Digital marketing-based entrepreneurship learning: impact on self-confidence and entrepreneurial intentions of physical education students

Aprendizaje del emprendimiento basado en el marketing digital: impacto en la autoconfianza y las intenciones emprendedoras de los estudiantes de educación física

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Abstract

Introduction: Entrepreneurship learning in the digital era plays a crucial role in equipping students with the knowledge, skills, and confidence required to face economic challenges and pursue independent career paths. This is particularly relevant for physical education students, who often encounter limited career options and require alternative competencies to build entrepreneurial ventures.

Objective: This study aims to examine the influence of students' perceptions of digital marketing-based entrepreneurship learning on their entrepreneurial intentions and self-efficacy. Methodology: The study employed a quantitative research design using a survey method. The population consisted of 849 physical education students, and the sample size of 87 respondents was determined using the Slovin formula. Data were collected through structured questionnaires and analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach.

Discussion: The results indicate that students' perceptions of digital marketing-based entrepreneurship learning significantly predict entrepreneurial intention ($R^2 = 0.384$) and entrepreneurial self-efficacy ($R^2 = 0.538$). These findings suggest that students who view digital marketing as an integral part of their entrepreneurship education are more likely to feel confident in their abilities and are more motivated to pursue entrepreneurial endeavors.

Conclusions: Digital marketing-based entrepreneurship education can be a powerful tool in developing entrepreneurial mindsets among physical education students. The study highlights the need to incorporate digital marketing components into entrepreneurship curricula to foster stronger intentions and higher levels of self-efficacy. These findings provide valuable implications for curriculum developers and policymakers in the field of physical education and entrepreneurship education.

Keywords

Entrepreneurship learning; digital marketing; entrepreneurial intention; efficacy; physical education students.

Resumen

Introducción: El aprendizaje del emprendimiento en la era digital es esencial para dotar a los estudiantes de conocimientos, habilidades y confianza necesarios para afrontar desafíos económicos y construir trayectorias profesionales independientes. Esto resulta particularmente relevante para los estudiantes de educación física, quienes a menudo enfrentan opciones laborales limitadas.

Objetivo: Este estudio analiza la influencia de las percepciones de los estudiantes sobre el aprendizaje del emprendimiento basado en el marketing digital en su intención emprendedora y autoeficacia.

Metodología: Se aplicó un enfoque cuantitativo mediante una encuesta. La población estuvo compuesta por 849 estudiantes de educación física, y el tamaño de la muestra, determinado mediante la fórmula de Slovin, fue de 87 participantes. Los datos fueron analizados con el método de Modelado de Ecuaciones Estructurales mediante Mínimos Cuadrados Parciales (PLS-SEM).

Discusión: Los resultados muestran que la percepción del aprendizaje del emprendimiento basado en marketing digital predice significativamente la intención emprendedora ($R^2 = 0.384$) y la autoeficacia ($R^2 = 0.538$). Esto indica que los estudiantes que valoran positivamente este tipo de formación tienden a sentirse más capaces y motivados para emprender.

Conclusiones: La incorporación del marketing digital en la enseñanza del emprendimiento representa una estrategia eficaz para fortalecer la intención y la autoeficacia emprendedora en estudiantes de educación física. Los hallazgos tienen implicaciones directas para el diseño curricular y la formulación de políticas educativas más adaptadas a las exigencias del entorno digital actual.

Palabras clave

Aprendizaje empresarial; marketing digital; intención emprendedora; eficacia; estudiante de educación física.

Introduction

Education is a conscious and structured effort to equip students with the necessary skills to develop their potential through learning. Entrepreneurship education has been widely recognized as a key driver of economic development and innovation (Suleiman & Ahmed, 2022) yet its implementation in physical education curricula remains underexplored. One essential aspect of education is entrepreneurship learning, which aims to instill knowledge, attitudes, and skills that enable students to live independently by becoming entrepreneurs (Fathoni et al., 2024; Sadewa et al., 2025). However, in Indonesia, entrepreneurship education has not significantly increased entrepreneurial intentions among physical education students (Lestari et al., 2023). This issue is critical because, despite the increasing emphasis on entrepreneurship programs, many graduates from physical education backgrounds still prefer seeking employment over starting their businesses (Setiawan et al., 2024). This highlights the necessity of evaluating not only the presence of entrepreneurship education but also its effectiveness in fostering entrepreneurial intentions. The low entrepreneurial intention among these students indicates a fundamental problem in the current entrepreneurship education system, which needs to be examined in depth (Hastuti et al., 2024). This research addresses this gap by exploring how digital marketing-based entrepreneurship education can enhance students' entrepreneurial intentions and self-efficacy.

Entrepreneurship education fosters motivation and interest. It effectively empowers students to be imaginative and creative in establishing new businesses (Mohammed, 2025). Research indicates that high motivation, interest, and creativity contribute significantly to students' entrepreneurial intentions (Almonacid Hurtado et al., 2023). An appropriate curriculum design and learning methods are essential to nurture students into future entrepreneurs (Silveira Pérez et al., 2019). Nevertheless, while some studies affirm the positive influence of entrepreneurship education on business intentions (Álvarez & Zúñiga, 2022), others highlight its limitations in fostering entrepreneurial confidence and willingness to take risks (Estelami, 2020; Vodă et al., 2019). Additionally, despite its importance, there is still a lack of consensus on which pedagogical approaches are most effective in bridging the gap between theoretical knowledge and practical application. This contrast suggests that while entrepreneurship education provides theoretical knowledge (Lv et al., 2021), it may not sufficiently equip students with the practical skills and confidence required for business success.

