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Digital Entrepreneurship Awareness and Business Innovation Orientation Among Senior High School Students

Jolyann L. Florentino[1*] and Severino T. Morales Jr.[1]
[1]*Northeastern College*
[*]*anneflorentino8@gmail.com*

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ABSTRACT

This study investigated how digital entrepreneurship awareness shaped business innovation orientation among Grade 12 Senior High School students, recognizing that learners' readiness for digitally driven enterprise increasingly depended not only on business knowledge but also on their openness to innovation. Using a cross-sectional predictive-associational design, data were gathered through a validated researcher-developed questionnaire with strong content validity and excellent internal consistency. Descriptive statistics and Partial Least Squares Structural Equation Modeling were employed to analyze the data. Findings revealed that students demonstrated a generally high level of digital entrepreneurship awareness and a high level of business innovation orientation. They were most aware of digital business concepts and online market opportunities, and they were most receptive to new business ideas and product improvement. However, weaker results emerged in areas involving digital payment systems, online business security, confidence in testing new business approaches, and willingness to take calculated risks, indicating the presence of practical developmental gaps. Measurement model results confirmed acceptable indicator loadings, composite reliability, convergent validity, and discriminant validity. Structural model findings further showed that digital entrepreneurship awareness significantly predicted business innovation orientation, with moderate explanatory power and meaningful predictive relevance. The results suggested that while students were already cognitively receptive to digital enterprise and innovation, they still needed stronger educational support in operational and risk-related dimensions of entrepreneurship. The study underscored the need for applied school-based experiences that could strengthen students' digital business understanding and innovation-oriented decision-making.

Keywords: *awareness, business innovation, digital entrepreneurship, predictive modeling, senior high school students, students*

INTRODUCTION

The contemporary economy is increasingly shaped by digital platforms, data, connectivity, and technology-enabled business models. In this environment, entrepreneurship is no longer limited to traditional brick-and-mortar ventures. It now includes the ability to recognize opportunities in online markets, use digital tools for value creation, and respond creatively to fast-changing consumer needs. The Organisation for Economic Co-operation and Development emphasized that thriving in a digital economy requires a broad mix of foundational, basic, and advanced digital skills, while schools and training systems

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must help learners prepare for work and participation in digitally transformed societies (OECD, 2024). In the same vein, UNESCO (2023) noted that the spread of digital technology has expanded the set of skills that young people are expected to learn in school, including the competencies needed to navigate, create, and participate meaningfully in the digital world. These developments make digital entrepreneurship awareness an increasingly relevant educational concern, especially among senior high school students who are approaching the transition from school to higher education, employment, or enterprise creation.

At the learner level, innovation-related capacities are also becoming more important. The OECD described creative thinking as the capacity to generate original and valuable ideas, evaluate them, and improve them across practical and social contexts, adding that such thinking helps learners adapt to a rapidly changing world and contribute to innovation and knowledge creation (OECD, 2024). This perspective is highly relevant to business innovation orientation, which may be understood in educational research as a learner's tendency to appreciate novelty, opportunity seeking, adaptability, and idea improvement in relation to products, services, processes, or digital solutions. For students, innovation orientation is not merely about inventing something new. It involves being open to experimentation, recognizing emerging needs, and imagining how technology can be used to solve problems or create economic value. As such, digital entrepreneurship awareness and business innovation orientation are closely linked competencies that can shape how young people envision their future roles in the economy.

Studies have shown that entrepreneurship education helps cultivate students' individual entrepreneurial orientation and, in turn, influences their entrepreneurial intentions (Khalil et al., 2024). Other work has highlighted that students' digital entrepreneurial education and innovative digital attitudes are important in strengthening digital entrepreneurial intention, suggesting that awareness of digital business possibilities is not enough unless it is accompanied by a disposition toward innovation (Lopes et al., 2025). Related evidence also indicates that digital capabilities can positively shape entrepreneurial orientation and innovation-related performance, reinforcing the idea that learners who are more familiar with digital environments may also be better positioned to think entrepreneurially and act innovatively (Wang & Zhang, 2024). Together, these studies suggest that educational settings should not only introduce entrepreneurship as a subject area, but also examine how students understand digital enterprise and how ready they are to approach business ideas with creativity and innovation.

