OPPORTUNITIES AND LIMITATIONS OF DIGITAL EDUCATIONAL TOOLS IN SHAPING ENTREPRENEURIAL MINDSET AND COMPETENCES

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Abstract

This paper examines the potential of digital learning environments in preparing future entrepreneurs through higher education. Despite historic doubts regarding the systematic teaching of entrepreneurial skills, in recent decades entrepreneurship education has distinctly evolved. Unlike conventional professions, entrepreneurship encompasses a diverse array of specific challenges in business creation and management. This makes it challenging to adopt a uniform educational approach. Hence, a blend of appropriate educational methods is essential. These range from inspiring

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learners through entrepreneurial narratives to fostering conceptual and practical skills for recognizing opportunities, validating business ideas, gaining knowledge and skills for managing processes and resources, and cultivating personal attributes crucial for entrepreneurial success.

The paper critically evaluates the potential of digital learning environments in nurturing entrepreneurial competencies. This is achieved by juxtaposing the outcomes of existing theoretical and empirical studies on the utilization of digital tools in entrepreneurship education. The research aims to address crucial questions: what, how, and by whom should entrepreneurship be taught; the distinct advantages and limitations of various digital tools in fostering specific entrepreneurial competencies; and to what extent digital learning environments can enhance the overall effectiveness of entrepreneurship education, considering the extent of resources committed. The array of digital tools encompasses virtual learning environments, interactive communication channels, multimedia products, engaging learning content, and specialized software for practical activities. The research adopts an exploratory methodology, applying qualitative methods. An online questionnaire was conducted to explore the perspectives of current entrepreneurship students in two Bulgarian universities.

The paper concludes that digital learning environments indeed have the potential to significantly enhance the overall effectiveness of entrepreneurship education. However, a discerning approach is essential when selecting the appropriate digital tools tailored to foster distinct entrepreneurial competencies, considering the specific stage of the entrepreneurial learning process. Different digital facilitators demonstrate varying degrees of efficacy in shaping the mindset and competencies of future entrepreneurs in determining entrepreneurial opportunities, cultivating relationships, conceptualizing, organizing, strategizing, and displaying commitment.

Introduction

In recent decades, the training of future entrepreneurs through higher education has become a significant area of research interest. However, dispelling doubts about the ability to acquire the skills necessary for creating and managing business is an insufficient condition for developing effective educational approaches and methods in entrepreneurship education. Unlike other professions with clearly structured knowledge and skills, entrepreneurship manifests itself in an extensive array of specific problems encountered in business creation and management practices. This wide spectrum necessitates the amalgamation of appropriate educational methods. The methods range from engaging learners with inspiring entrepre-

neurial narratives to developing conceptual and practical skills aimed at identifying entrepreneurial opportunities, validating business ideas, acquiring knowledge and skills for managing processes and resources specific to a business, and refining personal traits crucial to entrepreneurial success. In summary, there is a need to tailor educational methods to the set of entrepreneurial competencies which the educational process aims to cultivate. Concurrently, with the evolution of entrepreneurship education, we have observed the development and integration of diverse digital educational tools. These tools offer a range of functionalities and applications, constituting that which is referred to as a digital learning environment. This includes the creation of a virtual learning space, competitive communication channels, multimedia products, interactive learning content, specialized software for experimental activities, and more.

The aim of this paper is to present a critical review of the potential of digital learning environments for the formation (building) of entrepreneurial competences. It seeks to answer key questions: what should be taught, how and by whom; what are the specific advantages and limitations of various digital tools in building specific entrepreneurial competences; and to what extent can digital learning environments contribute to the overall effectiveness of entrepreneurship education, considering the scope and committed resources.

An online survey was conducted using a questionnaire to explore the perceptions of current students studying entrepreneurship at two Bulgarian universities.

The paper is structured as follows: a theoretical section comprising five segments focusing on a review of the literature defining the entrepreneurial mindset; discussing entrepreneurial competencies; exploring entrepreneurial training and education; investigating changing educational approaches and learning methods; and identifying digital technologies integrated into learning. The empirical part covers the data and methodology of the empirical study, followed by the results and discussion, concluding succinctly at the end.

Defining the Entrepreneurial Mindset

An essential concern of entrepreneurship education is the cultivation of an entrepreneurial mindset and competencies. This is related to the growing acknowledgment that possessing these mindsets and competencies is a primary prerequisite for both initiating an entrepreneurial career and achieving success.

Defining the entrepreneurial mindset remains a subject of ongoing debate. As revealed in Naumann's study (2017), scholars predominantly delineate specific attributes of entrepreneurial thinking, categorized into core and meta-cognitive traits. While the core traits are observable through an individual's behaviour, the latter remain implicit. Naumann identifies eight crucial definitions of an entrepreneurial mindset (Table 1).

Table 1. Entrepreneurial mindset definitions

Author	**Definition**
McGrath & MacMillian (2000, p. 15)	"ability to sense, act, and mobilize under uncertain conditions"
Ireland, Hitt, & Sirmon (2001, p. 968)	"way of thinking about business that focuses on and captures benefits of uncertainty" "growth-oriented perspective through which individuals promote flexibility, creativity, continuous innovation, and renewal"
Haynie & Shepherd (2007, p. 9)	"ability to adapt thinking process to a changing context and task demands"
Dhliwayo & Van Vuuren (2007, p. 124)	"way of thinking and acting about business"
Shepherd, Patzelt & Haynie (2010, p. 62)	"ability and willingness of individuals to rapidly sense, act, and mobilize in response to a judgmental decision under uncertainty about a possible opportunity for gain"
Baron (2014, p. 55)	"think, reason, make decisions, plan and set goals in relatively unique way"
Davis, Hall & Mayer (2016, p. 2)	"constellation of motives, skills, and thought processes that distinguish entrepreneurs from non-entrepreneurs"
McMullen & Kier (2016, p. 664)	"ability to identify and exploit opportunities without regard to the resources currently under their control", only working when entrepreneurs experience promotion focus

Source: Naumann (2017).

