



Rethinking Physical Education as a pathway to sport entrepreneurship and sports industry development

Repensar la Educación Física como vía para el emprendimiento deportivo y el desarrollo de la industria del deporte

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Abstract

Introduction: Physical education plays a fundamental role in sport development, including the sports industry, particularly through the early formation of sports entrepreneurship competencies. Integrating physical education with entrepreneurial learning is therefore essential for strengthening the sports economy

Objectives: This study aims to analyze the integration of physical education and sports entrepreneurship as a strategic framework for sports industry development in Indonesia, focusing on how pedagogical approaches in physical education foster entrepreneurial mindsets and enhance students' capacity to contribute to the sports economy.

Methodology: A mixed-methods approach with an explanatory sequential design was employed. The quantitative phase involved 120 students from ten Indonesian universities, while the qualitative phase included ten key informants comprising lecturers, sports industry practitioners, and student entrepreneurs. Data were collected using a standardized questionnaire (Cronbach's Alpha = 0.879) and in-depth interviews. Quantitative data were analyzed using multiple regression, and qualitative data were examined using Miles and Huberman's interactive model with triangulation.

Results: The findings indicate that integrating physical education and sports entrepreneurship has a positive and significant influence on sports industry development ($R^2 = 0.642$; $F = 58.214$; $p < 0.001$). Sports entrepreneurship showed a stronger contribution ($\beta = 0.489$; $p < 0.001$) than physical education ($\beta = 0.371$; $p < 0.05$). Qualitative results support these findings, showing that project-based learning and entrepreneurial experiences in sports contexts enhance creativity, innovation, and professional readiness.

Conclusions: Integrating entrepreneurial competencies into physical education curricula can enhance graduate competitiveness and support the development of an innovative and sustainable sports industry.

Keywords

Innovation; Physical Education; sports entrepreneurship; sports industry.

Resumen

Introducción: La educación física cumple un papel relevante en el desarrollo del deporte y de la industria deportiva, especialmente a través de la formación temprana de competencias de emprendimiento deportivo. La integración de la educación física con el aprendizaje emprendedor resulta, por tanto, clave para fortalecer la economía del deporte.

Objetivos: Analizar la integración de la educación física y el emprendimiento deportivo como un marco estratégico para el desarrollo de la industria deportiva en Indonesia, poniendo énfasis en el papel de los enfoques pedagógicos para fomentar la mentalidad emprendedora del estudiantado.

Metodología: Se aplicó un enfoque de métodos mixtos con diseño secuencial explicativo. La fase cuantitativa incluyó a 120 estudiantes de diez universidades indonesias y la fase cualitativa a diez informantes clave (docentes, profesionales del sector y estudiantes emprendedores). Los datos se recopilaron mediante un cuestionario estandarizado (Alfa de Cronbach = 0,879) y entrevistas en profundidad. El análisis cuantitativo se realizó mediante regresión múltiple y el cualitativo mediante el modelo interactivo de Miles y Huberman.

Resultados: Los resultados muestran una influencia positiva y significativa de la integración entre educación física y emprendimiento deportivo en el desarrollo de la industria deportiva ($R^2 = 0,642$; $p < 0,001$), siendo el emprendimiento deportivo el factor con mayor contribución. **Conclusiones:** La incorporación de competencias emprendedoras en la educación física puede mejorar la competitividad de los egresados y favorecer una industria deportiva innovadora y sostenible.

Palabras clave

Innovación; Educación Física; emprendimiento deportivo; industria deportiva.

Introduction

Physical education is the pivot for other sports, which can impact other sectors within a nation's national development. One such sector is the sports industry, which can have a significant impact on the broader economy (Wei et al., 2023). This begins with the entrepreneurial process, which is an integral part of the sports industry concept. Indonesia's entrepreneurial landscape, while crucial for economic and social progress, faces challenges such as low overall entrepreneurial activity and high unemployment rates, underscoring the need for improved sports entrepreneurship education (Dadelo, 2020; Tiberius & Weyland, 2023). This imperative is particularly true for students of the physical education study program, who view sports entrepreneurship education as a powerful instrument in reducing unemployment and enhancing professional employability (González-Serrano, Alonso Dos Santos, et al., 2023). In this study, the term physical education (PE) refers specifically to pedagogical and curricular practices within higher education programs that emphasize experiential learning, character development, and applied motor competencies. It does not denote sport performance, elite sport training, or the broader field of sport sciences. The terms “sport” and “sports industry” are used to describe the professional and economic contexts in which entrepreneurial competencies developed through PE may be applied. Furthermore, integrating entrepreneurship concepts into the physical education curriculum can equip future sports professionals with the proactive behavior and risk-taking propensity necessary to identify and exploit new opportunities in the dynamic sports sector.

This integration can enhance the professional training capabilities of sports and broaden students' entrepreneurial horizons (Zhou et al., 2021). This strategic alignment also directly addresses the observed gap in entrepreneurship exposure among students and reduces their concerns about entrepreneurial risks, particularly in the context of economic factors influencing entrepreneurial motivation (Bernate, 2026; Sokolowski, 2019). To address this, curriculum interventions, such as dedicated entrepreneurship courses and workshops, be effective in significantly increasing entrepreneurial intentions, perceived feasibility, and entrepreneurial desire among students of the physical education study program (da Costa & Miragaia, 2024). Educational initiatives such as these are crucial considering that entrepreneurial attitudes, subjective norms, and perceived behavioral control significantly influence post-graduation entrepreneurial intentions of sports majors (Huertas González-Serrano et al., 2020). Additionally, this intervention can foster an entrepreneurial mindset by emphasizing practical entrepreneurship, incorporating real-world case studies, and fostering self-efficacy, which is crucial for translating entrepreneurial attitudes into actionable ventures.