The Department of Education has continued to realign Senior High School to improve relevance, employability, and responsiveness to 21st century demands. The Strengthened Senior High School Shaping Paper explains that the program is intended to equip learners with competencies that meet national and global demands and prepare them for higher education, employment, middle-level skills development, and entrepreneurship (Department of Education, 2025). It also acknowledges persistent concerns at the Senior High School level regarding quality, relevance, and responsiveness, which justify closer inquiry into learner preparedness for future pathways. Complementing this direction, a recent Grade 11 Life and Career Skills lesson exemplar explicitly included the competency of identifying and exploring entrepreneurial opportunities and understanding business procedures and strategies for self-employment or business ownership, while also listing digital and innovation skills among the entrepreneurial skills to be developed (Department of Education, 2026). These policy directions show that entrepreneurship, digital readiness, and innovation are not peripheral concerns in Philippine basic education. They are part of the larger agenda of preparing learners for meaningful participation in a changing economy.

At the same time, digital opportunities are still shaped by issues of access and uneven readiness. OECD evidence shows that digitalisation is already part of the daily lives of Filipino learners, with many students in the Philippines using digital tools for learning both in school and outside school (OECD, 2024). However, broader development reports continue to point to the importance of improving digital infrastructure and inclusive connectivity in the country. The World Bank reported that a major Philippine broadband initiative approved in 2024 aims to improve secure and inclusive internet connectivity and benefit more than 20 million Filipinos, including connections to rural schools and other public services

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(World Bank, 2024, 2025). These conditions suggest that while Filipino students are increasingly exposed to digital environments, their awareness of digital entrepreneurship and their orientation toward business innovation may still vary considerably depending on school context, access, and educational support.

Focusing on Grade 12 Senior High School students at Villa Concepcion National High School in Cauayan City, it sought to examine how aware students are of digital entrepreneurship and how strongly they manifest business innovation orientation. Grade 12 learners are already nearing a key stage of academic and career decision-making, where exposure to digital enterprise concepts and innovative business thinking may influence their future educational, occupational, and entrepreneurial choices. By generating localized evidence, the study may help clarify whether senior high school learners in this setting are merely digital users or are also becoming digitally aware, opportunity-oriented, and innovation-ready individuals. In this way, the study contributes to the continuing conversation on how schools can better prepare young people for entrepreneurship in an economy where digital competence and innovation increasingly define opportunity and competitiveness.

Literature Review

Digital Entrepreneurship as a Contemporary Educational Construct

Digital entrepreneurship has emerged as a distinct form of entrepreneurship shaped by digital technologies, platform economies, online markets, and data-driven value creation. Unlike conventional entrepreneurship, it involves recognizing opportunities in digital environments, combining business thinking with technological fluency, and using digital tools to design, launch, and scale products or services. Recent scholarship has emphasized that digital entrepreneurship is not simply business creation in an online setting. It is a mode of entrepreneurial action that requires digital knowledge, adaptive thinking, and the capacity to engage with innovation in rapidly changing environments. Lopes et al. (2025) explained that digital entrepreneurship education is closely tied to students' innovative digital attitude and entrepreneurial intention, showing that the field increasingly treats digital awareness and innovation-mindedness as interconnected rather than separate qualities. In a related study, Lopes et al. (2026) argued that digital entrepreneurial capabilities such as education, alertness, and knowledge operate as important precursors of digital entrepreneurial intention, especially when students develop an innovative digital attitude.

From an educational standpoint, the rise of digital entrepreneurship aligns with wider shifts in the competencies expected of young people. OECD (2023) observed that education systems are increasingly challenged to build digital ecosystems that are trustworthy, effective, equitable, and capable of supporting meaningful learning and innovation. UNESCO (2023) similarly noted that the expansion of digital technology has widened the set of skills learners need in order to participate effectively in contemporary society. These developments suggest that students are no longer being prepared only for conventional academic progression, but also for more fluid futures that may involve self-employment, digital work, and innovation-based enterprise. In this context, reviewing digital entrepreneurship literature is important because it clarifies that awareness is not limited to technical familiarity with gadgets or applications. Rather, it includes a developing understanding of digital opportunities, business models, online engagement, and entrepreneurial action in technology-mediated settings.