Naumann (2017) concludes that an entrepreneurial mindset fundamentally embodies "a way of adaptive thinking and decision-making in complex, uncertain, and dynamic environments." He identifies seven attributes which influence the entrepreneurial mindset: (i) five central -cognitive tuning and purposefulness, heuristic-based logic in decision-making, vig-

ilance, prior knowledge, and social interaction; and (ii) two meta-cognitive – metacognition and cognitive adaptability. He emphasizes that the effect of the first five attributes translates into recognizable and observable behaviours, while the latter two, in addition to influencing the first five, facilitate the entrepreneur's learning and adaptation.

Another significant contribution from Naumann's analysis is the correlation of the entrepreneurial mindset with four other entrepreneurship research themes: the integrated approach of entrepreneurial trait theory; resource-based theory; strategic entrepreneurship; and entrepreneurial education. Briefly described, these connections are as follows: (i) personal characteristics significantly influence the entrepreneurial mindset; (ii) the entrepreneurial mindset represents a distinct resource, often referred to as the fourth resource alongside natural resources, labour, and capital; (iii) the entrepreneurial mindset constitutes a vital element in the strategic entrepreneurship model, contributing to the development of a competitive advantage; and (iv) the formation of an entrepreneurial mindset is not only possible but critically important through entrepreneurship education. Despite differences in understanding the nature of the entrepreneurial mindset, a thorough study of its determining factors could significantly advance entrepreneurship education.

One of the latest studies on the entrepreneurial mindset by Daspit et al. (2023), which analyses 61 publications, proposes the following comprehensive definition: the entrepreneurial mindset is a cognitive perspective which empowers an individual to create value by recognizing and acting on opportunities, making decisions with limited information, and remaining adaptable and resilient in conditions often characterized by uncertainty and complexity. This study also examines the determinants of the entrepreneurial mindset and its impact on enterprise success, offering pedagogical insights. The scope of this paper also covers notions linking the entrepreneurial mindset to learning, particularly emphasizing the role of design-thinking in enhancing entrepreneurial thinking, along with the significance of workshops, labs, and modules. Specific pedagogical tools found to influence entrepreneurial thinking include simulations, specialized projects, and online discussions.

Daspit et al. (2023) emphasise the integrated learning approach as a key pedagogical technique for developing an entrepreneurial mindset. This approach synergistically combines passive and active learning through various techniques such as: lectures, learning logs, projects, case studies, brainstorming, prototyping and testing, personal reflections, self-directed assignments, interviews, and ideation exercises.

Towards Entrepreneurial Competences

As a distinct area of knowledge, entrepreneurial competencies emerged after the establishment of the concept of managerial competencies proposed by Boyatzis (1982). According to Boyatzis, competence can encompass any characteristic of an individual, such as: knowledge, motive, personality trait, self-perception, social role, and skill, that he applies in his work. Penchev & Salopaju (2011) conducted an extensive review of the literature on entrepreneurial and managerial competencies. As a result they propose two groups of entrepreneurial competences: (i) core entrepreneurial competencies needed at all times from the start-up (proactiveness, change, risk-taking, recognizing opportunities, flexibility, networking, decision-making, creativity, innovativeness), and (ii) entrepreneurial competencies crucial subsequently in the running of the company (leadership, communication, specialization, problem-solving).

Within the framework of the ENGAGE.EU European University Alliance project, one of the challenges is to synthesize innovation-entrepreneurship (inno-preneurial) competences. During this process, an in-depth review of available typologies was carried out, including those developed and presented by authors such as: Caird (2013), Moberg et al. (2014), Bacigalupo et al. (2016), Nakamoto & Rice (2017), Shaver et al. (2019), and Jung & Lee (2020). A synthesis of this review highlights the consistent presence of the following entrepreneurial competencies in all typologies, albeit under similar names: recognition of opportunities; taking the initiative; coping with uncertainty, ambiguity, and risk; motivation and persistence; self-efficacy and self-confidence; mobilizing others and collaborating; planning and management (execution). The fundamental inno-preneurial competencies are presented at four main levels: personal, functional, actionable, and thinking (Table 2).

Table 2. Inno-preneurial competences

Self	Taking the initiative	Motivation and persistence	Self-efficacy and self-confidence
Function	Creating and recognizing opportunities	Creativity and innovativeness	Decision-making under uncertainty
Action	Collaborating in diverse and interdisciplinary contexts	Mobilizing resources	Implementation
Thinking	System thinking	Future and disruptive thinking	Ethical and sustainable thinking

Source: Authors' elaboration based on the ENGAGE.EU Project.

Moreover, entrepreneurship trainers and practitioners utilize multiple digital-based frameworks, in order to describe and measure entrepreneurial mindset as a cornerstone during entrepreneurship education and its outcomes (Table 3).

Table 3. Digital based frameworks to describe and measure entrepreneurial mindset

Frameworks and Tools	**Source**
GET2 Test – General measure of Enterprising Tendency	http://www.get2test.net/
ASTEE Measurement Tool	Moberg et al. (2014)
Entrepreneurial Mindset Profile (EMP)	https://www.emindsetprofile.com/
EntreComp: The Entrepreneurship Competence Framework	https://ec.europa.eu
Entrepreneurial Mindset Index (EMI)	https://www.nfte.com/
MindCette Entrepreneurial Test (mcetTM)	https://www.mindcette.com/
CS-EMS College Students' Entrepreneurial Mindset Scale	Jung et al. (2020)
bdc Entrepreneurial potential self-assessment	https://www.bdc.ca/en/articles-tools/entrepreneur-toolkit/business-assessments/entrepreneurial-potential-self-assessment
Humanmetrics Entrepreneur Quiz	https://www.humanmetrics.com/entrepreneur
Truity Personality Test	https://www.truity.com/test/300-question-personality-test

Source: Authors' elaboration based on an empirical survey of entrepreneurial education in NBU and UNWE.