The theoretical foundation of this study is based on the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT). TPB posits that entrepreneurial intentions are influenced by attitudes, subjective norms, and perceived behavioral control (Lim et al., 2021). Meanwhile, SCT emphasizes the role of self-efficacy in shaping entrepreneurial behavior (Shetty et al., 2023). Although these theories have been widely used in entrepreneurship education research, their specific interactions in the context of digital marketing-based learning have not been extensively examined. Prior studies tend to treat these theories separately rather than as complementary frameworks that provide a holistic view of entrepreneurial learning. This study aims to bridge that gap by examining how perceptions of digital marketing-based learning influence students' entrepreneurial intentions and self-efficacy.

The role of self-efficacy in entrepreneurship is well-documented. Sarman et al. (2025) and Caliendo et al. (2023) assert that self-efficacy influences entrepreneurial behavior and business success. Studies from various countries, such as Uganda (Ogba et al., 2022) and Nigeria (Baluku et al., 2020), highlight the importance of self-efficacy in fostering entrepreneurial interest. Furthermore, research confirms that entrepreneurial efficacy is a key precursor to entrepreneurial intentions and behavior (Ramos et al., 2024; Tauda et al., 2025). A lack of self-efficacy can hinder students from developing a strong entrepreneurial mindset, which is crucial for launching and sustaining businesses (Romero et al., 2022). Given the inconsistency in entrepreneurship education outcomes, there is a need for an innovative approach that can enhance both entrepreneurial intentions and self-efficacy among students. Digital marketing-based entrepreneurship education presents a promising solution. Traditional entrepreneurship education often lacks practical exposure to modern business practices, particularly in digital markets (Sitaridis & Kitsios, 2024). Digital marketing provides students with hands-on experience in promoting and selling products online, which aligns with contemporary business demands (Jáki et al., 2023). This approach allows students to leverage technology to market their products effectively and develop a stronger entrepreneurial mindset (Rohm et al., 2021). Digital marketing strategies such as social media

advertising, search engine optimization, and e-commerce platforms provide real-time business exposure, which helps students develop business acumen and adaptability (Lai & Yu, 2021). Previous studies have primarily focused on business and management students, leaving a gap in understanding how digital marketing entrepreneurship education influences students from non-business disciplines, particularly physical education. Therefore, this study seeks to clarify these gaps by investigating the direct impact of digital marketing-based entrepreneurship education on students' entrepreneurial readiness..

Focusing on physical education students is particularly relevant given their limited exposure to entrepreneurship education compared to students from business-related fields. According to Seet et al. (2023), career uncertainty in the sports and physical education sectors further underscores the need for alternative career pathways. Research suggests that integrating digital marketing into entrepreneurship education can help these students develop alternative income sources, such as fitness consulting, sports merchandising, and online coaching services (Mastromartino, 2024). However, while previous research has recognized the need for alternative career development in physical education, few studies have empirically examined whether digital marketing-based entrepreneurship education effectively enhances entrepreneurial competence in this context. By addressing these unique challenges, this study aims to provide insights into how digital marketing strategies can enhance the entrepreneurial mindset of physical education students.

This research aims to examine the impact of digital marketing-based entrepreneurship education on the entrepreneurial intentions and self-efficacy of physical education students. This study will contribute to the existing literature by offering insights into how digital marketing strategies can be integrated into entrepreneurship education to enhance effectiveness. This study aims to create a more comprehensive and practical entrepreneurship curriculum by bridging the gap between traditional entrepreneurship education and digital advancements.

In summary, entrepreneurship education has the potential to foster achievement motivation and entrepreneurial interest, yet its impact varies across contexts. The low self-efficacy and entrepreneurial intentions among physical education students highlight the need for a new approach. By adopting digital marketing-based entrepreneurship education, this study aims to provide a viable solution to improve entrepreneurial outcomes among students in this field. Digital marketing offers practical, cost-effective, and scalable business solutions that students can implement regardless of their background. Therefore, the research hypothesizes the following:

H1: Entrepreneurial intentions positively influence students' perceptions of digital marketing-based entrepreneurial learning.

H2: Entrepreneurial self-efficacy positively influences students' perceptions of digital marketing-based entrepreneurial learning.

These hypotheses align with prior findings that entrepreneurial perceptions are often shaped by prior motivation and confidence rather than solely by educational interventions (Longva & Foss, 2018). By testing this model, this study challenges the traditional assumption that education directly influences entrepreneurial intent and self-efficacy and instead considers the reciprocal relationship between these factors. By examining these hypotheses, this research contributes to a more comprehensive understanding of how digital marketing strategies can be effectively integrated into entrepreneurship education. Ultimately, this study not only informs curriculum improvements but also provides a framework for how digital marketing-based entrepreneurship education can be optimized for non-business students, ensuring its relevance and impact across diverse educational backgrounds.

Method

Research Design

This study employs a quantitative survey research design to analyze the impact of perceptions of digital marketing-based entrepreneurship learning on entrepreneurial intentions and self-efficacy among physical education students. A cross-sectional approach was used, collecting data at a single point in time through a structured questionnaire. Proportional startifed random sampling was applied to ensure a representative distribution of participants across demographic categories.

