



Challenges and Implications of Artificial Intelligence in Teaching Entrepreneurship at Universities

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ABSTRACT: Entrepreneurship education aims to identify and validate ideas and business models that have an impact on society. This study analyses the main challenges and implications of integrating Artificial Intelligence (AI) into entrepreneurship education in a university context. Using a qualitative approach based on a literature review, we analyse the pedagogical transformations caused by AI, as well as its impact on the development of entrepreneurial skills. We conclude that, despite the opportunities, it is necessary to ensure a critical and ethical approach to the use of AI, ensuring a balance between technology and humanisation in the process of developing an entrepreneurial mindset.

KEYWORDS: Artificial Intelligence (AI), Entrepreneurship, Teaching, University.

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Introduction

Entrepreneurship education differs significantly from other fields of knowledge due to its experiential, creative, and action-oriented nature. Neck and Greene (2011) argue that entrepreneurship should be taught as a practice, not just a theory. This implies the use of active methodologies, such as project-based learning, business simulations, business games, and mentoring with real entrepreneurs. Rae (2007) reinforces that entrepreneurial education should develop skills such as creativity, leadership, resilience, empathy, and strategic thinking. AI, in this context, can be a valuable tool to support idea prototyping, market analysis, and the simulation of business environments. However, it can also compromise students' spontaneity and autonomy if not used critically.

The methodology adopted is qualitative and exploratory in nature, incorporating a literature review and a focus on key authors.

Theoretical Background

Paschen, Pitt, and Kietzmann (2020) argue that AI can be a powerful ally in generating business ideas and simulating strategic scenarios. The authors argue that by incorporating AI tools into entrepreneurship curricula, universities can provide students with experiences more closely aligned with business reality, promoting data-driven decision-making and rapid experimentation with business models. This approach favours the development of skills such as critical thinking, creativity, and adaptability—essential for the profile of the contemporary entrepreneur.

Fonseca de Almeida (2021), in a study focused on business strategies in Portugal, reinforces the importance of AI as a catalyst for innovation. The author suggests that entrepreneurship education should include technological literacy as a fundamental component, preparing students for a market in which AI is increasingly integral to business creation, management, and scalability. Her research highlights the need for a curricular reformulation that integrates digital and technological competencies across the board.

Henning et al. (2023), in a systematic review of the use of AI in higher education, highlight the role of technology in personalising learning. According to the authors, AI enables the adaptation of content, pace, and methodologies to each student's profile, which can be particularly useful in entrepreneurship education, where learning paths are often non-linear and project-based. This personalisation can foster student empowerment and autonomy in developing innovative solutions.

Duque et al. (2023) explore the application of AI in Brazilian and Portuguese universities, focusing on customisation and predictive performance analysis. The authors argue that AI can be used to create personalised learning paths tailored to students' skills and interests, promoting more effective training that aligns with the challenges of the entrepreneurial ecosystem. Furthermore, they highlight the potential of AI to facilitate project monitoring, automated mentoring, and real-time feedback.

Chui et al. (2018) address AI as a driver of economic transformation, highlighting its cross-cutting impact across various sectors, including education and business. Although the study's focus is not

exclusively on entrepreneurship education, the authors emphasise the urgency of preparing future professionals for a context in which AI redefines the boundaries of innovation, productivity, and competitiveness. In this sense, university entrepreneurship education should incorporate AI not only as a tool but also as an object of critical and strategic reflection.

The literature reviewed suggests a convergence between AI and entrepreneurship education that necessitates a multidisciplinary, ethical, and innovative approach. The authors agree that AI can enrich entrepreneurship education by offering new forms of learning, simulation, and analysis. However, they also warn of the risks associated with technological dependence, the dehumanisation of educational processes, and digital exclusion. Thus, the challenge for universities is to balance the transformative potential of AI with entrepreneurial education that continues to value creativity, empathy, and critical thinking.

Discussion

A literature review reveals that the application of AI in university entrepreneurship education is emerging as a promising trend, but is still marked by structural, ethical, and pedagogical challenges. The selected studies offer different perspectives on how AI can transform entrepreneurial learning, while raising critical questions about its implementation.