Training and Education for Creating Entrepreneurial Competences

Within the European Union countries, building entrepreneurial qualities is a priority in modern higher education. This priority stems from the "Bologna Process" in higher education, which emphasizes the development of entrepreneurial capacity and the entrepreneurial mindset among young Europeans. Entrepreneurship education today encompasses three distinct yet complementary objectives: (i) boosting motivation for entrepreneurial careers among students, (ii) equipping students with the skills to initiate and manage their own businesses, and (iii) fostering entrepreneurial abilities to identify and capitalize on opportunities. The main challenge arising from these objectives is: how can the traditional approaches and methods entrenched in higher education be evolved and customized to effectively achieve these objectives?

The significance of this challenge is rooted in the nature of entrepreneurial activity. It strongly reflects an individual's characteristics, is profoundly influenced by its implementation context, and is action-oriented rather than knowledge-focused. This characteristic presents substantial difficulties in defining a professional framework for training future entrepreneurs. Furthermore, integrating entrepreneurship education into a curricular framework designed for more mature and structured professions amplifies this challenge. In essence, entrepreneurship education faces the challenge of finding a balance between unifying tendencies, aligning various specialties, necessary disciplines, resources, and teachers, while adopting the most effective entrepreneur training methods.

In contrast to many well-established academic disciplines, where the learning process has proven effective, the training of entrepreneurs presents unique challenges. This is mainly due to the greater emphasis on developing personal qualities, when compared to the knowledge required for other professions. It is widely acknowledged that the development of personal qualities cannot be solely attributed to the educational process. It is also a product of the overall environment in which the personality of an individual is formed from early childhood. Education is an essential instrument, albeit one of many, in developing modern entrepreneurial competencies. For example, a literature review by Raposo & Paço (2011) underscores vital links between education, venture creation, entrepreneurial performance, and entrepreneurial activity. They conclude that "education and training should focus more on changing personal attitudes than on knowledge since the effects could be more significant for the business creation process and for overcoming perceived barriers to entrepreneurship".

Markowska (2011) offers an integrative model for entrepreneurial competence development, emphasizing that beliefs contributing to successful entrepreneurial performance are crucial. Entrepreneurs need to become agents of their own development.

Changing Educational Approaches and Learning Methods

After decades of scepticism regarding the possibility of instilling entrepreneurial mindsets and competencies through the formal education system, entrepreneurship disciplines and comprehensive programs are now widespread across all levels of formal education. However, unlike many established academic disciplines, entrepreneurship is still evolving and being continuously enriched by research on various entrepreneurial practice aspects.

A key discourse in this evolution revolves around the ultimate goals of entrepreneurship education. Should the focus be on increasing motivation for choosing an entrepreneurial career, thereby increasing the number of entrepreneurs? Or should the emphasis be on enhancing the quality of entrepreneurial initiatives, measured by increased innovation and higher added value? Both objectives are increasingly emphasized in traditional economic and management education. Given the role of entrepreneurship in addressing a range of societal and economic problems, priority should be given to boosting the number of entrepreneurs among the economically active population. In line with this, researchers like Raposo and Paço (2011) suggest that "education and training should focus more on changing personal attitudes than on knowledge since the effects could be more significant for the business creation process and for overcoming perceived barriers to entrepreneurship".

It is worth noting that three approaches to entrepreneurship education are recognized today (Lackéus 2015): (i) "about" entrepreneurship, which provides a general understanding of the phenomenon and directs students' attention to entrepreneurship as a career choice, (ii) "for" entrepreneurship, which promotes entrepreneurial practices and encourages students to become entrepreneurs, and (iii) "through" entrepreneurship, which introduces experiences aimed at training entrepreneurs. All three types of entrepreneurship education encounter specific methodological challenges regarding the creation of an entrepreneurial mindset. As is evident from various perspectives, an entrepreneurial mindset is not merely about acquiring knowledge but involves providing experiences and exposures akin to real-world situations.

Many educational pedagogues consider that traditional passive learning not only lacks motivational potential (aside from the influence of the teacher's personality) but also does not lead to the meaningful development of new competencies. This is due to its limitations in balancing the four elements in the learning process, as per Kolb's theory (Kolb 1984). Kolb's theory posits that learning occurs in a cycle of four stages: (i) concrete experience, (ii) reflective observation, (iii) abstract conceptualization, and (iv) active experimentation. Furthermore, Kolb's theory distinguishes four learning styles based on how learners acquire and process information. Gemmell (2017), when examining learning styles among entrepreneurs in science-intensive industries, concludes that a preference for learning through active experimentation over reflective observation suggests entrepreneurial innovation behaviour and significant entrepreneurial benefits. Solutions which leverage current technological advancements, especially digital technologies, are being sought, in order to o enhance the learning process by ensuring a balanced and meaningful participation of each of the four elements in Kolb's cycle.

Integrating Digital Technologies into Learning

Over the past nearly 80 years, digital technologies have undergone extensive development. Their widespread applicability has become particularly apparent in the last two decades. In the field of education, their application has led to several educational innovations, including but not limited to: Bring Your Own Device (BYOD), blended learning, flipped learning, and flipped classrooms, as well as online learning. Johnson et al. (2014) categorize emerging digital technologies into seven groups: consumer technologies (e.g., 3D video, mobile apps, telepresence); digital strategies (e.g., BYOD, games and gamification); enabling technologies (e.g., cloud computing, IoTs, real-time translation); internet technologies (e.g., badges and microcredits, learning analytics, virtual and remote labs); learning technologies (e.g., crowdsourcing and crowdfunding, digital identity, social networks); social media technologies (e.g., 3D printing, rapid prototyping, augmented reality); and visualization technologies (e.g., geolocation, machine learning, virtual assistants). Within these categories, there are specific technological solutions relevant to entrepreneurship education, which assist in preparing for, launching, and developing a real business.

Sousa et al. (2017) distinguish digital technologies with direct applicability in learning, which provide technological support for learning methodologies, contexts, tools, simulators, and support systems for digital learning (Table 4).