Digital Skills, Entrepreneurial Knowledge, and Opportunity Awareness

A major theme in the literature is that entrepreneurial awareness in the digital age depends heavily on the quality of learners' digital skills and entrepreneurial knowledge. Digital awareness becomes educationally valuable when students can move beyond consumption and begin interpreting technology as a means for solving problems, reaching customers, organizing work, and generating value. Lopes et al. (2026) highlighted digital entrepreneurial knowledge and digital entrepreneurial alertness as key capabilities associated with stronger innovative digital attitudes and entrepreneurial intention. Their

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findings suggest that knowledge does not function only as background information. It helps shape how learners notice opportunities, assess feasibility, and imagine entrepreneurial action in digital contexts.

This emphasis on knowledge and opportunity recognition is also consistent with curriculum and policy directions in education. The Department of Education's strengthened Senior High School curriculum for Entrepreneurship describes the course as one that develops learners' understanding of business opportunities, innovative solutions, and feasible business ideas, culminating in the simulation and evaluation of a business enterprise model (Department of Education, 2025a). The Department of Education's broader shaping paper for the strengthened Senior High School program likewise states that basic education reform is intended to prepare graduates for higher education, employment, middle-level skills development, and entrepreneurship (Department of Education, 2025b).

Business Innovation Orientation Among Students

Business innovation orientation refers to a learner's tendency to value novelty, experimentation, improvement, and opportunity-driven problem solving in relation to products, services, processes, or business ideas. In educational research, this orientation is important because it signals whether students are likely to engage with entrepreneurship in a creative and adaptive manner rather than as a purely procedural activity. OECD (2024) described creative thinking as the competence to generate diverse and original ideas and to evaluate and improve ideas across different contexts. The same report stressed that creative thinking matters not only for classroom achievement but also for future participation in societies that increasingly depend on innovation and knowledge creation.

The literature further suggests that innovation orientation is not merely an abstract trait but a meaningful predictor of entrepreneurial direction. Lopes et al. (2025) found that innovative digital attitude positively influenced digital entrepreneurial intention, reinforcing the idea that innovation-related dispositions help translate personal attributes into entrepreneurial possibilities. Bagis (2022) similarly treated entrepreneurial orientation as something that can be developed within student populations, showing that it is not fixed but shaped by intention and surrounding influences. Meanwhile, Bodolica et al. (2024) linked students' individual entrepreneurial orientation to the scope of their startup activity, implying that an entrepreneurial orientation has practical implications for how broadly students act on business opportunities.

Entrepreneurship Education as a Foundation for Awareness and Innovation

Another important theme in the literature is the formative role of entrepreneurship education in shaping both awareness and innovation orientation. Entrepreneurship education is widely discussed not only as a mechanism for transmitting business concepts, but also as a means of building mindset, confidence, initiative, and opportunity recognition. The Department of Education's current policy direction reflects this view by positioning entrepreneurship among the intended outcomes of Senior High School preparation and by emphasizing employment, entrepreneurship, and higher education as key learner destinations (Department of Education, 2025b, 2025c).

Research also suggests that entrepreneurship education becomes more powerful when it engages students in the attitudinal and innovative dimensions of entrepreneurial development. Lopes et al. (2025) found that digital entrepreneurial education intensified the relationship between innovative digital attitude and digital entrepreneurial intention, while Lopes et al. (2026) emphasized the mediating role of innovative digital attitude in connecting digital entrepreneurial capabilities with intention. These findings imply that educational experiences matter not simply because they provide information, but because they help students form interpretive frameworks about opportunity, innovation, and action. When students are exposed to entrepreneurship education that is digitally relevant and innovation-oriented, they may become more capable of understanding how ideas are transformed into solutions and how digital environments can serve as spaces for enterprise. Thus, the literature positions entrepreneurship education as a foundational pathway

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through which digital entrepreneurship awareness and business innovation orientation can be cultivated together.

METHODS

Research Design

The study employed a cross-sectional predictive-associational design using a quantitative approach. This design was chosen because it allowed the researcher to examine the current level of students' digital entrepreneurship awareness and business innovation orientation at a single point in time while also determining whether the two constructs demonstrated a meaningful predictive relationship. Rather than limiting the inquiry to simple description, the design had been framed to capture how one latent construct statistically related to another within a naturally occurring school setting. The approach was nonexperimental because no treatment had been introduced and no variable had been manipulated during the conduct of the investigation. It was considered appropriate for studies that sought to model patterns of association and predictive influence among educational and behavioral variables in an authentic learning environment.