Participants

The sample of this study consisted of 87 physical education students selected from a total population of 849 students. The sample size was determined using Slovin's formula, ensuring a confidence level of 95% and a margin of error of 10%. A proportional stratified random sampling technique was used to ensure that the sample accurately represented different demographic categories, including gender, semester, and specialization. The selection process involved listing all eligible students and randomly selecting participants from each stratum proportionally. The final sample included students from semesters 5 and 6, distributed across five different majors: Games and Sports, Development Activity, Gymnastics, Rhythmic, and Water Activities

Research Instrument

The research instrument consisted of a structured questionnaire adapted from established measurement scales. Student perceptions of digital marketing-based entrepreneurship learning were assessed using Misu et al. (2021), covering career orientation, education methods, leadership, and teacher performance (12 items). Entrepreneurial intention was measured using Liñán & Chen (2009), including personal attitude, subjective norms, perceived behavioral control, and entrepreneurial intention (20 items). Following Ausat & Suherlan (2021), entrepreneurial self-efficacy was measured, covering product development, problem-solving, human resources, strategic planning, innovation, and investor relations (33 items).

Table 1. Dimensions of Research Variables

Variable	Dimension	Items	Total
Student Perceptions (Misu et al., 2021)	Career orientation	3	12
	Formal and non-formal education methods	3	
	Leadership	3	
	Teacher performance	3	
Entrepreneurial Intention (Liñán & Chen, 2009)	Personal Attitude	5	20
	Subjective Norm	3	
	Perceive Behavior Contro	6	
	Entrepreneurial Intention	6	
Entrepreneurial efficacy (Ausat & Suherlan, 2021)	Development of new products and market opportunities	8	33
	Resolve unexpected obstacles	6	
	Critical development of human resources	5	
	Defining core objectives	6	
	Innovative environmental development	5	
	Establish investor relations	3	

Validity and Reliability

Instrument validity was evaluated through expert judgment from three academic professionals in entrepreneurship and educational psychology. The evaluation process involved multiple rounds of expert review, where criteria such as content relevance, clarity, and comprehensiveness were assessed. Any discrepancies were discussed and revised accordingly. Exploratory factor analysis (EFA) confirmed construct validity, ensuring that the questionnaire items aligned with the intended dimensions. Additionally, Cronbach's Alpha values for internal consistency were recorded as follows: 0.87 for Student Perceptions, 0.89 for Entrepreneurial Intention, and 0.91 for Entrepreneurial Self-Efficacy, indicating high reliability.

Data Collection and Analysis

Data was collected through a combination of online and offline surveys. The online survey was distributed via institutional email and academic communication platforms, whereas the offline survey was administered in classroom settings during scheduled lecture hours to ensure a high response rate. Participants were given detailed instructions before completing the survey. The data collection process lasted for four weeks, ensuring sufficient participation from students across different categories. The response rate was 92%, with only a few students opting out due to scheduling conflicts.

Ethical Considerations

The study obtained ethical approval from the institutional ethics committee before data collection commenced. Informed consent was secured from all participants, outlining the purpose of the study, the voluntary nature of participation, and assurances regarding confidentiality. Participants were anonymized through unique identification codes, ensuring their responses remained confidential. Data was securely stored in an encrypted database accessible only to the research team, minimizing risks related to privacy breaches. Any sensitive information was handled in compliance with institutional and ethical guidelines for research involving human subjects.

Data Analysis

Data analysis was carried out systematically in the following steps:

1. Reliability and Validity Testing:

Convergent Validity: Assessed using Average Variance Extracted (AVE), ensuring values exceeded 0.50.

Discriminant Validity: Evaluated using the Fornell-Larcker Criterion to confirm construct distinctiveness.

Internal Consistency: Measured using Cronbach's Alpha and Composite Reliability (CR), ensuring values exceeded 0.70.

2. Model Fit Assessment:

Root Mean Square Residual (RMSR) and Normed Fit Index (NFI) were examined to determine the overall model fit.

RMS Theta was used to evaluate model adequacy.

3. Structural Equation Modeling (SEM) Analysis:

Variance Inflation Factor (VIF) was analyzed to detect multicollinearity.

Effect Size (F^2) was calculated to measure the magnitude of relationships.

R-Square (R^2) values were examined to assess the explanatory power of independent variables.

4. Hypothesis Testing:

Path analysis was conducted to test relationships between constructs.

T-statistics and P-values were used to determine statistical significance ($P < 0.05$).

All statistical analyses were performed using SPSS 25 and SMART PLS 4, ensuring a rigorous evaluation of the proposed research model. Data was collected through online and offline surveys with prior ethical approval and informed consent.

Results

The findings of this study are presented in several stages, beginning with descriptive statistics to provide a general overview of the participants' responses across key variables. This is followed by an evaluation of the measurement model to ensure the validity and reliability of the constructs used. Subsequently, the structural model is analyzed to assess the hypothesized relationships, including an examination of the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and model fit indices. These stages collectively offer a comprehensive understanding of how entrepreneurial self-efficacy and intention relate to the perception of digital marketing-based entrepreneurship learning among physical education students. All statistical analyses were conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with SmartPLS version 4.

Table 1. Descriptive Statistics

Variable	Mean	SD	Skewness	Kurtosis
Student Perceptions	4.12	0.65	-0.31	-0.45
Entrepreneurial Intention	4.05	0.72	-0.28	-0.35

Entrepreneurial Efficacy	4.20	0.68	-0.40	-0.50

Table 1 provides descriptive statistics for each construct. The values indicate that the distribution of responses is approximately normal, with all skewness and kurtosis values within acceptable thresholds (±2), supporting the robustness of further analysis

Reliability and Validity Analysis

The level of reliability of a measurement model (external) is based on the Composite Reliability (CR) value and the Cronbach's alpha value obtained. If the CR value is greater than or equal to 0.06-0.70 with a Cronbach's alpha value greater than 0.60, then a measurement model is said to be reliable. Meanwhile, a measurement model (Outer) is valid if the outer loading indicator value is greater than the cross-loading value of another construct. The Fornell-Larcker criterion compares roots. AVE squared with its latency in building correlation, where the value of the square root of AVE obtained has a value greater than the correlation between latent constructs or discriminant validation. Apart from that, the average variance extraction (AVE) value must also have a value greater than 0.5 with an indicator value of outer loading greater than 0.708 as convergent validity. The following are the results of the analysis of the measurement model in this research.

