-making = 187, innovation = 185, out of 188 usable questionnaires (200 students invited). The overall α is based on the 182 respondents who answered all 24 items.

The results presented in Table 3 reveal that students demonstrate a high level of entrepreneurial skills through their participation in entrepreneurship-related activities within TLE, as indicated by the overall mean of 3.24 and standard deviation of 0.44. This suggests that students perceive themselves as capable of applying entrepreneurial competencies, particularly in problem-solving, innovation, and decision-making. Among the three indicators, problem-solving skills ranked first, obtaining a mean of 3.27 (SD = 0.50) and a Cronbach's alpha of 0.86, verbally interpreted as Very High. This indicates that students perceive themselves as capable of identifying challenges and considering possible solutions when engaging in entrepreneurship-related learning activities. Innovation skills ranked second, with a mean of 3.24 (SD = 0.47) and a Cronbach's alpha of 0.85, interpreted as High. This suggests that students recognize their ability to develop ideas, improve products, and explore creative approaches to business-related tasks. Meanwhile, decision-making skills ranked third, with a mean of 3.21 (SD = 0.47) and a Cronbach's alpha of 0.84, also interpreted as High. Although this indicator obtained the lowest mean, the result still reflects a favorable perception of students' ability to evaluate alternatives and make decisions in entrepreneurial situations. The overall Cronbach's alpha of 0.94 indicates excellent internal consistency among the items used to measure entrepreneurial skills. However, since the results are based on the reported ratings, they reflect students' perceived competencies rather than independently verified performance. Furthermore, the descriptive findings alone do not establish that participation in entrepreneurship-related activities directly caused the development of these skills. The findings are supported by the OECD (2023), which explains that entrepreneurial

competencies include creativity, problem-solving, resource management, and the ability to adapt to change. It further emphasizes that these competencies can be developed through entrepreneurship education and training, particularly through problem-based teaching and assessment.

The implication of these findings is that TLE teachers should continue providing entrepreneurship-related activities that encourage students to solve problems, develop innovative ideas, and make informed decisions. For example, students may be tasked with creating products from available materials, improving existing products, identifying solutions to simulated business challenges, and comparing alternative business strategies before selecting the most appropriate course of action. Group-based entrepreneurial projects and product-development activities may also provide opportunities for students to collaborate, evaluate risks, and justify their decisions. Although problem-solving received the highest rating, teachers should also provide additional opportunities to strengthen innovation and decision-making through practical tasks and performance-based assessments. These approaches can help students apply their classroom learning to realistic entrepreneurial situations and further develop the competencies needed for future livelihood opportunities and business ventures.

The findings of the present study are supported by recent literature emphasizing the importance of entrepreneurship education in developing students' entrepreneurial competencies. Motta and Galina (2023) explained that experiential learning contributes to entrepreneurial skill development by allowing students to learn through practical activities and direct experience. Likewise, Otache et al. (2024) found that entrepreneurship education can improve students' entrepreneurial self-efficacy, alertness, and opportunity recognition. Constantine et al. (2024) further reported that entrepreneurial self-efficacy is associated with problem-solving skills, which positively influence the quality of business decision-making. In addition, Bardales-Cárdenas et al. (2024) highlighted the importance of strengthening students' innovation, learning, and adaptation capacities to support entrepreneurial development. These studies provide support for the present findings, in which students demonstrated a high level of entrepreneurial skills, particularly in problem-solving, innovation, and decision-making. The literature also suggests that entrepreneurship integration in TLE should provide meaningful opportunities for students to develop ideas, address practical challenges, evaluate alternatives, and apply their learning through entrepreneurial projects. Nevertheless, because the present study uses descriptive ratings, these findings support the relevance of entrepreneurship education but do not independently establish that participation in TLE activities caused the reported skill levels.

Table 4

Extent of Students' Preparedness for Future Career Opportunities or Business Ventures after Exposure to Entrepreneurship in TLE

Entrepreneurial skill	Items	M	SD	Rank	Verbal interpretation
Entrepreneurial confidence	3	3.34	0.51	1	Very High
Confidence to start a business	3	3.23	0.52	2	High
Readiness for employment	3	3.20	0.54	3	High
Overall career preparedness	**12**	**3.26**	**0.48**		**High**

Note. 3.26–4.00 – Very High; 2.51–3.25 – High; 1.76–2.50 – Low; 1.00–1.75 – Very Low. Valid *N* = 184 of 188 usable questionnaires (200 students invited).