This comprehensive approach not only prepares students for the complexities of the sports industry but also strengthens their motivation and capacity to launch and grow sports-related businesses (Maritz et al., 2022; Zhou et al., 2021). This integration is crucial to improve the employability of future graduates in the sports sector, thereby reducing the high youth unemployment rate in many countries (Howard et al., 2025). Recognizing this, researchers have renewed their interest in the determinants of entrepreneurship, recognizing the growing importance of entrepreneurship as a source of sustainable development (da Costa & Miragaia, 2024). This new focus stems from the understanding that entrepreneurship in the sports industry can drive economic growth, create jobs, and encourage innovation in sports-related products and services (Han & Niu, 2023; Huertas González-Serrano et al., 2020). This perspective is particularly relevant for students of the physical education study program, who often demonstrate a propensity towards entrepreneurship due to the transferable skills acquired through the practice of physical education (Howard et al., 2025). This includes attributes such as perseverance, teamwork, and strategic thinking, which are highly beneficial to entrepreneurial endeavors.

This positive attitude, coupled with perceived behavioral control and subjective norms, forms the core principles of the Theory of Planned Behavior, which is often used to explain entrepreneurial intentions (McSweeney, 2023). In fact, positive attitudes towards entrepreneurship are significantly correlated with entrepreneurial intentions among students of the physical education study program (Hemme et al., 2017). In addition, external factors, including cultural context and educational policies, significantly modulate the development of entrepreneurial intentions, thus requiring a tailored approach based on a country's specific characteristics (Lara-Bocanegra et al., 2022). For example, the impact of perceived behavioral control on entrepreneurial intentions tends to be more pronounced than attitudes in most



countries, where positive attitudes have a greater influence on entrepreneurial intentions. These regional disparities underscore the importance of a deep understanding of cultural and educational contexts when designing interventions aimed at fostering entrepreneurial intentions among students of the physical education study program.

Combining practical business plan development and strategic planning activities can further enhance entrepreneurial intentions, particularly in contexts where perceived behavioral control is a significant driver (Miragaia et al., 2017). In addition, developing an environment that encourages divergent thinking, creativity, and teamwork through methodologies such as visual thinking and real-life case studies can significantly enhance the development of entrepreneurial skills among students of the physical education study program (Porter, 2018). Pedagogical innovations like these are particularly effective in countries with strong individualistic values and a strong entrepreneurial climate, where students are more likely to view entrepreneurial skills as directly related to personal agency and success. This study proposes an integrative conceptual linkage where physical education functions as a pre-entrepreneurial learning environment that cultivates non-cognitive and experiential competencies, which are subsequently activated through sport entrepreneurship education and manifested in sports industry engagement.

Empirical evidence consistently shows that perceived behavioral control, along with personal attitudes and subjective norms, significantly predicts entrepreneurial intentions across diverse student populations, including those in the field of exercise science (Paiva et al., 2023). This suggests that students with a strong internal locus of control, a characteristic often developed through consistent physical activity, are more likely to pursue entrepreneurial ventures because they believed in their ability to influence outcomes (Mashud et al., 2025; Williams & Macdonald, 2015). In addition, individuals with strong self-perceptions of their entrepreneurial skills tend to have positive attitudes toward entrepreneurship and perceive greater support from their immediate environment to pursue such ventures, indicating the mediating role of these skills in shaping entrepreneurial intentions (González-Serrano, Valantine, et al., 2023; Lara-Bocanegra et al., 2022). Therefore, cultivating a positive attitude towards entrepreneurship as a career path is crucial to increasing entrepreneurial intentions among students of the physical education study program. This is an effort to develop the sports industry, which is expected to impact economic growth and public welfare. However, to date, there has been no research on physical education as a first step in developing an entrepreneurial mindset in students and encouraging the development of the sports industry.

A robust framework for evaluating the effectiveness of pedagogical interventions aimed at fostering an entrepreneurial mindset and developing the practical skills necessary for entry into the sports industry (Yan et al., 2023). Specifically, social cognitive theory states that a person's entrepreneurial goals are greatly influenced by the interaction between their cognitive characteristics, such as mentality, and the surrounding environment (Li et al., 2023). This theory highlights the importance of self-efficacy, observational learning, and modeling in developing entrepreneurial intentions. In addition, entrepreneurial inspiration, which is often fostered through exposure to successful ventures and innovative business models, broadens individuals' perceptions of potential opportunities and increases their intention to engage in entrepreneurial activities (Huertas González-Serrano et al., 2020; Li et al., 2023). For example, entrepreneurial self-efficacy, particularly in risk tolerance, is generally positive among college students, although opportunity recognition efficacy tends to be lower. This indicates the need for targeted educational interventions in the physical education curriculum to enhance students' ability to identify viable business opportunities in the sports sector (Ratten, 2017; Zhou et al., 2021). In addition, the environment and education of sports entrepreneurship significantly influence students' motivation and likelihood to pursue entrepreneurship (Chahal et al., 2024). Although sport entrepreneurship education has experienced substantial growth, research analyzing its impact on the entrepreneurial intentions of sport science students remains scarce, highlighting a critical gap in the literature that this study aims to address. Therefore, investigating how specific pedagogical approaches in physical education can enhance entrepreneurial skills and intentions among students is crucial to strengthening the sports industry in Indonesia.