Table 3. Convergent Validity Measurement Results

Variable	Total Item	Cronbach's Alpha	Composite Reliability	AVE
Student Perceptions	4	0,875	0,915	0,728
Entrepreneurial Intention	4	0.871	0,882	0,653
Entrepreneurial Efficacy	6	0,931	0,945	0,743

Convergent validity testing can be based on values obtained from external loading factors and Average Variance Extracted (AVE). The factor loading limit used in this study was 0.70. Table 3 shows the convergent validity values; student perceptions and self-efficacy have a high level of validity (AVE > 0.70), business intentions have a moderate level of validity (AVE > 0.50), and Cronbach's alpha value is more significant than 0.7 (reliable).

To ensure that each construct is distinct, discriminant validity was assessed using the Fornell-Larcker Criterion. According to this criterion, the square root of AVE for each construct should be greater than its correlation with other constructs. Table 3 presents the discriminant validity results.

Table 4. Loading Factors

Variable	Entrepreneurial Efficacy	Entrepreneurial Intention	Student Perceptions
X1			0,809
X2			0,855
X3			0,840
X4			0,907
Y1.1		0,791	
Y1.2		0,847	
Y1.3		0,860	
Y1.4		0,824	
Y2.1	0,871		
Y2.2	0,864		
Y2.3	0,912		
Y2.4	0,851		
Y2.5	0,825		
Y2.6	0,846		

Tables 3 and 4 show that the lower-order construct internal consistency (Composite Reliability) is all above 0.7, and Cronbach's Alpha value is more significant than 0.60. This shows that the model is reliable.

Discriminant Validity

To ensure that each construct is distinct, discriminant validity was assessed using the Fornell-Larcker Criterion. According to this criterion, the square root of AVE for each construct should be greater than its correlation with other constructs. Table 4 presents the discriminant validity results. The results confirm that all constructs exhibit good discriminant validity, as the square root of AVE values are higher

than the correlation values between constructs. Each construct measures a unique concept, avoiding redundancy or overlap.

Table 5. Fornell-Lecker Criterion Test

Variable	Entrepreneurial Efficacy	Entrepreneurial Intention	Student Perceptions
Entrepreneurial Efficacy	0,862		
Entrepreneurial Intention	0,651	0,808	
Student Perceptions	0,734	0,620	0,853

As for the validity of the model, from Table 5 of the Fornell-Larcker Criterion Test, it can be seen that the square root of the AVE all variables have a value greater than the correlation between latent constructs (discriminant validity) and the AVE value as the average value of the variation in the extracted values has a value greater than 0.708. Thus, based on the values obtained in this research, it can be interpreted that the model has good validity

Model Fit Evaluation

To test model fit using the Standard Root Mean Square Residual (RMSR), Normed Fit Index (NFI), and The Root Mean Squares Residual Covariance Matrix Of The Outer Model Residual (RMS Theta). The results of model fit testing can be seen in the following table:

Table 6. Model Fit

Model Fit	Actual Value
SRMR (Standardized Root Mean Square Residual)	0.076
NFI (Normed Fit Index)	0.873
RMS Theta	0.018

Table 6 shows the The SRMR value of 0.076 is less than the 0.10 threshold, indicating a good model fit. The NFI value of 0.873 is within the acceptable range (above 0.8), representing a marginal fit, and the RMS Theta value of 0.018 is significantly lower than the recommended maximum of 0.102, further confirming model adequacy.

Structural Model Assessment

For Inner Models that show loading levels, weights and path coefficients that have significance are resolved using the bootstrapping method. Figure 1 below shows the measurement model applied in this research.

Figure 1. Measurement Model
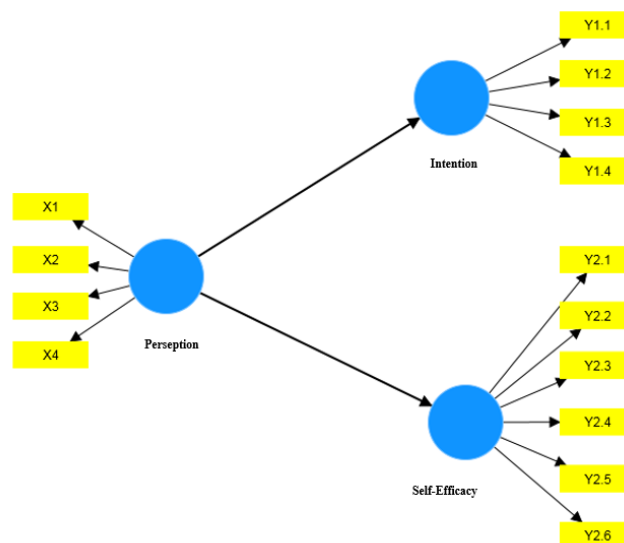
The structural model used in this research shows the causal relationship between the constructs in the model used. The structural model analysis starts from the measurement of the Variance Inflation Factor (VIF), R-square, F-square, and Path Coefficient.