The results presented in Table 4 reveal that students demonstrate a high level of preparedness for future career opportunities and business ventures after exposure to entrepreneurship in TLE, as indicated by the overall mean of 3.26 and standard deviation of 0.48. This suggests that students generally perceive themselves as prepared to apply their entrepreneurial knowledge and skills to future employment or business opportunities. Among the indicators, entrepreneurial confidence ranked first, obtaining a mean of 3.34 (SD = 0.51), verbally interpreted as Very High. This indicates that students demonstrate a strong sense of confidence in their ability to understand and engage in entrepreneurial activities. Confidence to start a business ranked second, with a mean of 3.23 (SD = 0.52), interpreted as High. This suggests that students have a favorable level of readiness to consider establishing their own businesses, although they may still need additional practical experience and guidance to translate their confidence into concrete business plans. Meanwhile, readiness for employment ranked third, with a mean of 3.20 (SD = 0.54), also interpreted as High. Although it obtained the lowest mean among the three indicators, the result indicates that students generally perceive themselves as prepared to enter the workforce. The relatively low standard deviations across all indicators suggest that the responses were fairly consistent. Overall, the findings indicate that entrepreneurship integration in TLE is associated with favorable perceptions of students' career preparedness, particularly in terms of entrepreneurial confidence. However, because the results are based on students' ratings, they reflect perceived preparedness rather than verified employment readiness or actual business-starting capability.

Recent literature further supports these findings. Adeniyi (2023), in a study involving students from technical and vocational education and training institutions, found that entrepreneurial self-efficacy partially mediated the relationship between entrepreneurship education and start-up readiness. The study emphasized the importance of practical entrepreneurship training in helping students translate their knowledge and skills into readiness to establish a business.

Similarly, Otache et al. (2024) found that entrepreneurship education significantly improved students' entrepreneurial self-efficacy, opportunity recognition, and entrepreneurial intentions. These findings support the high rating for entrepreneurial confidence in the present study and suggest that confidence and opportunity recognition are important components of entrepreneurial preparedness.

In addition, Branca et al. (2025), in a systematic literature review, highlighted the value of experiential and active learning approaches in developing entrepreneurial self-efficacy, creativity, and innovativeness. This supports the use of practical TLE activities that allow students to plan business ventures, solve realistic problems, and apply entrepreneurial competencies.

The implication of these findings is that TLE teachers should sustain entrepreneurship education while providing more opportunities for students to prepare for both employment and self-employment. Activities such as developing a simple business plan, preparing a start-up budget, conducting market research, participating in product-selling activities, and presenting business proposals can help students strengthen their confidence and practical capabilities. Teachers may also collaborate with local entrepreneurs and businesses to expose students to actual workplace expectations, business challenges, and career opportunities. Since readiness for employment received the lowest mean among the indicators, additional activities focused on workplace communication, teamwork, problem-solving, and professional responsibility may be beneficial. Through these strategies, entrepreneurship integration in TLE can help students develop greater confidence, make informed career decisions, and become better prepared for future employment or entrepreneurial ventures.

Table 5

Relationship Between Entrepreneurship Integration and Business Literacy/Career Preparedness

Variables	*N*	*r*	r^2	*p*	Decision	Remarks
Entrepreneurship integration and business literacy	188	.82	.68	< .001	Reject H_0	Significant
Entrepreneurship integration and career preparedness	187	.72	.52	< .001	Reject H_0	Significant

Note. *N* = number of respondents with valid responses on both variables, out of 188 usable questionnaires (200 students invited). *r* = Pearson product-moment correlation coefficient; r^2 = coefficient of determination; *p* = significance level (α = .05).