Table 4. Digital technologies in learning

Digital learning methodologies	**Tools and Simulators**
Project based-learning; problem based-learning; digital stories; online learning environments; digital moments; technology integrated teaching methods; digital storytelling; educational games; authentic learning	Web-based video; computerized environments; spatial science technology; slow-motion: narrated stop-motion animation; generic modelling language; digital video; augmented reality; design-based research; gamification; learning manager; simulation; computer-based teaching; library webinars
Digital learning contexts	**Support Systems for Digital Learning**
Collaborative communities; cooperative learning; digital combinational system; collaborative learning; flipped classroom using digital media; moving from fixing to online space; experiential online development; open educational practice; network participation.	eLearning; mobile learning; learning object repository; blended learning; blackboard; Moodle learning manager; twitter; videoconferencing; MOOCs (massive open online courses)

Source: Authors' elaboration based on Sousa et al. (2017).

Educational technologies, such as social media, serious games, and MOOCs, are increasingly being integrated into entrepreneurship education, presenting both opportunities and limitations. Social media, categorized as social software, is primarily utilized before and after online entrepreneurship education courses for preview and review. Learning platforms and face-to-face (F2F) methods still remain the primary modes of instruction and active learning in entrepreneurship education. Serious games (SGs) contribute to making entrepreneurship education more engaging and attractive when compared to courses without SGs. These games simulate real business scenarios and, based on action orientation, help participants learn entrepreneurial motivation, skills, and knowledge. Nevertheless, research on the benefits and effects of serious games on entrepreneurial competencies and entrepreneurial performance is still in its nascent stage. However, it is worth noting the observations about the challenges found in an empirical study (Fellnhofer 2015): "the use of a serious game in a digital game-based learning environment significantly influences entrepreneurial behavior and intentions when comparing players and non-players. However, the entrepreneurial attitudes toward entrepreneurship and toward entrepreneurship education are not significantly different between playing and not-playing survey participants."

A clear distinction should be maintained: serious games can encompass both traditional board games and digital games that occur entirely in virtual reality. On the other hand, digital educational tools such as MOOCs facilitate the accessibility of entrepreneurship education due to their flexibility in terms of time and distance. They provide a convenient way for students to learn at their own pace. However, they lack F2F interaction, frequent feedback, sufficient support services, and the self-discipline required to complete entrepreneurship courses.

In a follow-up study, Sousa et al. (2019) proposed possible concrete digital solutions for individual tasks arising in the entrepreneurial process, as well as in the training of entrepreneurs and entrepreneurship education of students (Table 5).

Table 5. Digital solutions to individual tasks arising in entrepreneurial process and training

Start-up stages	**E-education methodologies**	**Entrepreneurs and university's students' methodologies identification**
Business plan/ model	Project based-learning; problem based-learning; digital stories; online learning environments; technology integrated teaching methods; digital storytelling; educational games; active learning	Mentoring; Business counselling; Self-directed experienced learning; Education
Choice and structuring of the idea for the enterprise	Collaborative communities; cooperative learning; collaborative learning; network participation	Networking opportunities; Example of success
Pilot project of the entrepreneurial idea	Augmented reality; web-based video; gamification; simulation	Incubation/office facilities; Subsistence allowance; Seed capital; Social media & advertisement
Market and product analysis	Web-based video; narrated stop-motion animation; generic modelling language; digital video; augmented reality; gamification; simulation; webinars	Example of success; Training; Social media & advertisement

Start-up stages	**E-education methodologies**	**Entrepreneurs and university's students' methodologies identification**
Achieving sustainability of entrepreneurial idea	Collaborative communities; cooperative learning; collaborative learning; network participation	Education; Economic/Financial facilities; Family support
Evaluation of entrepreneurial skills and characteristics	Flipped classroom using digital media; cooperative learning; collaborative learning; moving from fixing to online space; experiential online development; open educational practice; online learning environments; technology integrated teaching methods; digital storytelling; educational games; active learning	Follow-up support; Co-operative education

Source: Authors' elaboration based on Sousa et al. (2019).

Based on an empirical survey on entrepreneurial education at NBU and UNWE, the main digital tools used in entrepreneurial education to facilitate learning methods have been systematized (Table 6).

Table 6. Digital tools used in entrepreneurial education facilitating learning methods (LM)

"About" LM	**"For" LM**	**"Through" LM**
Online Education Platforms (e.g. Moodle), Virtual Classrooms, Zoom, Microsoft Teams, Google Meet, Skype	Webinars, Online Mentoring, Online meets with Entrepreneurs	Business Modeling Apps, Video Pitching, Virtual Teams on Entrepreneurial Ecosystems (EE) Analysis
All Materials (PPPs, Scientific Papers, Books, Videos) Provided in Virtual Environment	Case Study Sessions, Social Media Contacts and Communication	Investors Online Sessions
Online Tests & Assessment	Quiz (e.g. Kahoot, Beekast, other tools as above described in Table 3)	Virtual Business Modeling, Virtual EE Analysis

Source: Authors' elaboration based on empirical survey on entrepreneurial education in NBU and UNWE (Hadjitchoneva et al. 2023).

Certain common general challenges encountered in entrepreneurship education can be stated as follows: (i) a relatively narrow frame for entrepreneurship education (fitting into frames developed for more structured professions); (ii) scepticism regarding the possibility of acquiring key entrepreneurial competencies through education; (iii) reluctance of both students and teachers to thoroughly explore the possibilities of digital educational tools; and (iv) significant barriers to developing original (for Bulgaria) educational content for use through digital tools.

Digital educational tools have the potential to offer a range of opportunities in shaping entrepreneurial mindsets and competencies, but they also come with limitations to their effectiveness. Specifically, in both case studies, opportunities are closely related to factors such as the rapid metamorphosis of the 'Digital Native' generations, availability of education platforms that are quick to adopt (Open Source, Paid, On Subscription Basis), diversity of technologies and tools to use, learning from everywhere and at any time, and time optimization (e.g., no transport time loss). Digital tools can provide an interactive learning experience, enabling students to engage with the material through quizzes, games, and simulations, thus enhancing their understanding and retention of concepts. However, observations indicate that students and teachers are reluctant to use these types of tools, even though these educational tools can be personalized to meet the individual needs of each educational course, teacher, and student. They can thus provide a customized learning experience which can be tailored to specific entrepreneurial competences to be strengthened. An advantage of digital educational tools is related to the need for physical infrastructure. For instance, using a digital learning platform like Moodle can eliminate or reduce overhead costs compared to traditional classroom-based training.