Table 7. VIF, Effect Size (F²) dan Determination of Coefficient (R²)

Variable	VIF	F square	R^2	Q square
Entrepreneurial Efficacy	1,000	0,623	0,384	0,341
Entrepreneurial Intention	1,000	1,166	0,538	0,432
Student Perceptions				

Table 7 shows the collinearity evaluated using the VIF value. Before hypothesis testing, collinearity testing must be carried out to ensure that multicollinearity does not occur in the model. To determine if the model does not have multicollinearity, it can be seen from the existing VIF value, which has a value smaller than 5. namely 1.000. The effect size (F²) shows that the F² value for entrepreneurial intentions in the small effect size category is 0.623, respectively, while for the self-efficacy variable, it is 0.166, which is included in the medium effect size category. T he R^2 value for entrepreneurial intention is 0.384, which indicates that student perceptions explain 38.4% of the variance in entrepreneurial intention, categorized as moderate explanatory power. Meanwhile, the R^2 for entrepreneurial efficacy is 0.538, reflecting substantial explanatory power. The Q^2 values of 0.341 and 0.432 for intention and efficacy, respectively, are above 0, indicating that the model has predictive relevance for these constructs.

Hypothesis Testing

Path analysis was used to measure the direct and indirect impact of the two variables measured (perceptions of digital marketing-based entrepreneurial learning) on entrepreneurial intentions and efficacy. This path analysis can determine whether the research hypothesis is accepted or rejected based on the existing t and P values. The research hypothesis can be accepted if the statistical t value is > 1.667 and P < 0.05.

Based on Table 6, it can be seen that the R square of the entrepreneurial intention variable is 0.384, which shows that student perceptions of digital marketing-based entrepreneurial learning explain 38.4% of the variance in entrepreneurial intention, while the entrepreneurial intention variable is 0.538, which shows that student perceptions explain 53.8% of the variance in entrepreneurial efficacy.

Table 8. Path Analysis Results

Variable	Original sample	T statistik	P value
Student Perceptions → Entrepreneurial Intention	0,620	8,917	0,000
Student Perceptions → Entrepreneurial Efficacy	0,734	15,306	0,000

Table 8 shows that the statistical t-value of students' perceptions of entrepreneurial intentions is 8.917, and students' perceptions of efficacy are 2.538, with a P value of 0.000. This means this research hypothesis is accepted because it has a statistical t value > 1.667 and P < 0.05. This means that the entrepreneurial intention variable positively and significantly affects the perception of digital marketing-based entrepreneurial learning. Likewise, the efficacy variable positively and substantially affects perceptions of digital marketing-based entrepreneurship learning.

Discussion

The findings of this study indicate that students' perceptions of digital marketing-based entrepreneurship learning significantly influence their entrepreneurial intention (β = 0.620, p < 0.05) and entrepreneurial self-efficacy (β = 0.734, p < 0.05). This indicates that students who perceive digital marketing as a relevant component of entrepreneurship education tend to have stronger entrepreneurial intentions and greater confidence in their business abilities. However, it is important to note that this study's correlational design does not permit causal or comparative claims between different types of entrepreneurship education.

These results support previous research highlighting the role of technology-based learning approaches in developing entrepreneurial competencies (Blankesteijn et al., 2024; Iqbal et al., 2022). From an educational perspective, these results support the argument that integrating practical, technology-based learning approaches can enhance students' entrepreneurial mindset (Ntasis et al., 2021). While prior studies have focused on traditional business curricula, the findings of this study are particularly relevant in the Indonesian context, where digital entrepreneurship is rapidly growing, but digital strategies remain underrepresented in educational programs (Cuomo et al., 2021). The strong influence of perception on self-efficacy aligns with Bandura's theory, emphasizing the central role of experiential learning in enhancing entrepreneurial confidence (Ghouse et al., 2024).

The results of this study align with previous findings demonstrating the impact of entrepreneurship education on students' business aspirations (Soomro & Shah, 2022). However, while prior research has predominantly focused on general entrepreneurship education (Yousaf et al., 2020), this study highlights the specific role of digital marketing as a driver of entrepreneurial intention and self-efficacy. This distinction is crucial as digital tools increasingly define modern business practices (Hernández-Sánchez et al., 2020). Nevertheless, some studies have suggested that entrepreneurship education alone does not always lead to increased business creation rates (Amalia & von Korflesch, 2021). In contrast, our findings indicate that when entrepreneurship education incorporates digital marketing skills, it has a more significant effect on students' entrepreneurial self-efficacy and intention. This supports the notion that digitalization enhances entrepreneurial learning by providing real-world, scalable business applications (Kolarov & Hadjitchoneva, 2023).

Furthermore, the results reinforce the Theory of Planned Behavior (TPB) by demonstrating that perceived behavioral control—operationalized through self-efficacy—plays a critical role in shaping entrepreneurial intentions (Azizah, 2023). In addition, the findings align with Social Cognitive Theory (SCT), which stresses the importance of self-belief in driving behavior (Shetty et al., 2023). This study advances these theoretical frameworks by showing that perceptions of digital marketing education may serve as key motivational drivers that strengthen both intention and self-efficacy. In doing so, the research contributes to a more integrative application of TPB and SCT in the context of digital entrepreneurship learning, particularly among non-business students

The results also align with the Entrepreneurial Event Model (Audretsch & Belitski, 2022) by demonstrating that exposure to digital business strategies acts as a triggering event that fosters entrepreneurial action. This suggests that entrepreneurial education should focus on motivation and provide hands-on digital tools to reinforce students' perceived feasibility of starting a business. While the findings strongly indicate a positive relationship between digital marketing-based entrepreneurship learning and entrepreneurial outcomes, alternative explanations should be considered. Students with pre-existing entrepreneurial interests may be more likely to engage with digital marketing tools, leading to a self-selection bias. However, caution must be exercised, as students who already possess a high level of entrepreneurial interest may self-select into or respond more positively to digital entrepreneurship education. Moreover, external factors such as institutional support or macroeconomic conditions could influence students' entrepreneurial readiness (Kryeziu et al., 2024).