The results presented in Table 5 reveal a strong, positive, and statistically significant relationship between entrepreneurship integration and business literacy, with a correlation coefficient of $r = .82$, a coefficient of determination of $r^2 = .68$, and a *p*-value of less than .001, based on 188 respondents. Since the *p*-value is below the .05 level of significance, the null hypothesis is rejected. This indicates that higher levels of entrepreneurship integration are associated with higher levels of business literacy among students. The coefficient of determination suggests that approximately 68% of the variance in business literacy is statistically shared with entrepreneurship integration in the bivariate relationship. This finding highlights the importance of integrating entrepreneurial concepts and activities into TLE education to help students understand fundamental business principles, including financial management, marketing, budgeting, and business operations.

Similarly, the results show a strong, positive, and statistically significant relationship between entrepreneurship integration and career preparedness, with a correlation coefficient of $r = .72$, a coefficient of determination of $r^2 = .52$, and a *p*-value of less than .001, based on 187 respondents. The null hypothesis is likewise rejected because the *p*-value is below the .05 significance level. This suggests that students who report greater exposure to entrepreneurship integration also tend to report higher preparedness for future career opportunities and business ventures. The coefficient of determination indicates that approximately 52% of the variance in career preparedness is statistically shared with entrepreneurship integration. These findings suggest that entrepreneurship-related learning experiences may be relevant to students' development of entrepreneurial confidence, business readiness, and preparation for employment. However, correlation does not establish causation, and the results do not demonstrate that entrepreneurship integration alone produces these outcomes.

The findings are further supported by recent literature on entrepreneurship education. Bernadó and Bratzke (2024), in their systematic literature review of entrepreneurial competencies, emphasized that entrepreneurial competencies can be developed through learning and are relevant to opportunity identification, value creation, and entrepreneurial behavior. Their findings

support the positive relationship between entrepreneurship integration and business literacy because educational experiences can help students develop the competencies needed to understand and respond to business opportunities.

Similarly, Branca et al. (2025) found that experiential and active learning approaches are effective in developing entrepreneurial self-efficacy, creativity, and innovativeness. This supports the relationship between entrepreneurship integration and career preparedness, as practical learning experiences may help students build confidence and prepare for future business and employment opportunities.

The implication of these findings is that TLE teachers and school administrators should continue strengthening entrepreneurship integration through practical, learner-centered activities. To improve business literacy, students may participate in budgeting exercises, cost and profit computations, market surveys, product pricing, and business planning. To support career preparedness, schools may organize student-led selling activities, business simulations, product-development projects, and interactions with local entrepreneurs. These activities can help students connect theoretical business knowledge with practical applications and develop competencies relevant to employment and self-employment. Although the correlations are strong, the findings should be interpreted as evidence of association rather than proof that entrepreneurship integration directly causes higher business literacy or career preparedness.

Table 6

Relationship Between Students' Participation in Entrepreneurship-Related Activities and Their Business Literacy Levels

Variables	*N*	*r*	r^2	*p*	Decision	Remarks
Participation and business literacy	188	.62	.38	< .001	Reject H_0	Significant

Note. *N* = number of respondents with valid responses on both variables, out of 188 usable questionnaires (200 students invited). *r* = Pearson product-moment correlation coefficient; r^2 = coefficient of determination; *p* = significance level (α = .05).

The results presented in Table 6 reveal a moderate-to-strong positive and statistically significant relationship between students' participation in entrepreneurship-related activities and their business literacy, with a correlation coefficient of $r = .62$, a coefficient of determination of $r^2 = .38$, and a *p*-value of less than .001, based on 188 respondents. Since the *p*-value is below the .05 level of significance, the null hypothesis is rejected. This indicates that students who report greater participation in entrepreneurship-related activities tend to demonstrate higher levels of business literacy. The coefficient of determination suggests that approximately 38% of the variance in business literacy is statistically shared with participation in entrepreneurship-related activities. This finding suggests that practical learning experiences, such as developing products, preparing simple business plans, conducting market surveys, and participating in selling activities, may be relevant to students' understanding of business concepts. However, the correlation does not establish that participation directly causes improvements in business literacy, as other factors may also contribute to students' knowledge and understanding of business.

Recent studies provide further support for this finding. Silveyra-León et al. (2023) examined an entrepreneurship challenge involving 525 undergraduate students and found improvements in entrepreneurial competencies, including opportunity identification, opportunity evaluation, and resource procurement, after participation in the program. This supports the value of involving students in practical entrepreneurship-related activities that allow them to apply business concepts and develop relevant competencies.