However, some opportunities may present or contribute to certain limitations. Certain specific limitations include: (i) internet and technical equipment or tools being equal possibilities (e.g., PCs & mobiles without microphone & camera, high internet speed as connectivity problems can disrupt the learning experience, affecting students' engagement and performance); (ii) readiness to learn and adapt quickly (both professors and students); (iii) dependence on motivation and self-discipline progress; (iv) ease of procrastination; (v) additional investments (e.g., paid subscriptions); (vi) varying levels of technical competencies and ability to progress (digital gap); (vii) anonymity challenges; and (viii) challenges related to long-term digital concentration. Digital educational tools can limit opportunities for collaboration, discussion, and feedback, as well as for hands-on, practical experience. This is a critical component of entrepreneurship

education. Furthermore, they can make it difficult for teachers to identify areas where students may need additional support.

Digital learning environments can contribute to the overall effectiveness of entrepreneurship education by providing a flexible and scalable platform for delivering entrepreneurship content to students. By leveraging digital tools such as virtual learning environments, multimedia products, interactive learning content, and specialized software for experimental activities, entrepreneurship educators can create engaging and interactive learning experiences which cater to the diverse learning styles and preferences of students. However, the extent to which digital learning environments contribute to the overall effectiveness of entrepreneurship education depends on several factors, including scope and committed resources. Notably, the following barriers can influence the effectiveness of digital learning environments in entrepreneurship education: (i) outdated, irrelevant, or poorly designed content will not be effective in developing entrepreneurial competencies; (ii) non-engaging and non-motivating digital learning environments will not ensure that students remain interested and engaged in learning; (iii) additional, timely, and useful support is not provided as students progress through the course; and (iv) difficulties with access to technology, instructional design expertise, and technical support.

In order to take advantage of the opportunities of and limit the constraints of digital tools for shaping entrepreneurial attitudes and competences, our research has determined the following areas for the development of entrepreneurial education: (i) using traditional learning methods and digital learning methods as complementary tools, leveraging each where it has the strongest impact for training purposes; (ii) more digitalization at the "about" level learning methods (e.g., MOOCS); (iii) more face-to-face learning methods at the "for" and "through" levels learning methods; (iv) structural systematic approach importance for building lasting digital technology learning methods; (v) focusing on creativity and critical thinking; and (vi) prioritizing a humanity-centric approach for excellence in entrepreneurship education.

Data and Methodology of the Empirical Study

Evaluating the opportunities and limitations of digital educational tools in entrepreneurship education is a challenge requiring the development of a system of indicators and relevant criteria to measure the impact of using specific tools. In order to implement this approach, however, it would be appropriate to conduct a continuous study. This would require a significant investment of research resources. Instead, the chosen research approach is based on a survey of the opinions of students who have undergone stud-

ies in entrepreneurship at two Bulgarian universities. During these studies, they acquired knowledge about the main areas of entrepreneurial competences and training methods for developing these competences. The opinions studied concern both the degree of relevance of specific training methods to the development of a given area of entrepreneurial competences and the degree of familiarity of students with the most common digital tools applicable in teaching and their relevance to competence development. For exploratory purposes, the questionnaire used in this study identified areas of entrepreneurial competencies synthesized by Man (2001): (i) Opportunity – skills and competencies related to recognizing and developing market opportunities through various means; (ii) Relationship – skills and competencies related to person-to-person or individual-to-group-based interactions, e.g., building a context of cooperation and trust, using contacts and connections, persuasive ability, communication and interpersonal skill; (iii) Conceptual – skills and competencies related to different conceptual abilities, which are reflected in the behaviours of the entrepreneur, e.g., decision skills, absorbing and understanding complex information, and risk-taking, and innovativeness; (iv) Organizing – skills and competencies related to the organization of different internal and external human, physical, financial and technological resources, including team-building, leading employees, training, and controlling; (v) Strategic – skills and competencies related to setting, evaluating and implementing the strategies of the firm; and (vi) Commitment – skills and competencies that drive the entrepreneur to move ahead with the business.

Over the last two decades, other approaches have been attempted to systematize entrepreneurial competencies. Some of these attempts are presented in this paper. However, in order to reduce the risk of differences in the interpretation of the content of some of the competencies, Man's systematization was preferred, since it is both sufficiently comprehensive and understandable by students. With regard to the methods used in entrepreneurship education, the study presents the most popular ones employed in the teaching of the surveyed students in the disciplines they study. They are as follows: Development of a business plan/business model/feasibility study; Role play; Case studies; Guest speakers from practice; Visiting companies; Internship/learning experience in a company; Project for a newly started company (business model analysis and development proposal); Company survival project (strategy for overcoming crises); Growth management project (scale-up, chain building); and Social Media (Blog, Facebook, Twitter, LinkedIn).

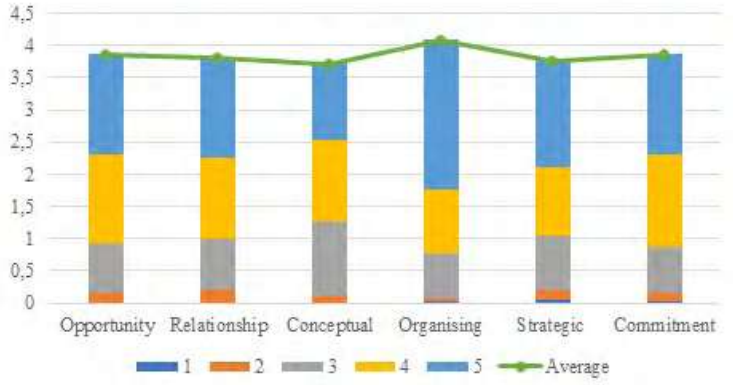
Finally, the questionnaire presents the following digital tools applicable in entrepreneurship education, for which students have to indicate their

