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## ENHANCING ENTREPRENEURIAL SUSTAINABILITY MINDSET THROUGH SDGS-INTEGRATED COMPETITION-BASED LEARNING: A MIXED-METHODS STUDY ON CURRICULUM AND ENVIRONMENTAL DESIGN

### Introduction

The contemporary business landscape demands entrepreneurs who possess not only traditional business acumen but also a deep understanding of sustainability principles and their practical applications (Rădulescu et al., 2020). As global challenges such as climate change, poverty, and inequality continue to intensify, the role of entrepreneurship education in fostering responsible leadership has become increasingly critical. Universities worldwide are recognizing the imperative to equip future business leaders with the knowledge, skills, and values necessary to address these multifaceted challenges through innovative business solutions.

The integration of the United Nations Sustainable Development Goals (SDGs) into entrepreneurship curricula represents a paradigmatic shift in business education methodology. This approach moves beyond traditional profit-maximization models toward a more holistic understanding of value creation that encompasses economic, social, and environmental dimensions (Amatucci et al., 2013). Educational institutions are increasingly adopting comprehensive strategies that embed sustainability principles across their programs, utilizing diverse pedagogical approaches including case studies, projects, and experiential learning opportunities to develop students' analytical skills and critical thinking capabilities in the context of sustainable business development (Patricia, 2024; Leal Filho et al., 2024).

### The Critical Importance of SDGs in Entrepreneurship Education

Entrepreneurship education (EE) in universities plays a crucial role in promoting sustainable development and addressing global challenges aligned with the SDGs (Patricia, 2024; Dyantyi et al., 2024). By integrating sustainability principles into EE curricula, universities can foster a culture of responsible entrepreneurship, equipping students with the knowledge, skills, and mindset to create innovative solutions for social, environmental, and economic issues (Patricia, 2024; Hansen & Wyman, 2021). Early exposure to sustainability concepts and the SDGs, along with a supportive entrepreneurial ecosystem, is vital in nurturing sustainable entrepreneurs (Hansen & Wyman, 2021). Problem-based learning approaches using real-life challenges can help students develop sustainable business ideas that create value for consumers, enterprises, and communities (Voldsund et al., 2020). This integration of entrepreneurship, innovation, and sustainability in higher education contributes to economic growth, social empowerment, and environmental stewardship, aligning with broader national and global development agendas (Dyantyi et al., 2024; Voldsund et al., 2020).

### Competition-Based Learning as an Effective Pedagogical Tool

Entrepreneurship competitions have emerged as a particularly effective method for implementing experiential learning in university settings, providing students with platforms to participate in the entire process of entrepreneurial activities (Mason & Arshed, 2013; Figueiredo Motta & Galina, 2023). This pedagogical approach offers unique advantages over traditional classroom-based instruction by creating authentic, high-stakes environments that mirror real-world business challenges and decision-making processes. Competition-based learning encourages students to apply theoretical knowledge in practical contexts while developing essential entrepreneurial skills such as opportunity recognition, resource mobilization, and strategic planning (Burguillo, 2010; Joseph & Rahmat, 2018). The competitive format inherently fosters innovation and creative problem-solving by encouraging students to develop unique value propositions and differentiated business models. When combined with SDGs integration, these competitions become powerful vehicles for promoting sustainable entrepreneurship practices. Students are challenged to identify market opportunities that simultaneously address sustainability challenges, leading to the development of businesses that create both economic value and positive social or environmental impact (Daub et al., 2020). This approach aligns with research indicating that innovative entrepreneurship within the SDGs framework offers a basis for empowerment of diverse actors and serves as a facilitator of economic development and poverty alleviation.

### Research Methodology

This study employed a comprehensive mixed-methods research design to evaluate the effectiveness of SDGs-integrated competition-based learning in entrepreneurship education. The methodology combined qualitative analysis of student reflections with quantitative analysis of pre- and post-intervention surveys to provide a holistic understanding of learning outcomes and behavioral changes. The qualitative component involved systematic analysis of student reflection papers, focusing on themes related to sustainability awareness, entrepreneurial mindset development, and practical application of SDGs principles in business contexts.

The quantitative component utilized validated instruments to measure changes in students' knowledge, attitudes, and intended behaviors related to sustainable entrepreneurship. Pre-intervention surveys established baseline measurements of students' understanding of SDGs, entrepreneurial self-efficacy, and sustainability orientation. Post-intervention surveys, administered following participation in SDGs-integrated entrepreneurial competitions, assessed changes in these same variables. This comprehensive approach enabled researchers to triangulate findings and provide robust evidence of the intervention's effectiveness.

### Research Findings

This study's curriculum design findings underscore the effectiveness of integrating SDGs into entrepreneurship education through interactive, project-based approaches. Compared to traditional lectures, courses that combined theoretical foundations with practical applications—such as real-world case studies and SDG-aligned business proposals—significantly enhanced students' sustainability competencies. Key design elements included

interdisciplinary collaboration, industry mentorship, and progressive skill-building tasks. These strategies enabled students to better connect business opportunities with sustainability challenges while global case studies expanded their understanding of SDG relevance across diverse cultural and economic settings, preparing them for socially responsible entrepreneurship in a globalized world.

The analysis of environmental design highlights the critical role of both physical and virtual learning spaces in enhancing SDGs-integrated entrepreneurship education. Collaborative environments—such as innovation labs, maker spaces, and tech incubators—significantly boosted student engagement and enabled the development of more sophisticated business ideas compared to traditional classrooms. Digital platforms further enriched learning by granting access to global sustainability databases, facilitating connections with international peers, and enabling feedback from industry professionals and potential investors. Virtual collaboration tools supported participation in international SDG competitions, broadening students' perspectives on sustainable entrepreneurship. Additionally, access to quiet study areas and independent research resources encouraged deeper reflection, leading to more meaningful integration of sustainability principles into entrepreneurial thinking.

Statistical analysis of pre- and post-intervention survey data confirmed the effectiveness of SDGs-integrated, competition-based learning in enhancing entrepreneurial and sustainability competencies. Students demonstrated a 12.4% average increase in sustainability knowledge, particularly in areas related to analyzing environmental and social issues and supporting sustainable values. Measures of behavioral intention and entrepreneurial alignment with sustainability goals improved by 10.6%, with students showing stronger commitment to integrating sustainability into their future decisions and ventures. These results validate that the challenge-based curriculum significantly strengthens both cognitive understanding and affective motivation toward sustainability-oriented entrepreneurship.

### Conclusion and Implications

This research demonstrates that integrating SDGs into entrepreneurship education through competition-based learning methodologies produces significant positive outcomes for student learning and development. The combination of innovative curriculum design and supportive environmental factors creates a synergistic effect that enhances both entrepreneurial capabilities and sustainability mindset development. Students who participate in SDGs-integrated entrepreneurial competitions develop more sophisticated understanding of how businesses can serve as vehicles for addressing global challenges while maintaining financial viability and competitive advantage.

The findings have important implications for entrepreneurship educators, curriculum designers, and university administrators seeking to prepare students for the evolving demands of 21st-century business environments. The evidence suggests that traditional approaches to entrepreneurship education must be fundamentally reimaged to incorporate sustainability principles and global citizenship concepts. Future research should explore longitudinal outcomes of SDGs-integrated entrepreneurship education, examine cultural variations in program effectiveness, and investigate the scaling potential of competition-based learning approaches across diverse institutional contexts and educational systems.