This study specifically aims to bridge this gap by examining the interaction between sport entrepreneurship education, entrepreneurial on physical education, and developmental factors in shaping the entrepreneurial intentions of physical education students, with a particular focus on their application



in the context of the Indonesian sport industry. This includes exploring the role of creativity and entrepreneurial mindset as mediators between educational interventions and entrepreneurial intentions, as well as the broader impact of the social and cultural environment on this relationship (Nguyen, 2020). The direct relationship between sports entrepreneurship education, entrepreneurial mindset, and creativity, especially in the context of students' entrepreneurial intentions, remains an under-researched area.

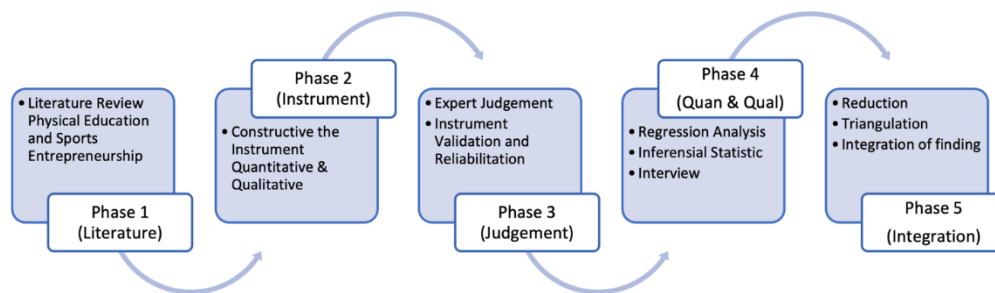
This study contributes to the literature by repositioning physical education not merely as a motor-skill-oriented discipline, but as an early-stage pedagogical mechanism for sports entrepreneurship development. Unlike previous studies focusing on sport management or business programs, this research empirically examines physical education students and curricular practices as the foundational entry point to the sports industry ecosystem, particularly within the under-researched Indonesian context.

Method

Research Design

This study demonstrates the explanatory value of sequential mixed methods in capturing both structural effects and pedagogical mechanisms within physical education contexts (Creswell, 2013). The first stage is quantitative to test the relationship between variables, while the second stage is qualitative, which serves to deepen the meaning of statistical results through in-depth interviews. This approach was chosen because it is appropriate for researching the complex social phenomena of sports education and entrepreneurship, where numerical data needs to be strengthened by a contextual understanding of the field. Therefore, a quantitative approach is used to analyze the relationship between the integration of physical education and sports entrepreneurship on the development of the sports industry, while a qualitative approach is used to deepen the findings through interviews and narrative analysis. The research design scheme is shown in Figure 1.

Figure 1. Explanatory Sequential Research Design Flow



The research was conducted in Physical Education study programs at several universities, focused on sports entrepreneurship development. The study spanned six months, from instrument preparation to data collection to analysis. The mixed methods design enables not only statistical estimation of variable relationships, but also the identification of pedagogical mechanisms through which physical education experiences translate into entrepreneurial competencies.

Participants

The research participants were students of the Physical Education Study Program at 10 state and private universities in Indonesia (Jakarta, Bandung, Yogyakarta, Surabaya, Medan, and Makassar). The identified population was 1,120 final year students. Based on the Slovin formula ($e = 0.05$), a sample of 120 respondents (57 womens, 63 mens) was obtained for the quantitative stage with the age between 20-22 years, and 7 key informants for the qualitative stage who have experiences in sports industry and selected using snowball sampling (2 sports entrepreneurship lecturers who have 7 years experiences to teach sports industry subject, 3 sports industry practitioners who have experience 9 years in sports

industry, and 2 students engaged in sports entrepreneurship who have finished the sports industry subject). The sampling method was purposive sampling with the following criteria: (1) having taken a Sports Entrepreneurship course, (2) having been involved in a campus sports entrepreneurship project or program, (3) Willing to be a research participant. *A post-hoc statistical power analysis was conducted using GPower 3.1* to evaluate the adequacy of the sample size. Assuming a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, and two predictors in the regression model, the minimum required sample size was 68 participants to achieve a statistical power of 0.80. With a final sample of 120 respondents, the achieved power exceeded 0.95, indicating that the study was sufficiently powered to detect meaningful effects. The distribution of the quantitative sample is shown in Table 1.

Table 1. Distribution of Quantitative Samples by University

City	College	Number of Respondents
Jakarta	UNJ & UHAMKA	25
Bandung	UPI	18
Yogyakarta	UNY	15
Surabaya	UNESA	20
Medan	UNIMED	22
Makassar	UNM	20
Total		120

Procedure

There are several research procedure steps carried out in this research, namely:

This in-depth literature review examines the integration of physical education and sports entrepreneurship within the context of the sports industry, focusing on entrepreneurship theory, entrepreneurial competency-based physical education models, and empirical research related to sports management and sports economics. Furthermore, the researcher conducted preliminary observations at several universities to obtain an overview of the implementation of the entrepreneurship curriculum and student fieldwork activities in entrepreneurship.