level of familiarity and evaluate their application in terms of entrepreneurial competences formed: Virtual assistants (e.g., Siri, Google Assistant, Bixby and similar); Intelligent agent (interactive trainer, data organizer, etc.); ChatGPT, Virtual world (computer simulated environment and use of avatars); Flipped classroom (pre-training on a given topic in a virtual environment); Screencasting (video recording of the computer screen with audio included); Virtual learning environment; Interactive whiteboard; Augmented reality; Crowdsourcing (validating an idea by drawing on collective knowledge and experience); Learning and learning content management system (e.g., Moodle, eStudent and similar); Artificial Intelligence (data analysis, optimization, personalization, assessing); Massive Open Online Course (MOOCs); Educational games (Serious games); Authentic learning (learning by doing, developing a case study for a specific context, performing real tasks in a real environment); and Digital storytelling of entrepreneurial stories. The surveys were conducted in an online format between 13 May and 13 June 2023. Post-processing was done using the tools of descriptive statistics.

Results and Discussion

A total of 67 surveys were completed. Processing the gathered data yielded valuable insights and conclusions, enhancing our comprehension of the potential and limitations of digital tools in entrepreneurship education.

In terms of possessed entrepreneurial competencies, the students surveyed rated themselves relatively high, with average values ranging from 3.72 for conceptual skills to 4.09 for organizational skills (out of 5). Each competency area showed a range of scores, as illustrated in Figure 1.



Note: The lowest score is 1, the highest score is 5.
Figure 1: Distribution of students' skills self-evaluation
Source: Authors' elaboration.

Regarding the assessment of the role of training in developing competency areas, the survey recorded average scores. This indicated a belief in the thesis that entrepreneurial competencies are built through training. However, some students expressed scepticism, particularly concerning competences related to interrelationships, engagement with business, and associated responsibilities. Figure 2 presents the perceived effectiveness of various entrepreneurship education methods in building specific entrepreneurial competencies. For example, developing a business plan/ business model/feasibility study is viewed as a prominent learning method for competencies related to discovering entrepreneurial opportunities. Competencies linked to relationship building are significantly impacted by methods such as visiting enterprises and using social media. For strategic entrepreneurial competences, the most frequently indicated method is the development of a company survival project, followed by the development of a business plan/business model/feasibility study.

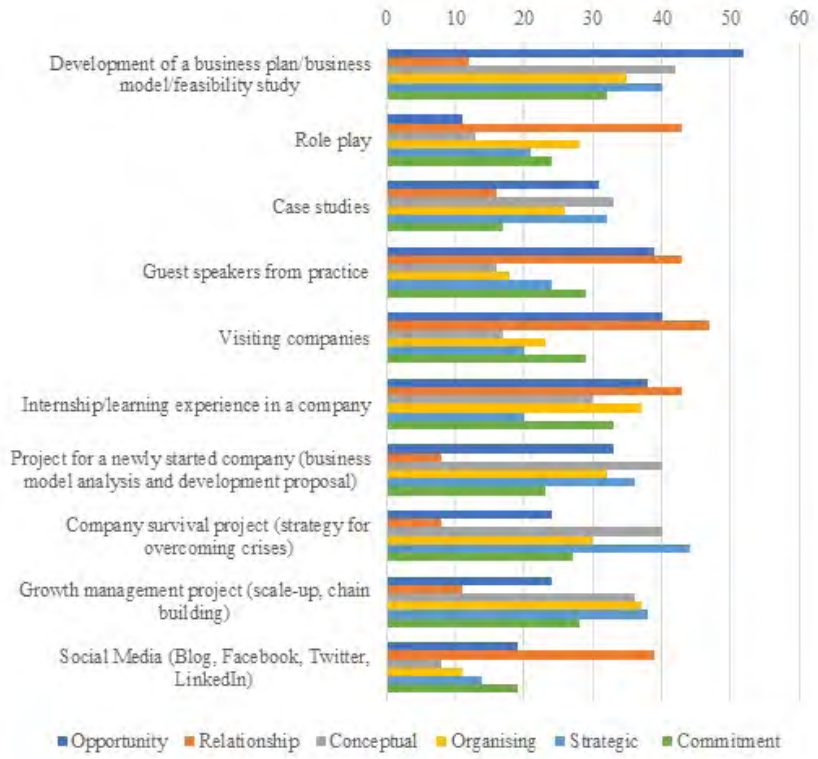


Figure 2: Effectiveness of methods for building entrepreneurial competencies (N=67)
Source: Authors' elaboration.

The applicability of digital tools within specific entrepreneurship education methods is largely determined by the nature of these methods. Digital tools find limited applicability, primarily serving as mediums. They can be used in methods such as lectures by practitioners, visits to enterprises, and internships (in a real environment). However, for other methods, digital learning tools can be applied to varying degrees. Social media emerges as the top choice, followed by the development of business plans and various projects tailored to different phases of an enterprise's life cycle.

In this context, it might be assumed that digital tools primarily contribute to the development of conceptual and strategic entrepreneurial competences. This assumption could be further validated through follow-up questions in the survey.

In the empirical study, students demonstrated varying degrees of familiarity with a range of digital learning tools. Virtual assistants (e.g., Siri, Google Assistant, Bixby, and similar), interactive whiteboards, and learning content management systems (e.g., Moodle, eStudent, and similar) were the most familiar, while Massive Open Online Courses (MOOCs), augmented reality, and virtual worlds (computer simulated environment and use of avatars) were the least familiar.

Concerning the role of specific digital educational tools in preparing students as entrepreneurs, students considered authentic learning (learning by doing, developing a case study for a specific context, performing real tasks in a real environment), intelligent agents (interactive trainer, data organizer, etc.), and artificial intelligence (data analysis, optimization, personalization, assessing) as the most significant. The high score of these tools was likely due to the natural desire of entrepreneurs to minimize risks related to lack of information and uncertainty.

On the other hand, students rated augmented reality, virtual worlds (computer simulated environment and use of avatars), and Massive Open Online Courses (MOOCs) as the least significant digital educational tools. Augmented reality and virtual worlds were perceived as visualization tools with no particular practical value for entrepreneurial careers, while MOOCs were relatively unpopular in respondents' educational practice.