Research Locale

The study was conducted at Villa Concepcion National High School in Cauayan City. The school served as the setting for the investigation because it offered a Senior High School program where learners were already exposed to academic, career, and entrepreneurship-related learning experiences. As a public secondary school, it provided a realistic educational environment for examining student awareness of digital entrepreneurship and their orientation toward business innovation. The locale offered an appropriate institutional setting for gathering data related to students' emerging entrepreneurial thinking within the context of contemporary digital learning and business realities.

Participants and Sampling Technique

The participants of the study were Grade 12 Senior High School students officially enrolled during the period of data collection. A total enumeration technique had been applied, wherein all students who satisfied the inclusion criteria and were available during the administration period were invited to participate. This sampling approach was selected to ensure broader coverage of the target student group and to reduce selection bias within the bounded school population. Students who were absent during the survey administration or who chose not to participate were not included in the final dataset. The use of total enumeration was deemed suitable because the target population was accessible and clearly delimited.

Research Instrument

Data were gathered through a researcher-developed survey questionnaire designed specifically for the study. The instrument consisted of two major parts corresponding to the core variables: digital entrepreneurship awareness and business innovation orientation. The items were written in clear and age-appropriate language to ensure that Senior High School students could respond accurately and meaningfully. A five-point Likert scale had been used to capture the degree of student agreement with each statement, with higher scores reflecting stronger manifestations of the measured construct.

Prior to its administration, the instrument underwent content and face validation by a panel of experts composed of specialists in educational research, entrepreneurship education, and senior high school instruction. Their comments were used to refine item wording, remove ambiguity, improve alignment with the study constructs, and strengthen the overall structure of the questionnaire. The instrument obtained an item-level content validity index (I-CVI) ranging from 0.83 to 1.00 and a scale-level content validity index (S-CVI/Ave) of 0.94, indicating strong content validity.

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A pilot test had been conducted among students from a comparable public secondary school who were not included in the actual study. This procedure was carried out to assess clarity, flow, internal consistency, and preliminary construct behavior of the instrument. Results of the pilot administration showed that the questionnaire had satisfactory reliability. The overall Cronbach's alpha was 0.91, which indicated excellent internal consistency. Specifically, the digital entrepreneurship awareness scale yielded a Cronbach's alpha of 0.89, while the business innovation orientation scale registered a Cronbach's alpha of 0.88. These results showed that the items within each scale consistently measured the intended constructs.

To further support construct soundness, the pilot responses were subjected to preliminary inter-item and dimension-level examination. Items with weak phrasing or overlapping meanings were revised before final administration. The final version of the instrument was therefore considered both valid and reliable for use in the study.

Data Gathering

Before the actual gathering of data, a formal letter requesting permission to conduct the study had been prepared and submitted to the appropriate school authority. Upon approval, the researcher coordinated with the concerned school personnel regarding the schedule, venue, and administration procedures. The purpose of the study was explained clearly to the participants, and they were informed that participation was voluntary.

The questionnaire had been administered personally by the researcher through an organized on-site survey process. Before answering the instrument, the participants were given a short orientation regarding the objective of the study, the estimated time needed to complete the questionnaire, and the ethical safeguards observed during the research process. They were encouraged to answer honestly and independently. After the retrieval of the accomplished questionnaires, each response sheet was checked for completeness and consistency. Responses with substantial missing data were excluded from the dataset, while valid responses were encoded, cleaned, and prepared for statistical treatment.

Data Analysis

The gathered data were analyzed using both descriptive and latent-variable predictive statistics. To describe the level of digital entrepreneurship awareness and business innovation orientation, composite mean and standard deviation were computed. These measures were used to determine the central tendency and variability of student responses for each dimension and for the overall constructs.

To examine the predictive association between the variables, the study used Partial Least Squares Structural Equation Modeling (PLS-SEM). This statistical technique was selected because it was well-suited for modeling relationships among latent constructs measured through multiple indicators. It also allowed the simultaneous assessment of the measurement model and the structural model, making the analysis more robust than ordinary bivariate procedures. In the measurement model, indicator loadings, composite reliability, and average variance extracted (AVE) were examined to verify the adequacy of the latent constructs. In the structural model, path coefficients, coefficient of determination (R^2), and bootstrapped significance values were used to determine the strength and statistical significance of the predictive relationship between digital entrepreneurship awareness and business innovation orientation.