The instrument development was divided into a quantitative questionnaire (Likert scale 1-5) consisting of 30 questions reflecting the dimensions of physical education, sports entrepreneurship, and sports industry development. The qualitative instrument focused on in-depth interviews to explore perceptions of the integration of physical education and sports entrepreneurship, obstacles and opportunities for industry development, respondents' perspectives, and sports entrepreneurship curriculum strategies.

The instrument trial was conducted in conjunction with expert validation from experts in physical education and curriculum, sports entrepreneurship, and research methodology, resulting in an Aiken's V value of 0.86, indicating excellent content validity. A pilot test on 30 respondents yielded a Cronbach's Alpha score of 0.879, indicating high reliability and adequate construct validity.

Quantitative data collection by conducting online and offline surveys with each respondent filling out a participation agreement (informed consent) form with a filling time of ± 20 minutes. Meanwhile, in qualitative data collection, in-depth interviews were conducted with selected informants. Each interview was then recorded with the informant's permission and transcribed verbatim. The data was then processed and coded to facilitate analysis.

The integration of data collected through triangulation techniques aims to confirm consistent findings, identify aspects not detected by the survey, and provide a comprehensive understanding of the phenomenon of integration of physical education and sport entrepreneurship.

Instrument

Based on the research design using a mixed method approach, the instruments used in this study are divided into:

Questionnaire, used to measure students' perceptions of the integration of physical education and sports entrepreneurship. The scale used was a Likert scale of 1–5. The questionnaire was administered online and offline to students.



Table 2. Operationalization of Research Constructs

Construct	Dimensions	Indicators	Sample Items
Physical Education	Experiential learning, character development, applied motor skills	Project-based sport activities, leadership in sport tasks, responsibility	"Physical education courses provide real-world sport-related tasks relevant to industry practice."
Sport Entrepreneurship	Opportunity recognition, innovation, entrepreneurial intention	Business idea generation, risk-taking, innovation in sport services	"I am able to identify business opportunities in the sport sector."
Sports Industry Development	Employability, service innovation, economic contribution	Job readiness, professional competence, market responsiveness	"Graduates of sport-related programs are increasingly relevant to industry needs."

Validity testing was carried out using Pearson Product-Moment ($r > 0.30$) and reliability testing using Cronbach's Alpha ($\alpha = 0.879$), which showed high reliability. Each construct was operationalized through multidimensional indicators reflecting both educational and industry-oriented perspectives. This operationalization allows the constructs to capture not only theoretical attributes but also applied competencies relevant to sports industry engagement.

Interview Guidelines, used in the qualitative stage to gather in-depth information about the challenges, opportunities, and strategies for integrating physical education and sports entrepreneurship in the development of the sports industry. The interviews conducted were in-depth interviews with key informants.

In addition, we collected data through documentation studies of the curriculum, learning modules, and sports entrepreneurship programs on campus.

Data analysis

Three data analyses depend on the approach method of research.

Quantitative Analysis, namely, quantitative data, was analyzed using validity and reliability tests and classical assumption tests. The questionnaires were then analyzed using multiple regression to examine the statistical relationships between physical education training practices, sports entrepreneurship competencies, and indicators of sports industry development. A partial t-test was also used to further confirm the significance of each predictor variables in influencing the outcome indicators.

Model formula: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \varepsilon$

Qualitative Analysis, namely, Interview data, was analyzed using the Miles and Huberman model, which includes data reduction, data presentation, and concluding/verification. Initial codes were informed by the model's proposed mechanisms (e.g., tactical translation, embodied learning). The analysis then remained open to emergent themes, specifically seeking rich, contextual descriptions of how pedagogical practices, facilitated entrepreneurial learning. This approach ensured findings were grounded in the realities of PE teaching and learning, moving beyond generic entrepreneurial narratives.

Data Triangulation, namely, the results of quantitative and qualitative analysis are combined to produce comprehensive findings regarding the integration of physical education with sports entrepreneurship. Integration occurred at the interpretation stage through joint analysis of statistical outcomes and qualitative themes. Quantitative results identified the relative strength of relationships among variables, while qualitative data explained the pedagogical mechanisms underlying these relationships.

The data analysis results indicate that the research instrument used met validity and reliability requirements. All questionnaire items had item correlation values greater than 0.30, thus being declared valid. Furthermore, the reliability test yielded a Cronbach's Alpha value of 0.879, indicating a high level of internal consistency for the instrument. Therefore, the questionnaire is suitable for use in this study.

Results

The findings of this study show that in the multiple regression test stage, there are two predictor variables, namely Physical Education which includes aspects of curriculum, physical skills, and character values; and Sport Entrepreneurship which includes innovation, creativity, and entrepreneurial motivation.



The outcome indicator is the Development of the Sports Industry which consists of business opportunities, professionalism, and economic contribution.

Table 3. Multiple Regression Results

Model	R	R Square (R2)	Adjusted R2	F-Count	Sig. (p-value)
Multiple Regression	0.801	0.642	0.635	58,214	0.000

The regression analysis revealed a strong statistical association between the integration of physical education training practices and sports entrepreneurship competencies with sports industry development indicators ($R^2 = 0.642$, $F = 58.214$, $p < .001$). Among the predictors, sports entrepreneurship competencies showed a higher standardized coefficient ($\beta = 0.489$, $p < .001$) compared to physical education training indicators ($\beta = 0.371$, $p < .05$). These results indicate differential contributions of the two constructs within the proposed model.