Despite its contributions, this study has several limitations. First, its cross-sectional design restricts causal inference. Future longitudinal research is needed to examine how students' perceptions develop over time and whether they translate into actual business creation. Second, while the focus on physical education students offers a unique perspective, it may limit the generalizability of the results to other disciplines. Third, the reliance on self-reported data introduces the potential for response bias.

The findings of this study have significant implications for entrepreneurship education programs. Based on the results, the following recommendations are proposed:

Table 9. Recommendations for Entrepreneurship Education Programs

No.	Recommendation	Description	Source
1	Integrate Digital Marketing Training	Entrepreneurship curricula should include hands-on digital marketing modules to equip students with relevant business competencies.	(Edmondson & Matthews, 2021)
2	Enhance Experiential Learning	Practical learning methods such as business simulations, case studies, and industry collaboration should be emphasized to boost entrepreneurial efficacy.	(Motillon-Toudic et al., 2022)

3	Provide Institutional Support for Digital Startups	Universities should offer incubators and funding programs to facilitate students' digital ventures and strengthen their entrepreneurial commitment.	(Hassan, 2024)
4	Expand Target Audience	Digital entrepreneurship education should be extended beyond business students to include those in physical education, sciences, and the humanities, as supported by the specific findings of this study.	Based on this study's results

These recommendations are directly informed by the empirical outcomes, especially regarding the importance of student perceptions toward digital marketing education. Therefore, this study provides actionable guidance for curriculum development and higher education policies that aim to cultivate entrepreneurial readiness across diverse academic backgrounds.

Conclusions

This study concludes that digital marketing-based entrepreneurship education is positively associated with both entrepreneurial intention and self-efficacy among students. The analysis supports both tested hypotheses: students with higher perceptions of digital marketing-based learning tend to exhibit stronger entrepreneurial intentions (H1) and greater entrepreneurial self-efficacy (H2). While the findings suggest meaningful relationships, the correlational design of the study does not permit causal claims. Nonetheless, the results offer valuable insights into how digital skills and marketing strategies are perceived to support entrepreneurial development. The implications of these findings are particularly relevant for physical education students, who typically have limited access to entrepreneurship curricula. Integrating digital marketing into their educational experience may offer these students alternative avenues for income generation, such as online coaching, fitness content creation, and sports merchandise business. From an educational perspective, this research highlights the need for curriculum designers in physical education programs to incorporate entrepreneurial learning experiences that are interdisciplinary, digital, and practical in nature. This not only addresses the growing demand for tech-savvy entrepreneurs but also advocates for more inclusive and adaptive curricula—particularly within non-business fields such as physical education. While this study contributes to the understanding of digital marketing's role in entrepreneurship education, limitations such as the cross-sectional design and the specific focus on physical education students should be considered. Future research is encouraged to explore these relationships in diverse student populations and through longitudinal designs to examine long-term impacts.

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References

Almonacid Hurtado, J. G., Páez Herrera, J., Muñoz Arias, I., Oyarce Salinas, C., Cerda Covarrubias, M., Walton González, M., & Lasnibat Gallardo, N. (2023). The perception of teaching self-efficacy in Chilean physical education teachers inserted in the school education field. Retos, 48, 564–574. https://recyt.fecyt.es/index.php/retos/index

Álvarez, C. S., & Zúñiga, G. B. (2022). Impact of entrepreneurial training on entrepreneurial intentions: A cognitive approach. Contaduria y Administracion, 67(4), 1–27. https://doi.org/10.22201/fca.24488410e.2022.3269

Amalia, R. T., & von Korflesch, H. F. O. (2021). Entrepreneurship education in Indonesian higher education: mapping literature from the Country's perspective. Entrepreneurship Education, 4(3), 291–333. https://doi.org/10.1007/s41959-021-00053-9

Audretsch, D. B., & Belitski, M. (2022). A strategic alignment framework for the entrepreneurial university. Industry and Innovation, 29(2), 285–309. https://doi.org/10.1080/13662716.2021.1941799

Ausat, A. M. A., & Suherlan, S. (2021). Obstacles and Solutions of MSMEs in Electronic Commerce during Covid-19 Pandemic: Evidence from Indonesia. BASKARA: Journal of Business and Entrepreneurship, 4(1), 11–19. https://doi.org/https://doi.org/10.54268/BASKARA.4.1.11-19

Azizah, M. N. (2023). Relevansi Teori Behaviorisme Menurut Edward Lee Thorndike Dan J.B Watson Terhadap Pendidikan Agama Islam. Educatia : Jurnal Pendidikan Dan Agama Islam, 13(2), 341–358. https://doi.org/10.69879/mczmkj50

Baluku, M. M., Matagi, L., & Otto, K. (2020). Exploring the Link Between Mentoring and Intangible Outcomes of Entrepreneurship: The Mediating Role of Self-Efficacy and Moderating Effects of Gender. Frontiers in Psychology, 11(July), 1–20. https://doi.org/10.3389/fpsyg.2020.01556

Blankesteijn, M. L., Houtkamp, J., & Bossink, B. (2024). Towards transformative experiential learning in science- and technology-based entrepreneurship education for sustainable technological innovation. Journal of Innovation and Knowledge, 9(3), 1–17. https://doi.org/10.1016/j.jik.2024.100544

Caliendo, M., Kritikos, A. S., Rodríguez, D., & Stier, C. (2023). Self-efficacy and entrepreneurial performance of start-ups. Small Business Economics, 61(3), 1027–1051. https://doi.org/10.1007/s11187-022-00728-0