In assessing the possibilities and limitations of digital educational tools in entrepreneurship education, evaluations by students of the role of specific tools in the formation and development of each group of entrepreneurial competencies proved crucial. Figure 3 illustrates the differentiation in the capabilities of specific digital tools for respective competency groups.

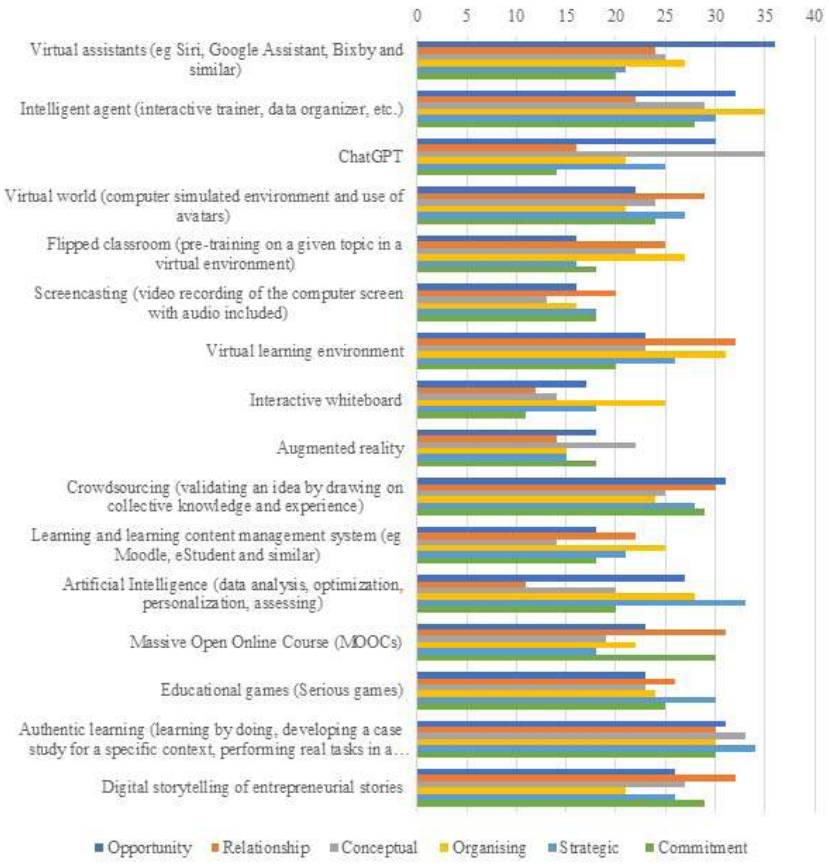


Figure 3: Capabilities of digital tools for building entrepreneurial competences (N=67)
Source: Authors' elaboration.

The assumption that digital learning tools, in general, would be primarily useful for the development of conceptual and strategic entrepreneurial competences, is not confirmed.

Albeit in varying proportions, digital educational tools are rated as almost equally important in the formation of each group of competences. By a small margin, they are rated as significant in the formation of organizational competencies and competencies related to the discovery of entrepreneurial opportunities. Unsurprisingly, digital tools are given the least priority in the formation of competences related to commitment to the business (commitment).

The utilization of digital learning tools in entrepreneurship education should align with learning objectives which vary according to the types of entrepreneurship education. These types correspond, to a significant ex-

tent, with the main phases of the entrepreneurial process: (i) assessment and self-assessment of own potential (attitudes, personal characteristics, behaviour) for entrepreneurship; (ii) selection and structuring of the entrepreneurial idea; (iii) development of a business model/business plan; (iv) securing financing (investors, business angels, etc.); and (v) business development and growth. Figure 4 presents the relevance of different digital learning tools to these entrepreneurial process phases. However, it is notable that some phases did not perceive any digital tool as particularly relevant, such as funding provision, where no digital tool was mentioned by more than a third of respondents.

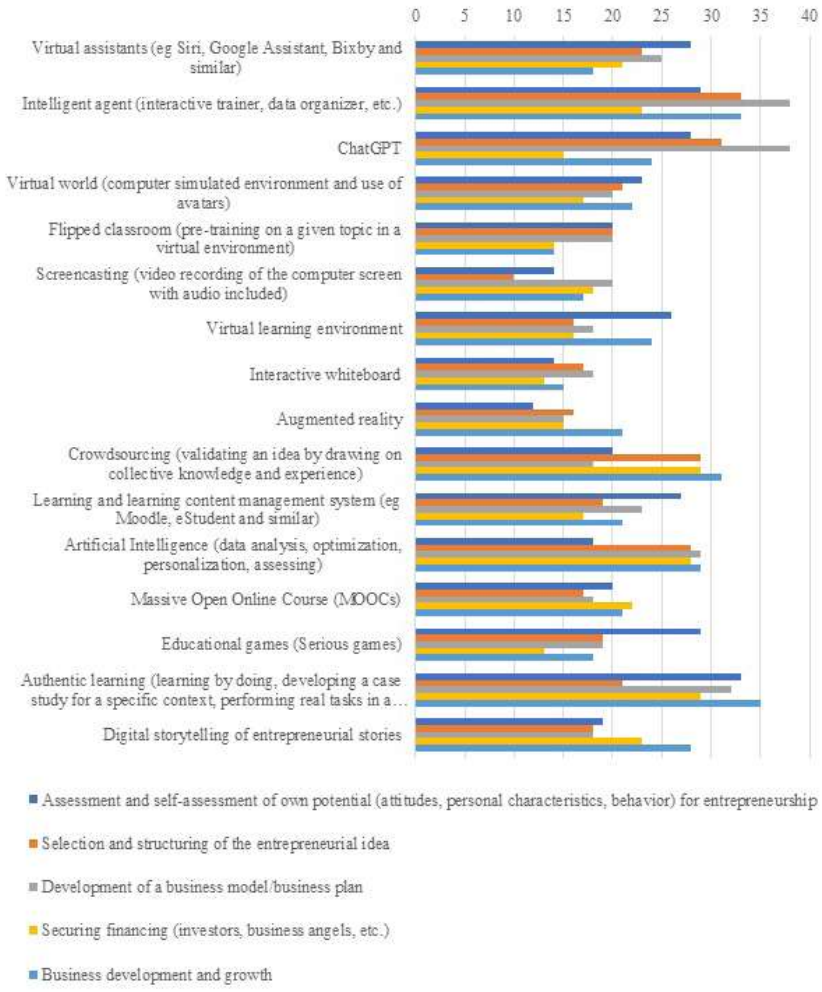


Figure 4: Capabilities of digital tools in terms of their relevance by entrepreneurial process stages (N=67)
Source: Authors' elaboration.