Table 4. Partial Test (t-test)

Variables	Coefficient (β)	T-count	Sig. (p-value)	Note
Physical Education	0.371	4,215	0.000	Significant
Sports Entrepreneurship	0.489	6.103	0.000	Significant

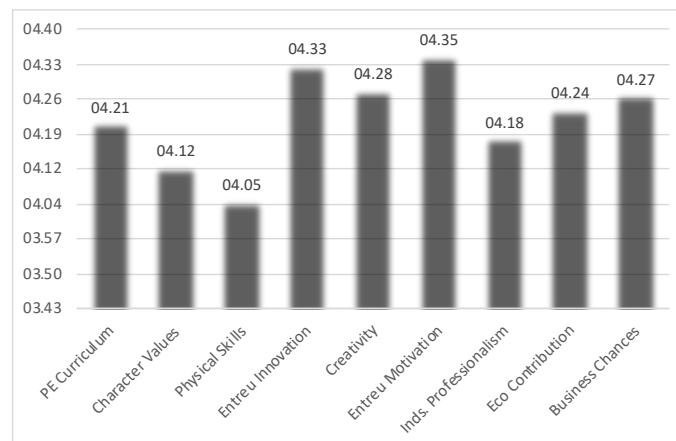
Partially, the Physical Education variable show a strong predictive relationship with the Development of the Sports Industry with a t-value of 4.215 ($p < 0.05$). However, the relationship of the Sport Entrepreneurship variable is more dominant, with a t-value of 6.103 ($p < 0.01$). Then the data shows that the physical education variable has a positive and significant effect on the development of the sports industry with a coefficient of $\beta = 0.371$. The stronger coefficient of sport entrepreneurship ($\beta = 0.489$) suggests that while physical education provides foundational competencies, entrepreneurial activation occurs when these competencies are contextualized through opportunity-driven learning. This indicates a sequential pedagogical mechanism rather than a parallel effect.

Based on the analysis results, the following regression equation was obtained:

$$Y = 0.371X_1 + 0.489X_2 + e$$

This equation confirms that any improvement in both Physical Education and Sports Entrepreneurship will positively contribute to the development of the sports industry, associated with Sports Entrepreneurship being stronger than that of Physical Education. However, the combination of the two yields a strong contribution to the development of the sports industry.

Figure 2. Distribution of Score Average of the Variable



The research then continued with findings obtained during interviews with sports entrepreneurship practitioners, lecturers, and students. Researchers conducted a series of interviews related to the integration of physical education and sports entrepreneurship education within the Indonesian sports industry. The principles and objectives of the sports industry are to support improved public welfare and economic growth. Referring to interviews conducted with sports industry players in the service sector, researchers stated that:

Currently, the sports industry, particularly in the service sector such as fitness centers, personal trainers, and sports training, is shifting toward a community-based approach. We see growing awareness of the importance of a healthy lifestyle as a significant opportunity, directly impacting the sports services sector. However, regulations and systematic support from the government remain suboptimal, resulting in economic growth potential not yet being fully realized. (RO)

A similar sentiment was expressed by the owner of an early childhood physical activity education academy, who said:

The early childhood physical activity education academy sector is currently experiencing rapid growth, as more people are becoming aware of the importance of physical activity for young children. Consequently, the sports industry in the academy service sector is thriving and creating jobs for its trainers. (SS)

Then, according to sports industry players in the manufacturing/goods sector, who revealed that:

From a manufacturing perspective, the sports industry is still in its infancy. Demand for sporting goods has increased, particularly following the pandemic, but it has not yet become a mainstream component of national economic policy. The potential is significant, but the synergy between industry, consumers, and regulations has not yet been fully established. We strive to produce locally produced sports equipment at affordable prices as a contribution to community well-being. (RR)

In addition, the views of students reveal that the relationship between sports entrepreneurship education and learning provides very good benefits, as expressed below:

Sports entrepreneurship learning encourages the emergence of creative ideas, for example, field rental businesses, children's sports academies, personal trainer services, and sales of sports products. (MH)

Another student also expressed his opinion on the benefits of sports entrepreneurship for opportunities in community welfare, stating:

I found it very helpful and felt the benefits directly, because we were taught to practice directly in the community, so that after graduation, I would have an idea of other or additional professions besides focusing on physical education. (SO)

This is supported by the view of a lecturer teaching sports entrepreneurship, who stated:

Integrating entrepreneurship material into physical education practice can be done through field-based projects, such as mini-tournament events or managing sports classes as a "service product." It could also take the form of projects related to providing infrastructure for frequently needed sports in the community. (ST)

Another lecturer also expressed the connection to integrating sports entrepreneurship material:

In developing skills, of course, we cannot focus solely on one field of study. We must also be able to integrate it with other disciplines so that the benefits can be directly felt through mutually positive impacts. Therefore, in the current context, physical education and sports entrepreneurship can be integrated, which will impact the development of the sports industry. (MG)

Based on several findings, both quantitatively and qualitatively, the integration of physical education with sports entrepreneurship has been proven to have a positive and significant impact, especially on sports. Entrepreneurship is the most dominant factor ($\beta=0.489$) in encouraging the development of the sports industry, while physical education plays a role as the foundation of character and basic competencies of students, both academically and practically. Therefore, strengthening the curriculum, supporting facilities, and collaborating with sports industry stakeholders is necessary for optimal results.