Cuomo, M. T., Tortora, D., Foroudi, P., Giordano, A., Festa, G., & Metallo, G. (2021). Digital transformation and tourist experience co-design: Big social data for planning cultural tourism. Technological Forecasting and Social Change, 162(June), 1–9. https://doi.org/10.1016/j.techfore.2020.120345

Edmondson, D., & Matthews, L. (2021). Developing marketing curriculum to make students workforce ready. International Journal of Educational Management, 35(5), 969–983. https://doi.org/10.1108/IJEM-10-2019-0370

Estelami, H. (2020). The effects of need for cognition, gender, risk preferences and marketing education on entrepreneurial intentions. Journal of Research in Marketing and Entrepreneurship, 22(1), 93–109. https://doi.org/10.1108/JRME-04-2018-0023

Fathoni, F. A., Adi, S., Yunus, M., & Puri, S. C. (2024). Leveraging Digitalization for Enhanced Publication and Marketing of Sports Services Aprovechar la digitalización para mejorar la publicación y el marketing de servicios deportivos. Retos, 57, 264–270. https://recyt.fecyt.es/index.php/retos/index

Ghouse, S. M., Barber, D., & Alipour, K. (2024). Shaping the future Entrepreneurs: Influence of human capital and self-efficacy on entrepreneurial intentions of rural students. International Journal of Management Education, 22(3), 1–14. https://doi.org/10.1016/j.ijme.2024.101035

Hassan, N. A. (2024). University business incubators as a tool for accelerating entrepreneurship: theoretical perspective. Review of Economics and Political Science, 9(5), 434–453. https://doi.org/10.1108/reps-10-2019-0142

Hastuti, T. A., Purwanto, S., Gani, I., Kaloka, P. T., & Tanimoto, H. (2024). Self efficacy analysis of Yogyakarta middle school extracurricular martial arts trainers: gender and coaching. Retos, 58, 592–597. https://recyt.fecyt.es/index.php/retos/index

Hernández-Sánchez, B. R., Cardella, G. M., & Sánchez-García, J. C. (2020). Psychological factors that lessen the impact of covid-19 on the self-employment intention of business administration and economics' students from latin america. International Journal of Environmental Research and Public Health, 17(15), 1–22. https://doi.org/10.3390/ijerph17155293

Iqbal, J., Yi, X., Ashraf, M. A., Chen, R., Ning, J., Perveen, S., & Imran, Z. (2022). How curriculum delivery translates into entrepreneurial skills: The mediating role of knowledge of information and communication technology. PLoS ONE, 17(5), 1–20. https://doi.org/10.1371/journal.pone.0265880

Jáki, E., Aranyossy, M., Halmosi, P., & Becsky-Nagy, P. (2023). Comparative analyses of the educational methods in the leading business development masters programmes in Hungary. Society and Economy, 45(1), 8–32. https://doi.org/10.1556/204.2022.00021

Kolarov, K., & Hadjitchoneva, J. (2023). Opportunities and limitations of digital educational tools in shaping entrepreneurial mindset and competences. Digital Age in Semiotics & Communication, 6, 32–56. https://doi.org/10.33919/dasc.23.6.3

Kryeziu, L., Krasniqi, B. A., Bağış, M., Hajrullahu, V., Zhushi, G., Bytyçi, D., & Ismajli, M. (2024). The effects of institutions, firm-level factors and rational decision-making on entrepreneurial behaviors of MSMEs: lessons and opportunities for transition communities. Journal of Enterprising Communities, 18(4), 771–797. https://doi.org/10.1108/JEC-05-2023-0075

Lai, Z., & Yu, L. (2021). Research on Digital Marketing Communication Talent Cultivation in the Era of Artificial Intelligence. Journal of Physics: Conference Series, 1757(1), 1–5. https://doi.org/10.1088/1742-6596/1757/1/012040

Lestari, A. T., Zamzami, I. S., Rihatno, T., Dlis, F., Lobo, J., Bachtiar, & Setiawan, E. (2023). Blended teaching to improve the mood state and motor performance skills of student-athletes in softball: A randomized-controlled trial. Fizjoterapia Polska, 23(3), 96–106. https://doi.org/10.56984/8ZG1433BB

Lim, J. Y., Kim, G. M., & Kim, E. J. (2021). Predictors of entrepreneurial intention of nursing students based on theory of planned behavior. Journal of Multidisciplinary Healthcare, 14, 533–543. https://doi.org/10.2147/JMDH.S288532

Liñán, F., & Chen, Y.-W. (2009). Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions. Entrepreneurship Theory and Practice, 33(3), 593–617. https://doi.org/10.1111/j.1540-6520.2009.00318.x

Lv, Y., Chen, Y., Sha, Y., Wang, J., An, L., Chen, T., Huang, X., Huang, Y., & Huang, L. (2021). How Entrepreneurship Education at Universities Influences Entrepreneurial Intention: Mediating Effect Based on Entrepreneurial Competence. Frontiers in Psychology, 12(July), 1–12. https://doi.org/10.3389/fpsyg.2021.655868

Mastromartino, B. (2024). Human capital development in sport marketing: industry insights. International Journal of Sports Marketing and Sponsorship, 25(3), 620–640. https://doi.org/10.1108/IJSMS-11-2023-0238

Misu, S. I., Triculescu, M., & Petre, A. (2021). Determining Perceived Work Performance and Self-efficacy Among High-school Teachers. Journal of Economics and Management Sciences, 4(2), 15–26. https://doi.org/10.30560/jems.v4n2p15

Mohammed, N. B. (2025). An analytical study of the availability of comprehensive knowledge marketing management in Iraqi sports institutions Un estudio analítico sobre la disponibilidad de una gestión integral del marketing del conocimiento en las instituciones deportivas iraquí. Retos, 63, 990–1002. https://recyt.fecyt.es/index.php/retos/index