Assuming that a digital tool is significant, if mentioned by more than half of respondents, only two such tools were notable in one of the phases: Intelligent agent and ChatGPT in the Development of a business model/ business plan phase. Intelligent agent was close to 50% relevance in the Selection and structuring of the entrepreneurial idea phase, while Authentic learning was significant in the Assessment and self-assessment of own potential and Business development and growth phases.

Certain digital tools, such as Flipped classroom, interactive whiteboards, and augmented reality, garnered relatively low popularity, being mentioned by less than one third across all stages. This can be attributed to their perception as modern technical tools aimed at facilitating learning rather than providing practical useful content. Some digital tools were not particularly popular. For example, Educational games (Serious games) were perceived as most important in the first stage of the entrepreneurial process, ChatGPT at the third stage, and Digital storytelling of entrepreneurial stories at the fifth stage.

Favourites among all digital tools were Intelligent agent and Authentic learning, while the least relevant ones in the considered context were Interactive whiteboard, Screencasting, and Augmented reality.

In conclusion, the analysis of responses regarding the relevance of digital tools by the stages of the entrepreneurial process reveals a certain scepticism and perhaps an assumption that these tools cannot displace other traditional methods and approaches in acquiring the knowledge and skills needed to meet the challenges encountered in the different stages of the entrepreneurial process.

Conclusion

The empirical study conducted in this research sheds valuable light on the role of digital tools in entrepreneurship education. The insights acquired from analysing the data of 67 completed surveys provide a nuanced understanding of the possibilities and limitations that these tools present. In terms of Entrepreneurial Competencies, the self-assessment by students reveals a relatively high level of confidence, with particularly strong ratings in organizational skills. These self-perceived competencies are crucial, since they form the basis upon which the impact and effectiveness of education, including digital tools, are defined. Effectiveness of Training and Education Methods in building entrepreneurial competencies is also highlighted. The survey indicates a belief in the significant role which training plays in competency development. Methods such as developing a business plan/business model/feasibility study and engaging with case studies are perceived as particularly effective in enhancing entrepreneurial abilities.

The Familiarity and Perception of Digital Tools varied among students. Virtual assistants, interactive whiteboards, and learning content management systems were widely recognized and considered significant. On the other hand, augmented reality, virtual worlds, and Massive Open Online Courses (MOOCs) were less familiar and perceived as less relevant. This is possibly due to a lack of practical value in entrepreneurial careers or relative unpopularity. Strategic Alignment with Learning Objectives and Entrepreneurial Phases is crucial when integrating digital tools into entrepreneurship education. Aligning the use of digital tools with specific phases of the entrepreneurial process ensures their relevance and effectiveness. Tools such as intelligent agents and authentic learning were notable in certain phases. This suggests their potential in enhancing entrepreneurial skills. Perceived Significance of Digital Tools in Entrepreneurship Education, when viewed through the lens of different entrepreneurial competencies and phases, demonstrates a cautious approach. On the other hand, certain tools such as authentic learning and intelligent agents were recognized for their importance. Others such as interactive whiteboards and augmented reality were seen as less relevant, reflecting a certain scepticism about the disruptive potential of digital tools.

Overall, the empirical study emphasises the need for a nuanced and thoughtful approach when integrating digital tools into entrepreneurship education. It highlights the importance of aligning these tools with specific learning objectives, competency development, and entrepreneurial phases to optimize their impact. The findings present a valuable resource for educators and stakeholders who aim to leverage digital tools effectively in shaping the entrepreneurial mindset and competencies of future business leaders.

Further research and continued exploration in this domain are essential, in order to maximize the potential of digital tools in entrepreneurship education. While this study provides valuable insights into the role of digital tools in entrepreneurship education, it is important to acknowledge its limitations. One significant limitation is the relatively small sample size, comprising 67 surveys from students in only two universities in Bulgaria. This restricts the ability to generalize the findings to a broader population. Additionally, focusing on a specific geographic region limits the cultural and contextual diversity of the study.

Thus, future research would aim for a larger and more diverse sample size, including participants from various universities, regions, and even countries. This would provide a more comprehensive understanding of the role of digital tools in entrepreneurship education on a global scale.

Conducting longitudinal studies would offer insights into the evolving impact of digital tools on entrepreneurial competencies over time. Fol-

lowing students throughout their education and into their entrepreneurial ventures could provide valuable data on the long-term effectiveness of digital tools. Comparative studies between different educational systems and cultural contexts could shed light on the influence of these factors on the perception and effectiveness of digital tools in entrepreneurship education. Understanding these variations is essential for tailoring strategies to specific contexts. In addition, combining quantitative insights with qualitative research methods, such as interviews or focus groups, would provide a deeper understanding of students' perceptions, motivations, and challenges in the use of digital tools. Qualitative data can establish nuances which quantitative data might miss. Future studies could involve industry professionals and stakeholders in the research, who would offer practical insights into the specific digital tools most relevant and effective in real-world entrepreneurial scenarios. In-depth studies of specific digital tools could even be considered, in order to evaluate their impact on particular competencies. Understanding the unique contribution of each tool can enable educators to tailor their usage to specific learning objectives.

Addressing these limitations and pursuing these recommendations will contribute to a more comprehensive understanding of the role of digital tools in entrepreneurship education and enhance the effectiveness of educational strategies aimed at fostering entrepreneurial competencies.

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