Discussion

Using an explanatory sequential mixed-methods design, this study examined how pedagogical experiences within university physical education (PE) programs relate to sport entrepreneurship competencies and to indicators of sports industry development in Indonesia. Quantitatively, the integrated model showed a strong statistical association with the outcome indicators ($R^2 = 0.642$; $F = 58.214$; $p < .001$). Both predictors were significant, with sport entrepreneurship competencies showing a larger standardized coefficient ($\beta = 0.489$; $t = 6.103$; $p < .001$) than PE training indicators ($\beta = 0.371$; $t = 4.215$; $p < .05$). Taken together, these results suggest that, within the study sample, students' perceived entrepreneurial competencies are more strongly related to perceived sports industry development indicators than PE training indicators, while both remain meaningful correlates. This finding is in line with previous research, which emphasizes that physical education not only develops motor skills and physical fitness, but also instills the values of discipline, cooperation, and sportsmanship, which are important provisions in the world of the sports industry (Hasselgård, 2015; Hastie, 2017; Kim et al., 2020). Thus, physical education plays a role as a foundation that prepares human resources with strong character and is ready to adapt to various sports professions. For instance, the stronger effect of sport entrepreneurship on sports industry development ($\beta = 0.489$) was further explained by interview findings highlighting that students perceived entrepreneurial projects and industry-based assignments as critical in translating physical education experiences into market-oriented competencies. This indicates that creativity, innovation, and entrepreneurial motivation in the sports sector are key factors in driving the growth of the sports industry. This finding is in line with global trends that show the rapid growth of the event-based sports industry, facility management, fitness products, and sports tourism (Palos, 2025; Ristiawan et al., 2026). Students who gain entrepreneurial experience through real-life projects in the sports sector have a greater opportunity to create new jobs, while supporting the growth of the national creative economy.

The higher standardized coefficient of sports entrepreneurship competencies ($\beta = 0.489$) compared to physical education training indicators ($\beta = 0.371$) implies that entrepreneurial outcomes are not generated solely through physical education exposure, but through pedagogical processes that explicitly connect physical education experiences with market-oriented thinking. This aligns with the quantitative evidence suggesting that experiential and project-based learning within physical education programs enhances students' readiness to engage with sports-related economic activities. This study confirms that sports entrepreneurship education, especially when combined with creativity and an entrepreneurial mindset, has a positive association with students' entrepreneurial intentions, in line with previous research that highlights the importance of such an integrated approach (Cai et al., 2022; Li et al., 2023). These results underscore the importance of developing an entrepreneurial mindset, which has been shown to enable individuals to effectively internalize acquired knowledge and skills, apply them in practical scenarios, and recognize entrepreneurial opportunities (Hemme et al., 2017). This includes the ability to identify and exploit emerging opportunities in the sports industry, a vital component in driving economic development in Indonesia (Lara-Bocanegra et al., 2022). Specifically, an entrepreneurial mindset encourages a proactive approach to identifying potential business opportunities and results in stronger entrepreneurial intentions, consistent with previous research. The findings should be interpreted within the context of physical education programs in developing sport economies, where formal sport industry pathways are limited. In highly commercialized sport systems, the role of physical education as an entrepreneurial incubator may be less pronounced. Because the review highlighted conceptual overlap, terminology is clarified to support a coherent interpretation. In this manuscript, PE refers to pedagogical and curricular practice in higher education that emphasizes experiential learning, character formation, and applied motor competencies. PE is not treated as interchangeable with sport performance, "physical sport," "physical culture," or the broader field of sport sciences. Sport entrepreneurship is used to describe opportunity recognition, innovation, and the capacity to translate sport-related expertise into viable services or products. Under this framing, the regression coefficients should not be read as evidence that PE causes sports industry growth; rather, PE contributes as an educational environment that can nurture transferable competencies that become economically meaningful when activated through entrepreneurship learning.

Entrepreneurial inspiration significantly increases entrepreneurial intentions, often surpassing the influence of entrepreneurial self-efficacy or creativity (Thuy et al., 2020). This suggests that although personal abilities and innovative thinking are important, the emotional and motivational aspects of inspiration play a stronger role in moving individuals towards entrepreneurial activity (Li et al., 2023). Cultivating entrepreneurial inspiration through educational programs is crucial to fostering a strong entrepreneurial ecosystem within the sports industry, especially in a context like Indonesia, where such development is crucial (Cui et al., 2021). Therefore, curriculum designers and policymakers should prioritize pedagogical methods that actively spark entrepreneurial inspiration among students, particularly through experiential learning and exposure to real-world entrepreneurial challenges (Ramadhan et al., 2022). Such an approach, including case studies and interactions with successful entrepreneurs, can significantly enhance the value and relevance of entrepreneurship education, bridging the gap between theoretical knowledge and practical application (Feng & Chen, 2020; Suriyankietkaew, 2023). In addition, instilling an entrepreneurial mindset, characterized by traits such as innovation, autonomy, and proactivity, significantly develops students' intention to pursue an entrepreneurial career (Singh & Sharma, 2018). This mindset equips individuals with the capacity to identify and exploit opportunities, thereby driving economic growth through the creation of new businesses and the innovation of existing ones (Joddy Andrian Setiawan et al., 2023; Maritz et al., 2022). These entrepreneurial competencies, which include managerial knowledge and problem-solving abilities, are essential for navigating the complexities of the sports industry and driving sustainable growth.