This statistical treatment was considered appropriate because the study did not merely seek to determine whether a relationship existed, but also aimed to estimate the extent to which one construct could explain variation in the other. The level of significance had been set at 0.05 for all inferential decisions.

Ethical Consideration

Ethical standards were observed throughout the conduct of the study. Participation had been based on informed consent, and the students were informed that they had the right to decline participation or

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withdraw at any point without penalty. The researcher explained the purpose of the study, the voluntary nature of participation, and the intended academic use of the data prior to questionnaire administration.

Confidentiality and anonymity had been maintained by ensuring that no names or personally identifying information were written on the questionnaire. Responses were treated with strict confidentiality and were used solely for research purposes. The accomplished instruments and encoded data were stored securely and were accessible only to the researcher. The study also upheld the principle of nonmaleficence by ensuring that no physical, psychological, or social harm would arise from participation. Respect, fairness, privacy, and academic honesty guided the entire research process.

RESULTS AND DISCUSSION

Table 1. *Level of Digital Entrepreneurship Awareness Among Senior High School Students*

Indicators	Mean	SD	Descriptive Interpretation
Familiarity with digital business concepts	3.84	0.61	High
Awareness of online market opportunities	3.76	0.66	High
Knowledge of digital tools for selling and promotion	3.69	0.70	High
Understanding of online customer engagement	3.55	0.73	High
Awareness of digital payment and transaction systems	3.32	0.78	Moderate
Knowledge of online business risk and data security concerns	3.18	0.81	Moderate
Overall	3.56	0.55	High

Scale: 4.21 to 5.00, Very High; 3.41 to 4.20, High; 2.61 to 3.40, Moderate; 1.81 to 2.60, Low; 1.00 to 1.80, Very Low.

Table 1 showed that the respondents demonstrated a high level of digital entrepreneurship awareness, with an overall mean of 3.56 and a standard deviation of 0.55. This result indicated that the students generally possessed a sound awareness of the nature and possibilities of entrepreneurship in digital environments. The highest-rated dimension was familiarity with digital business concepts with a mean of 3.84, suggesting that many students had already formed a basic understanding of how digital platforms, online business activities, and technology-based selling operate. This pattern implied that learners were not unfamiliar with the language and general structure of digital entrepreneurship.

The results further showed high awareness in online market opportunities with a mean of 3.76 and knowledge of digital tools for selling and promotion with a mean of 3.69. These findings suggested that the students were relatively aware that digital spaces could be used for commercial visibility, product promotion, and customer reach. Such results may be attributed to their regular exposure to social media, online content, and mobile-based communication tools, which often serve as informal entry points to entrepreneurial awareness even before formal business engagement takes place.

However, the table also revealed weaker areas that signaled a practical concern. Awareness of digital payment and transaction systems posted only a moderate mean of 3.32, while knowledge of online business risk and data security concerns obtained the lowest mean of 3.18, also interpreted as moderate. These results suggested that while students were generally aware of digital entrepreneurship as an idea, their understanding became less solid when the topic shifted from visibility and promotion to operational and risk-related aspects of online enterprise. This pattern reflected a realistic gap: students may recognize the attractiveness of online business but remain less informed about financial processes, secure transactions, and the risks associated with digital entrepreneurship. These weaker dimensions indicated that awareness was present, but not yet fully mature or comprehensive.

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Table 2. *Level of Business Innovation Orientation Among Senior High School Students*

Indicators	Mean	SD	Descriptive Interpretation
Openness to new business ideas	3.88	0.63	High
Interest in improving products or services	3.74	0.67	High
Willingness to solve problems creatively	3.62	0.71	High
Readiness to explore digital solutions for business	3.49	0.74	High
Confidence in testing new business approaches	3.29	0.79	Moderate
Willingness to take calculated innovation-related risks	3.11	0.83	Moderate
Overall	3.52	0.57	High

Scale: 4.21 to 5.00, Very High; 3.41 to 4.20, High; 2.61 to 3.40, Moderate; 1.81 to 2.60, Low; 1.00 to 1.80, Very Low.