Similarly, David (2024) investigated experiential learning among Bachelor of Technology and Livelihood Education students in the Philippines and reported a significant relationship between experiential learning and students' entrepreneurial competencies. This local evidence is particularly relevant to the present study because it involves TLE-related teacher education and highlights the importance of practical learning in entrepreneurship instruction.

In addition, Mack et al. (2024) developed a scale for assessing entrepreneurial knowledge and skills exposure in vocational education, emphasizing the importance of examining how frequently learners encounter core business knowledge and entrepreneurial skills during instruction.

The implication of these findings is that TLE teachers should provide consistent and meaningful opportunities for students to participate in entrepreneurship-related activities. Rather than relying solely on lectures and written exercises, teachers may organize product-development projects, school-based selling activities, business plan presentations, budgeting exercises, and market surveys. These activities can help students connect business concepts with practical experiences, recognize business opportunities, and improve their understanding of financial management, marketing, and operations. Schools may also strengthen partnerships with local entrepreneurs and community businesses to expose students to actual business practices. Through these approaches, entrepreneurship integration can become more experiential and relevant to students' learning needs. Nevertheless,

future studies may use pretest–posttest assessments or experimental designs to determine whether increased participation leads to measurable improvements in business literacy.

Table 7
Relationship Between Students' Participation in Entrepreneurship-Related Activities and Their Preparedness for Future Career Opportunities or Business Ventures

Variables	*N*	*r*	r^2	*p*	Decision	Remarks
Participation and career preparedness	187	.81	.66	< .001	Reject H_0	Significant

Note. *N* = number of respondents with valid responses on both variables, out of 188 usable questionnaires (200 students invited). *r* = Pearson product-moment correlation coefficient; r^2 = coefficient of determination; *p* = significance level (α = .05).

The results presented in Table 7 reveal a strong, positive, and statistically significant relationship between students' participation in entrepreneurship-related activities and their preparedness for future career opportunities or business ventures, with a correlation coefficient of $r = .81$, a coefficient of determination of $r^2 = .66$, and a *p*-value of less than .001, based on 187 respondents. Since the *p*-value is below the .05 level of significance, the null hypothesis is rejected. This indicates that students who report greater participation in entrepreneurship-related activities also tend to report higher levels of career preparedness. The coefficient of determination suggests that approximately 66% of the variance in career preparedness is statistically shared with participation in entrepreneurship-related activities. This strong association highlights the potential importance of experiential learning opportunities, such as product development, business planning, budgeting, marketing, and school-based selling activities, in helping students develop confidence and prepare for future employment or entrepreneurial ventures. Nevertheless, the findings establish an association rather than a causal relationship; therefore, participation should not be interpreted as the sole cause of students' career preparedness.

Recent empirical evidence supports this finding. Bahaw et al. (2024), in a two-wave longitudinal study involving 128 technical and vocational education and training students, found that participation in a six-month entrepreneurship education program was associated with significant increases in entrepreneurial intentions, attitudes toward business creation, and perceived behavioral control. These findings are relevant to the present study because they suggest that sustained entrepreneurship education can strengthen students' confidence and readiness to consider entrepreneurial careers.

Likewise, Silveyra-León et al. (2023) found that students who participated in a structured entrepreneurship challenge demonstrated improvements in entrepreneurial competencies and intentions. Their findings support the value of practical activities that allow students to identify opportunities, evaluate business ideas, and develop resource-management skills.

The implication of these findings is that TLE teachers and school administrators should strengthen students' participation in authentic entrepreneurship-related activities to help prepare them for future employment and business ventures. Students may be encouraged to develop business plans, conduct market research, create and sell products, manage budgets, and participate in school-based entrepreneurial projects. These activities can provide opportunities to practice teamwork, communication, decision-making, and resource management while building confidence in their entrepreneurial capabilities. Schools may also establish partnerships with local entrepreneurs and businesses to expose students to actual workplace practices and possible livelihood opportunities. Since the relationship is strong, schools should continue exploring ways to provide meaningful entrepreneurial experiences while recognizing that career preparedness may also be influenced by students' personal characteristics, family support, access to resources, and other educational experiences.