Qualitative findings further clarify this relationship by illustrating how students and practitioners perceive physical education training as a preparatory stage rather than a direct entrepreneurial driver. Interview data revealed that entrepreneurial capacity emerged most clearly when physical education activities were embedded within applied projects such as sport event management, community-based sport services, and small-scale sport enterprises. These findings help explain why sports entrepreneurship competencies exert a stronger association with industry development indicators in the quantitative phase. The holistic development of entrepreneurial competencies is crucial for aspiring sports entrepreneurs, enabling them to innovate and lead in a dynamic market (Promma et al., 2023; Syaekani et al., 2023). Integrating spirituality into entrepreneurship education programs can enhance students' resilience and ethical decision-making, preparing them for the challenges inherent in launching new ventures (Hadi et al., 2022). An integrated approach like this, though often overlooked, can foster a deeper sense of purpose and ethical responsibility among aspiring entrepreneurs (Raible & Williams-Middleton, 2021). This comprehensive approach, which encompasses both practical skills and intrinsic values, prepares students not only to identify and pursue entrepreneurial opportunities but also to contribute positively to community development. Continuous updating and integration of knowledge regarding entrepreneurship education programs and their support systems is essential to understanding their economic and social impacts at the individual, regional, and national levels in Indonesia (Maritz et al., 2022). In addition, focusing on effective teaching methodologies, such as experiential learning and discovery-based learning, can further enhance the development of entrepreneurial abilities, skills, and intentions in students (Saadat et al., 2022; Sofiullah et al., 2023). In this regard, universities should provide adequate resources for such programs, as sports entrepreneurship education has been shown to have a positive impact on students' alertness and mindset, preparing them to seize opportunities even under uncertain conditions.

This educational initiative is crucial to foster self-efficacy and entrepreneurial competencies, which will ultimately result in stronger entrepreneurial intentions among students (Sofiullah et al., 2023). A strong curriculum, emphasizing real-world applications and industry-relevant skills, is essential to equip students with the right attitudes and competencies to launch and manage a successful venture (Okello et al., 2024). Additionally, integrating value-added resources from research into creative formats such as idea competitions or tournaments can further enhance students' competitiveness, which is often a lagging entrepreneurial competency (Promma et al., 2023). Such competitions provide invaluable practical experience in developing and delivering innovative business ideas, thereby strengthening entrepreneurial skills in a dynamic and competitive environment (Cabrera, 2025; Vamplew, 2016). Therefore, strong institutional support and significant funding for research grants in Indonesian universities will play a crucial role in promoting entrepreneurship education and increasing the number of entrepreneurship programs. This support helps foster a vibrant entrepreneurial ecosystem by providing the infrastructure and resources necessary for students to develop their entrepreneurial skills and launch



new ventures (Setiawan et al., 2022). These efforts are crucial considering that sports entrepreneurship education, particularly in Indonesia, is still in its infancy despite its importance being officially recognized over a decade ago (Chang et al., 2024; Maritz et al., 2022). Therefore, strategic investment and sustainable policy implementation are crucial to realize the potential of physical education in developing sports entrepreneurship and, by extension, the sports industry in Indonesia's economic landscape.

The association of entrepreneurship education can be significantly enhanced through comprehensive training, internship opportunities, extensive social networks, and family support, all integrated into the curriculum to produce competitive graduates (Marini et al., 2022; Mei et al., 2020). These educational interventions, often complemented by business simulations and extracurricular activities such as accelerators and incubators, are crucial for cultivating needed entrepreneurial skills and creating an environment that supports innovation (Schimperna et al., 2022). Academic entrepreneurship, particularly in the faculty of sport science, plays a vital role in translating research achievements into practical applications, thereby fostering innovation and entrepreneurial intentions among students (Huertas González-Serrano et al., 2020; Rahimi et al., 2024). This underscores the importance of academics demonstrating strong motivation and willingness to invest in sports startups, as their entrepreneurial spirit directly influences students' intentions and behavior. Continued efforts are needed to ensure the growth and development of these programs, particularly in physical education, to cultivate strong sports entrepreneurs (Williams & Macdonald, 2015). Indeed, bringing successful entrepreneurs from the sports sector into the classroom, forming social media groups with sports entrepreneurs, and creating policies that support entrepreneurs and their visibility on social media are crucial to developing this entrepreneurial pathway (Ratten, 2017). These initiatives not only provide students with direct exposure to industry leaders but also significantly improve their perceptions of the university's behavioral controls and climate towards entrepreneurship (Hindman & Paulsen, 2024). In addition, cultivating entrepreneurial intentions in students of the physical education study program is crucial to enhancing their employability, as these individuals often have a propensity for entrepreneurship due to the transferable skills developed during physical education practice (Miragaia et al., 2017). However, educational policies in sports science faculties must be adapted to each cultural context to successfully foster entrepreneurial intentions. This requires a comprehensive understanding of local economic drivers and cultural nuances to design effective curricula and support systems that align with aspiring sports entrepreneurs. More specifically, policymakers, along with academic institutions, must go beyond mere rhetorical support and provide concrete resources to advance sports science faculties towards third- and fourth-generation universities.