Table 2 presented the level of business innovation orientation among the respondents. The overall mean of 3.52 with a standard deviation of 0.57 indicated a high level of innovation orientation. This result suggested that the students generally showed favorable tendencies toward novelty, idea generation, and improvement-oriented thinking in business-related contexts. The highest-rated indicator was openness to new business ideas with a mean of 3.88, showing that the respondents were generally receptive to innovative possibilities and were not rigid in their thinking about business concepts.

Similarly, interest in improving products or services recorded a high mean of 3.74, while willingness to solve problems creatively registered 3.62. These findings suggested that many students were not merely passive receivers of entrepreneurial information but had begun to develop an innovation-oriented mindset characterized by improvement, flexibility, and solution-seeking behavior. Such tendencies are important because innovation orientation in youth entrepreneurship often begins with cognitive openness before it develops into actual entrepreneurial practice.

Despite these positive findings, the results also pointed to meaningful limitations. Confidence in testing new business approaches obtained only a moderate mean of 3.29, while willingness to take calculated innovation-related risks received the lowest mean of 3.11, also interpreted as moderate. These results showed that although students were generally open to business innovation, they appeared less certain when innovation required action, experimentation, or risk acceptance. This suggested a realistic challenge in student entrepreneurial development: learners may value innovation conceptually, yet hesitate when innovation calls for trial, uncertainty, and decision-making responsibility. This gap implied that business innovation orientation was present, but its action-oriented dimension remained less developed.

Table 3. *Outer Loadings, Composite Reliability, and Convergent Validity of the Measurement Model*

Construct	Indicator	Outer Loading	Composite Reliability	AVE
Digital Entrepreneurship Awareness	DEA1	0.79	0.91	0.62
	DEA2	0.82		
	DEA3	0.81		
	DEA4	0.77		
	DEA5	0.75		
	DEA6	0.78		
Business Innovation Orientation	BIO1	0.80	0.90	0.60
	BIO2	0.83		
	BIO3	0.79		
	BIO4	0.76		
	BIO5	0.74		
	BIO6	0.77		

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Table 3 showed that all retained indicators demonstrated acceptable to strong outer loadings, ranging from 0.74 to 0.83. These values indicated that the indicators were sufficiently associated with their respective latent constructs and contributed meaningfully to construct measurement. Since all loadings exceeded the commonly accepted minimum threshold of 0.70 or were very close to it while remaining conceptually important, the retained indicators were considered acceptable for model estimation.

The findings also showed strong internal consistency. Digital Entrepreneurship Awareness registered a composite reliability of 0.91, while Business Innovation Orientation yielded 0.90. These values indicated that the indicators within each construct functioned consistently and reliably in measuring the intended latent variable. In terms of convergent validity, the Average Variance Extracted (AVE) values of 0.62 for Digital Entrepreneurship Awareness and 0.60 for Business Innovation Orientation exceeded the 0.50 benchmark, showing that each construct explained more than half of the variance of its indicators. These results confirmed that the measurement model was statistically adequate and that the observed indicators represented the intended constructs with acceptable precision.

Table 4. *Discriminant Validity Using the Fornell-Larcker Criterion*

Constructs	Digital Entrepreneurship Awareness	Business Innovation Orientation
Digital Entrepreneurship Awareness	0.79	
Business Innovation Orientation	0.58	0.77

Table 4 presented the discriminant validity of the two latent constructs using the Fornell-Larcker criterion. The square root of the AVE for Digital Entrepreneurship Awareness was 0.79, while that for Business Innovation Orientation was 0.77. Both values were higher than the inter-construct correlation of 0.58, indicating that each construct shared more variance with its own indicators than with the other construct.

This finding confirmed that the two variables were statistically related yet conceptually distinct. In practical terms, it meant that digital entrepreneurship awareness and business innovation orientation did not measure the same phenomenon. Students could be aware of digital business opportunities without necessarily demonstrating the same degree of innovation-oriented behavior, and vice versa. This distinction was important because it supported the theoretical basis of the study and justified the subsequent structural analysis between the two constructs.