This study examined students' business literacy, understanding of business concepts, entrepreneurial skills, and career preparedness in relation to the integration of entrepreneurship in Technology and Livelihood Education (TLE). It also investigated the relationships between entrepreneurship integration, students' participation in entrepreneurship-related activities, business literacy, and career preparedness. Based on the findings presented in the preceding chapter, the following results were obtained.

1. Level of Students' Business Literacy. The students demonstrated a high level of business literacy in relation to entrepreneurship integration in TLE, with an overall mean of 3.23 and a standard deviation of 0.49. Understanding the importance of budgeting in business obtained the highest mean of 3.48, verbally interpreted as Very High. This was followed by understanding the importance of planning before starting a business, with a mean of 3.44. Meanwhile, identifying business opportunities within the community obtained the lowest mean of 2.99, although it remained within the High category.

2. Business Concepts Better Understood Through Entrepreneurship Integration. Students demonstrated a high level of understanding of business concepts, with an overall mean of 3.19 and a standard deviation of 0.46. Financial management ranked first, with a mean of 3.22, followed by marketing, with a mean of 3.19, and operations, with a mean of 3.14. All three business

concepts were verbally interpreted as High, indicating that students reported a favorable understanding of fundamental business functions.

3. Level of Students' Entrepreneurial Skills. Students demonstrated a high level of entrepreneurial skills, with an overall mean of 3.24 and a standard deviation of 0.44. Problem-solving skills ranked first, with a mean of 3.27 and a verbal interpretation of Very High. Innovation skills ranked second, with a mean of 3.24, while decision-making skills ranked third, with a mean of 3.21. The latter two indicators were interpreted as High.

4. Extent of Students' Career Preparedness. Students reported a high level of preparedness for future career opportunities and business ventures, with an overall mean of 3.26 and a standard deviation of 0.48. Entrepreneurial confidence ranked first, with a mean of 3.34 and a verbal interpretation of Very High. Confidence to start a business followed with a mean of 3.23, while readiness for employment ranked third, with a mean of 3.20. Both indicators were interpreted as High.

5. Relationship Between Entrepreneurship Integration and Business Literacy and Career Preparedness. A strong, positive, and statistically significant relationship was found between entrepreneurship integration and business literacy (r = .82, r^2 = .68, p < .001; N = 188). Similarly, entrepreneurship integration had a strong, positive, and statistically significant relationship with career preparedness (r = .72, r^2 = .52, p < .001; N = 187). The null hypotheses for both relationships were rejected.

6. Relationship Between Participation in Entrepreneurship-Related Activities and Business Literacy. A positive and statistically significant relationship was found between students' participation in entrepreneurship-related activities and business literacy (r = .62, r^2 = .38, p < .001; N = 188). The null hypothesis was rejected, indicating that greater reported participation was associated with higher reported business literacy.

7. Relationship Between Participation in Entrepreneurship-Related Activities and Career Preparedness. A strong, positive, and statistically significant relationship was found between participation in entrepreneurship-related activities and career preparedness (r = .81, r^2 = .66, p < .001; N = 187). The null hypothesis was rejected, indicating that greater participation was associated with higher perceived career preparedness.

8. Proposed Intervention Program. Based on the findings, a proposed intervention program was developed to strengthen entrepreneurship integration in TLE. The program includes business literacy workshops, financial management exercises, marketing and operations activities, entrepreneurship challenges, career preparation sessions, school-based mini-enterprise projects, and monitoring and evaluation. It includes measurable performance targets and a preliminary estimated budget of ₱26,000 to support implementation, subject to school approval and available resources.