The transformation involves the integration of entrepreneurial orientation, funding, intention, participation, and training within the academic framework, in addition to improving collaboration and communication channels (Purnomo et al., 2024; Rahimi et al., 2024). This integrated approach, which includes internal academic restructuring and external stakeholder engagement, will enable the university to effectively bridge the gap between theoretical knowledge and practical entrepreneurial application in the sports industry (Huertas González-Serrano et al., 2020). Given that students of the physical education study program often exhibit a strong internal locus of control, their entrepreneurial decisions are more influenced by personal factors than by external environmental assessments, highlighting the importance of developing individual capabilities and self-efficacy (González-Serrano, Valantine, et al., 2023). This inherent independence underscores the importance of educational interventions that not only provide theoretical knowledge but also cultivate practical skills such as divergent thinking, creativity, teamwork, and innovative problem-solving through real-world case studies and strategic planning exercises (Lara-Bocanegra et al., 2022). This methodology, particularly effective in countries with individualistic cultures and conducive entrepreneurial climates, can significantly improve students' entrepreneurial perceptions and abilities. Conversely, the gap between academic curricula and the real demands of the sports industry can hinder the development of relevant research and entrepreneurial outcomes (Rahimi et al., 2024). Therefore, continuous refinement of pedagogical approaches and curriculum design is essential to ensure alignment with contemporary industry needs, thereby maximizing the translational impact of academic endeavors.

Taken together, the results suggest that physical education should be conceptualized as a pre-entrepreneurial pedagogical environment rather than a direct determinant of sports industry outcomes. The study does not establish causal relationships, but rather identifies meaningful associations that highlight the importance of curricular integration. This distinction is particularly relevant for physical education



programs in developing sport economies, where structured pathways into the sports industry remain limited. Academic endeavors serve to bridge the gap between universities and the private sector, ensuring that academic programs offer students a deep understanding of the sports industry and its specific customer-centric demands (Yu, 2020). Connective models like these are crucial for equipping students with practical insights into the industry, whether they aspire to launch a start-up or pursue a career in an established sports organization (Sofiullah et al., 2023). In addition, understanding the role of resilience building in an integrated model can contribute to the development of robust entrepreneurial strategies that are able to withstand market disruptions (Hammerschmidt et al., 2024). Given the varying impacts of entrepreneurial stories on business and non-business students, tailored programs are needed to maximize their effectiveness in fostering entrepreneurial intentions (Çelik et al., 2021). In particular, higher education institutions must carefully craft entrepreneurship curricula and pedagogical methods to manage expectations by training students in resilience, recognizing that work-based learning methodologies can bridge the theory-practice gap (Chahal et al., 2024). Furthermore, the effectiveness of sport entrepreneurship education in diverse cultural and geographical contexts requires further investigation, as entrepreneurial innovation and creativity may manifest differently across sport management landscapes. Therefore, interventions designed to increase entrepreneurial intentions should be tailored to students' academic backgrounds to ensure maximum impact and relevance.

The findings have practical implications for curriculum and stakeholder collaboration in PE programs. First, entrepreneurship learning outcomes can be embedded within existing experiential PE modules through project-based assessment. For example, capstone projects can require students to design, implement, and evaluate sport events or community programs using simple business-model tools (value proposition, customer segment, cost structure, and sustainability plan). Second, partnerships with sport industry stakeholders can be strengthened to provide authentic learning contexts, mentoring, and feedback cycles. Such collaboration may also help address the policy and regulatory constraints noted by practitioners by creating clearer pathways for student ventures to transition into formal enterprises or community services. Third, entrepreneurship education should be aligned with local industry segments—service, events, facilities, and manufacturing—so that students learn competencies relevant to realistic opportunities in their regions. Several limitations should be acknowledged. The quantitative data are cross-sectional and based on self-reported perceptions; therefore, regression coefficients represent associations and cannot establish directionality or causality. The outcome construct captures perceived indicators of sports industry development rather than objective market measures. The qualitative phase relied on a small purposive sample of key informants, appropriate for explanatory depth but not for statistical generalization. Despite these limitations, the explanatory sequential design strengthens interpretation by triangulating statistical patterns with stakeholder explanations of pedagogical mechanisms and industry contexts. Future research could adopt longitudinal or quasi-experimental approaches, incorporate objective industry indicators (e.g., venture initiation, revenue, employment creation), and test specific PE-entrepreneurship pedagogical interventions to better understand which training elements most effectively support sport entrepreneurship capacity.

Conclusions

This study rethinks physical education as a strategic pathway for developing sport entrepreneurship and supporting sports industry growth, particularly in the Indonesian context. The findings of the present study indicate that physical education can function beyond its traditional focus on motor skills by fostering entrepreneurial mindsets, experiential learning, and adaptive competencies relevant to the sports economy. When integrated with sports entrepreneurship education, physical education contributes to enhancing students' readiness to engage with industry-oriented opportunities and innovation. However, the results also reveal limited student exposure to digital and online entrepreneurship, underscoring the need for curricular transformation toward technology-driven and digitally mediated sport business models. Embedding digital entrepreneurship, e-commerce strategies and applied technological learning within physical education may broaden graduates' career pathways and address employment constraints commonly faced by physical education alumni. From a scholarly perspective, this study contributes by repositioning physical education as a pre-entrepreneurial learning environment and providing empirical evidence from an under-researched Global South context. Future research



should further explore the strategic practices of sport entrepreneurs, particularly in digital service delivery and technology-enhanced sport education, while expanding simple size and geographic coverage to strengthen generalizability.

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