Motillon-Toudic, C., Walter, M., Séguin, M., Carrier, J.-D., Berrouiguet, S., & Lemey, C. (2022). Social isolation and suicide risk: Literature review and perspectives. European Psychiatry, 65(1). https://doi.org/10.1192/j.eurpsy.2022.2320

Ntasis, L., Koronios, K., & Pappas, T. (2021). The impact of COVID-19 on the technology sector: The case of TATA Consultancy Services. Strategic Change, 30(2), 137–144. https://doi.org/10.1002/jsc.2397

Ogba, F. N., Ogba, K. T. U., Ugwu, L. E., Emma-Echiegu, N., Eze, A., Agu, S. A., & Aneke, B. A. (2022). Moderating Role of Initiative on the Relationship Between Intrinsic Motivation, and Self-Efficacy on Entrepreneurial Intention. Frontiers in Psychology, 13(October), 1–11. https://doi.org/10.3389/fpsyg.2022.866869

Ramos, F. O., Lopes Cardozo, P., Souza, D. G., & Drews, R. (2024). Análise da produção científica sobre autoeficácia no contexto esportivo: um estudo no cenário brasileiro Analysis of scientific production on self-efficacy in sports context: a study in the Brazilian scenario Análisis de la producción científica sobre aut. Retos, 60, 67–82. https://recyt.fecyt.es/index.php/retos/index

Rohm, A. J., Stefl, M., & Ward, N. (2021). Future Proof and Real-World Ready: The Role of Live Project-Based Learning in Students' Skill Development. Journal of Marketing Education, 43(2), 204–215. https://doi.org/10.1177/02734753211001409

Romero, M. T. O., Garrido Guzmán, M. E., & Vázquez, C. C. (2022). Self-efficacy and resilience: differences between fitness/bodybuilding athletes and non-athletes. Retos, 44, 232–241. https://doi.org/10.47197/RETOS.V44I0.88937

Sadewa, Y. R., Sumaryanto, S., & Sumarjo, S. (2025). Marketing strategies to improve service quality at sports and fitness venues: a systematic review. Retos, 62, 797–801. https://doi.org/10.47197/retos.v62.109886

Sarman, R., Affandi, A., Priadana, S., Djulius, H., Alghifari, E. S., & Setia, B. I. (2025). Business Success in Emerging Markets: Entrepreneurial Motivation and Entrepreneurial Self-Efficacy. Journal of Small Business Strategy, 35(1), 45–57. https://doi.org/10.53703/001c.124013

Seet, P. S., Jogulu, U., Cripps, H., & Nejati, M. (2023). Transforming self-perceived self-employability and entrepreneurship among mothers through mobile digital sharing economy platforms: an exploratory case study. Personnel Review, 52(3), 492–520. https://doi.org/10.1108/PR-04-2019-0217

Setiawan, I., Kurniawan, W. R., & Wijayanti, D. G. S. (2024). Implementation of Online Teacher Professional Development Programs: Physical Education Teacher Perspectives. Retos, 57, 445–454. https://doi.org/10.47197/retos.v57.105406

Shetty, K., Fitzsimmons, J. R., & Anand, A. (2023). Entrepreneurship as a career choice for Emirati women: a social cognitive perspective. Journal of Small Business and Enterprise Development, 30(1), 58–77. https://doi.org/10.1108/JSBED-10-2021-0397

Silveira Pérez, Y., Ramón Sanabria Navarro, J., Guillen Pereira, L., Ramiro Mediavilla Ruiz, H., Patricio Mediavilla Ruiz, C., & Paola Armas Castañeda, N. (2019). Economía circular: un reto para las instituciones deportivas latinoamericanas Circular economy: a challenge for latin american sports institutions. Retos, 44, 309–318. https://recyt.fecyt.es/index.php/retos/index

Sitaridis, I., & Kitsios, F. (2024). Digital entrepreneurship and entrepreneurship education: a review of the literature. International Journal of Entrepreneurial Behaviour and Research, 30(2–3), 277–304. https://doi.org/10.1108/IJEBR-01-2023-0053

Soomro, B. A., & Shah, N. (2022). Entrepreneurship education, entrepreneurial self-efficacy, need for achievement and entrepreneurial intention among commerce students in Pakistan. Education and Training, 64(1), 107–125. https://doi.org/10.1108/ET-01-2021-0023

Suleiman, S. C., & Ahmed, M. (2022). Educational Psychology: Focus on Psychology of Learning and Learning Styles to Enhance Academic Performance of Learners. African Journal of Humanities and Contemporary Education Research, 6(1), 46–60. https://publications.afropolitanjournals.com/index.php/ajhcer/article/view/244

Tauda, M. T., Entrenamiento, E., Alta, I. De, Hiit, I., & Continuo, E. (2025). Efficacy of high-intensity interval training versus moderate continuous training in cardiac rehabilitation: Systematic Review and Meta-analysis. Retos, 63, 433–458. https://recyt.fecyt.es/index.php/retos/index

Vodă, A. I., Covatariu, D., & Ghiuță, O. A. (2019). Student's entrepreneurial intentions: Role of entrepreneurial education and risk taken ability. Environmental Engineering and Management Journal, 18(7), 1527–1534. https://doi.org/10.30638/eemj.2019.143

Yousaf, U., Ali, S. A., Ahmed, M., Usman, B., & Sameer, I. (2020). From entrepreneurial education to entrepreneurial intention: a sequential mediation of self-efficacy and entrepreneurial attitude. International Journal of Innovation Science, 13(3), 364–380. https://doi.org/10.1108/IJIS-09-2020-0133

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