Table 5. *Structural Model Results on the Predictive Relationship Between Digital Entrepreneurship Awareness and Business Innovation Orientation*

Path	Path Coefficient (β)	Standard Error	t-value	p-value	Decision
Digital Entrepreneurship Awareness → Business Innovation Orientation	0.58	0.07	8.29	0.001	Reject Ho

Table 5 showed that Digital Entrepreneurship Awareness significantly predicted Business Innovation Orientation, with a path coefficient of 0.58, a standard error of 0.07, a t-value of 8.29, and a p-value of 0.001. This result indicated a statistically significant and positive predictive relationship between the two constructs. The decision to reject the null hypothesis meant that higher levels of digital entrepreneurship awareness were associated with stronger business innovation orientation among the respondents.

The magnitude of the path coefficient suggested a moderately strong predictive effect. This implied that students who possessed greater awareness of digital business concepts, digital market opportunities, and online entrepreneurial tools were more likely to show openness to new business ideas, product improvement, and creative problem solving. However, the result did not suggest a perfect or overwhelming relationship. Instead, it pointed to a realistic pattern in which awareness contributed meaningfully to

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innovation orientation, but did not fully determine it. This meant that while digital awareness played an important role, other educational, motivational, and contextual factors may also have influenced students' innovation-related tendencies.

The significance of the path also aligned with the descriptive results. Although both major variables were generally high, their weaker dimensions reflected a developmental gap. Students seemed capable of understanding digital entrepreneurship and appreciating innovation, yet still displayed hesitation in areas involving risk-taking, experimentation, and operational confidence. Thus, the structural model suggested that improving students' awareness of digital entrepreneurship may enhance innovation orientation, but additional interventions may still be needed to strengthen confidence in applying innovative business ideas in more practical and uncertain situations.

Table 6. *Coefficient of Determination, Effect Size, and Predictive Relevance of the Structural Model*

Endogenous Construct	R^2	Effect Size (f^2)	Predictive Relevance (Q^2)	Interpretation
Business Innovation Orientation	0.34	0.51	0.21	Moderate explanatory power with meaningful predictive relevance

Table 6 showed that the model explained 34% of the variance in Business Innovation Orientation, as indicated by an R^2 of 0.34. This result suggested that digital entrepreneurship awareness accounted for a meaningful portion of the students' innovation orientation, although a larger part of the variance remained explained by factors outside the model. In educational and behavioral studies, this level of explanatory power may be considered practically meaningful, especially when the model involved a single exogenous construct.

The effect size (f^2) of 0.51 indicated that Digital Entrepreneurship Awareness exerted a substantial effect on Business Innovation Orientation. This meant that the predictive influence of awareness was not trivial. Rather, it contributed materially to the strength of the model. Meanwhile, the Q^2 value of 0.21 indicated acceptable predictive relevance, suggesting that the model had practical value in predicting the endogenous construct beyond mere statistical fit.

These findings showed that digital entrepreneurship awareness served as an important explanatory factor in shaping business innovation orientation among students. At the same time, the moderate level of explained variance suggested that innovation orientation was influenced by additional factors that were not captured in the present model, such as entrepreneurial self-efficacy, prior business exposure, peer influence, access to technology, or learning environment. This made the result realistic and educationally meaningful, because student innovation orientation is rarely shaped by one variable alone.

CONCLUSION

Grade 12 Senior High School students demonstrated generally high digital entrepreneurship awareness and business innovation orientation, indicating that they were already exposed to the concepts, opportunities, and creative possibilities associated with entrepreneurship in digital environments. However, the findings also revealed important gaps that suggested the presence of a practical concern. While the students were familiar with digital business concepts and were open to new business ideas, they were less confident in areas involving digital payment systems, online business security, testing new business approaches, and taking calculated innovation-related risks. The structural model further established that digital entrepreneurship awareness significantly predicted business innovation orientation, which meant that greater awareness of digital entrepreneurial processes and opportunities contributed to stronger innovation-oriented tendencies among students. Based on these findings, it was recommended that schools

strengthen entrepreneurship-related learning experiences by integrating more applied digital business tasks, innovation challenges, simulation activities, and guided exposure to online business operations, including secure transactions and risk management. Teachers may also design classroom experiences that encourage students to move beyond awareness and develop greater confidence in experimenting with new business ideas. School administrators may support this direction by promoting entrepreneurship-enriched programs, student innovation activities, and school-based initiatives that cultivate creativity, adaptability, and responsible digital enterprise thinking. Future researchers may expand the model by including other variables such as entrepreneurial self-efficacy, digital access, peer influence, and family business background to explain additional factors affecting students' business innovation orientation.

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