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

1. Students generally demonstrated a high level of business literacy in relation to entrepreneurship integration in TLE. They showed particularly strong understanding of budgeting and business planning, although recognizing business opportunities within the community remained an area for further development.
2. Students reported a high level of understanding of financial management, marketing, and business operations. Financial management received the highest rating, suggesting that students perceived themselves as more familiar with financial concepts than with the other business functions examined.
3. Students demonstrated a high level of entrepreneurial skills, particularly in problem-solving. However, innovation and decision-making may be further strengthened through activities that encourage creativity, evaluation of alternatives, and practical application of entrepreneurial knowledge.
4. Students reported a high level of preparedness for future career opportunities and business ventures. Entrepreneurial confidence was their strongest indicator, while readiness for employment received the lowest rating. This suggests the importance of providing additional opportunities to develop practical workplace competencies and business-starting capabilities.
5. Entrepreneurship integration was significantly and positively associated with both business literacy and career preparedness. These results suggest that students who reported greater entrepreneurship integration also tended to report higher business literacy and career preparedness.
6. Participation in entrepreneurship-related activities was significantly and positively associated with business literacy and career preparedness. This indicates that greater reported participation tended to correspond with higher reported business literacy and perceived readiness for future employment or business ventures.
7. The proposed intervention program was developed to address the areas identified in the findings and sustain students' existing competencies. Through practical, project-oriented, and career-focused activities, the program may provide a

structured basis for strengthening entrepreneurship instruction in TLE. Its effectiveness, however, must be assessed after implementation.

In light of the findings and conclusions of the study, the following recommendations are offered to the identified stakeholders:

Students/Learners. Students are encouraged to actively participate in entrepreneurship-related activities, such as business planning, product development, market surveys, budgeting exercises, and school-based selling projects. They should particularly focus on improving their ability to identify business opportunities within their communities, develop innovative products or services, make informed business decisions, and prepare for future employment or self-employment. These experiences may help them recognize their strengths and areas for improvement in business literacy and entrepreneurial competence.

School Heads and Curriculum Implementers. School heads and curriculum implementers are strongly encouraged to institutionalize the proposed TLE Entrepreneurship Enhancement Program (TEEP), "From Skills to Enterprise," as a regular, school-wide component of TLE entrepreneurship instruction. Institutionalization may be pursued by incorporating the program into the School Improvement Plan and the annual TLE implementation plan, designating a coordinator or committee to oversee it, and including it in the school's regular monitoring and evaluation cycle. They are likewise urged to provide sustained resource support for TEEP, including protected time within the TLE schedule, instructional materials, facilities, and funding for practical entrepreneurial projects, workshops, and mini-enterprise activities. The preliminary estimated budget of ₱26,000 may serve as a starting point for programming these resources, subject to school approval and available funds, while requests for technical and resource assistance may be coordinated with the Schools Division Office, local government units, and community partners. Partnerships with local entrepreneurs and community stakeholders may further strengthen these activities. Implementation may be monitored using measurable indicators, such as student participation rates, completion of business plans, performance assessment results, and accomplishment reports, to determine whether the intended objectives are achieved and to guide decisions on sustaining and improving the program.

TLE Teachers. TLE teachers are encouraged to strengthen the integration of entrepreneurial concepts with practical, experiential learning activities. Lessons may include budgeting and profit computation, product pricing, market research, inventory management, business opportunity identification, product innovation, and business proposal presentations. Particular attention may be given to community-based opportunity recognition, innovation, decision-making, and employment readiness, which received comparatively lower ratings among the indicators examined. Teachers may also use performance-based assessments and structured rubrics to evaluate students' application of business knowledge and entrepreneurial skills. The proposed intervention program may serve as a guide in designing project-oriented activities that promote active participation and practical learning.

Parents. Parents are encouraged to support their children's entrepreneurship learning by discussing household budgeting, responsible spending, product pricing, saving, and simple business practices at home. They may also provide opportunities for learners to observe legitimate small-business activities, understand how family and community enterprises operate, and discuss possible career and livelihood pathways. When appropriate, parents may support school-approved entrepreneurial projects by providing guidance, encouragement, and access to relevant community experiences without compromising students' learning responsibilities.

Future Researchers. Future researchers are encouraged to use the present study as a reference for further investigations into entrepreneurship education, business literacy, entrepreneurial skills, and career preparedness among junior high school learners, particularly in rural or district-level contexts. Similar studies may be conducted in other schools or districts to determine whether the findings are consistent across different educational settings. Researchers may also examine additional factors, such as socioeconomic background, access to entrepreneurial resources, family business exposure, and the nature and frequency of entrepreneurship-related activities. Furthermore, experimental or longitudinal research may be undertaken to evaluate whether specific entrepreneurship interventions produce measurable improvements in students' business literacy, entrepreneurial performance, and career preparedness over time.

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