Paschen, Pitt, and Kietzmann (2020) highlight the potential of AI to expand access to market knowledge by allowing student entrepreneurs to simulate strategic decisions based on real data. This approach favours experiential learning, where students can test business hypotheses in virtual environments, reducing risks and accelerating the innovation process. However, this reliance on data and algorithms requires robust digital literacy on the part of students and faculty, which is not always guaranteed in university settings.

Henning, Costa, and Ribeiro (2023) reinforce this idea by pointing out that AI can personalise higher education, adapting content and methodologies to each student's profile. In entrepreneurship education, this personalisation can be particularly effective, given the non-linear and practical nature of entrepreneurial learning. However, the authors caution against the risk of these technologies replacing the critical role of the teacher as a mediator and mentor, particularly in courses that necessitate ethical reflection, creativity, and decision-making in complex and ambiguous contexts.

Duque, Silva and Carvalho (2023) provide a comparative perspective between Brazil and Portugal, highlighting that the adoption of AI in universities remains uneven and dependent on institutional and cultural factors. Personalisation of education, while desirable, faces barriers such as a shortage of technological resources, insufficient teacher training, and resistance to change. In entrepreneurship education, these limitations can compromise the effectiveness of AI-based approaches, especially in institutions with less digital infrastructure.

Fonseca de Almeida (2021) offers a business perspective by illustrating how Portuguese companies are utilising AI to innovate and compete. This business reality should be reflected in university education, preparing students to integrate AI into their future entrepreneurial practices. However, the author suggests that there is still a disconnect between what is taught in universities and

market demands, which reinforces the need of update entrepreneurship curricula with technological and analytical skills.

Chui, Manyika and Miremadi (2018) approach AI as a driver of economic transformation, with direct implications for the future of work. This macroeconomic perspective reinforces the idea that entrepreneurship education must prepare students for a constantly evolving ecosystem, where AI is not just a tool, but a force that redefines business models, value chains, and professional profiles. Entrepreneurial training, in this context, must be oriented toward agility, interdisciplinarity, and adaptability. • In summary, the discussion points to a scenario of opportunities and challenges. AI can significantly enrich entrepreneurship education in universities, but its implementation requires a critical, ethical, and strategic approach. Investment is needed in teacher training, curriculum updates, and the creation of learning environments that integrate technology without losing sight of the human values that underpin the entrepreneurial spirit: creativity, empathy, resilience, and vision.

Conclusion

The analysis developed throughout this article allows us to affirm that the integration of AI into university entrepreneurship education represents a promising frontier, but one fraught with complexities that require a critical, ethical, and methodological approach. AI offers valuable resources for personalising learning, simulating business environments, supporting the prototyping of ideas, and expanding access to specialised content. Tools such as intelligent tutors, recommendation algorithms, and predictive analytics systems can significantly contribute to the development of entrepreneurial skills, provided they are aligned with active, student-centred methodologies.

However, the risks associated with technological dependence, the cognitive superficiality induced by generative systems, and the reduction of creative spontaneity cannot be ignored. As Fernandes (2021) warns, "generative AI can lead to the automation of thought, compromising students' intellectual autonomy." This criticism echoes Manrique (2017), who argues that "creativity, as a singular human expression, cannot be fully reproduced by algorithmic systems."

The ethical dimension emerges as central to this debate. Floridi et al. (2018) propose that "explainability, fairness, and accountability should be structuring principles of AI applied to education". This perspective reunderscores the importance of institutional policies that ensure data protection, mitigate algorithmic biases, and promote equity access to technologies.

The mixed-methodological approach presented in this article, combining theoretical review with empirical application, offers ways to validate and deepen the reflections developed here. The research questions formulated enable us to systematically explore the perceptions of faculty and students regarding the impact of AI on entrepreneurial education, as well as identify latent patterns and dimensions using statistical tools.

It is concluded that universities should invest in hybrid pedagogical ecosystems that combine technological innovation with human, reflective, and collaborative practices. As Neck and Greene (2011) argue, "entrepreneurship education must be experiential, centred on action and meaning-making." Training entrepreneurs in the digital age requires more than ;just technical proficiency: it

also demands critical thinking, creativity, social responsibility, and adaptability. AI can be a powerful ally in this process, provided it is integrated with awareness, rigour, and commitment to the educational mission.

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