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FOSTERING ENTREPRENEURIAL MINDSETS IN ENGINEERING EDUCATION: INSIGHTS FROM A CASE STUDY OF GREEN INNOVATION INITIATIVES

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Abstract: *In the contemporary economic landscape, the university ecosystem actively promotes relevant occupational skills among students. These skills contribute to the advancement of business communities within Romania. To achieve this, higher education institutions seek to enhance students' entrepreneurial competencies through targeted educational initiatives. The study included 215 participants, aged 20 to 25 years. This demographic, focused on young adults, is essential for interpreting the scope and applicability of the findings. These individuals expressed a willingness to engage in entrepreneurial programs and activities within the academic sphere. The study proposed the use of specific tools and frameworks to establish a new strategic direction, referred to as a "blue ocean," by creating an entrepreneurial centre. This hub engages stakeholders from Timisoara and provides practical green entrepreneurial workshops with tangible decision-making implications. The integration of entrepreneurial skills into the university learning environment began with the discovery of business tools. These tools facilitated the development of workshops focused on enhancing green entrepreneurial knowledge, skills, and attitudes (KSAs).*

Keywords: *students, creative thinking, educational projects, university, education, entrepreneurship, skills, competencies.*

1. INTRODUCTION

In the business environment, the meaning of “entrepreneur” refers to a person who has an idea and turns it into a business, assuming the associated risks. The entrepreneur is also a person who can explore innovative opportunities [1]. Obviously, the field of entrepreneurship follows the natural course of evolution, becoming an intermediate means of aggregating resources, which is still noticeable today. Entrepreneurship generates substantial social value by benefiting employees, customers, partners, and the media. Entrepreneurs play a critical role in job creation and in attracting essential capital through their activities [2]. Entrepreneurship matters because it can raise living standards and build wealth for both business owners and the communities around them. [3]. Entrepreneurs drive change by introducing innovative products, which in turn create opportunities for the development of new

markets [4]. The integration of entrepreneurship into educational curricula has generated significant interest among educators and policymakers over the past several decades [5]. The new relationship *Edu-preneurship*, the integration of education and entrepreneurship, fosters innovation, economic development, and social resilience [6],[7]. It equips students with practical competencies such as creativity, risk management, and problem-solving through experiential learning and access to professional networks. This approach enables students to acquire workforce-relevant skills, transform concepts into viable solutions, and actively participate in an evolving economy.

Entrepreneurial education is a highly important and popular topic today, so it is essential to create hands-on projects to explore the opportunities this area presents. Besides learning about entrepreneurship, personal qualities, skills, creativity, and experience are also very important, especially when put into a

hands-on project [8]. Schools and universities are the main places where these entrepreneurship projects are developed. Entrepreneurship education it should be delivered within an institutionalized framework such as the university ensuring coherence and systematic implementation [9]. Entrepreneurship education focuses on several skills, such as: the use of specific concepts to explain and interpret real-life processes and facts, the application of specific knowledge in certain situations characteristic of the market economy and the analysis of personal development possibilities [10]. The development of entrepreneurial skills requires an inner orientation and a well-thought-out initiative on the part of the trainers. Modeling entrepreneurial culture and literacy among university students in developed countries is quite intriguing. Graduates play a key role in fostering an economically vibrant entrepreneurial environment characterized by competitiveness, innovation, and creativity. The business community requires students to possess a diverse set of skills and competencies, particularly the ability to think critically and solve problems in creative ways [11]. In Romania, national education policies emphasise the connection between education and the labour market, highlighting the importance of developing fundamental students' skills through entrepreneurial projects. For instance, at Politehnica University Timișoara (UPT) students are encouraged to create and implement their own startup projects due to the numerous business initiatives available. This motivation fosters the pursuit of effective ideas and signals opportunities within the entrepreneurial field.

In recent years, interdisciplinary approaches and globalization have transformed student communities into collaborative environments that extend beyond nationality, culture, and context. The development of skills for students has become an increasingly important topic, particularly with the rise of digitalization in teaching and learning [12]. As a result, university students have enhanced their communication abilities, collaboration skills, information networking, feedback reception, teamwork, and, in some cases, cultural understanding. These improvements have been facilitated by

significant changes in the university curriculum, the expansion of networking opportunities, and active social debates led by key influencers and stakeholders. Furthermore, academic research and initiatives aimed at transforming university governance have resulted in the redesign of engineering faculties, placing a greater emphasis on student skills and offering unique academic programs [13]. Romania's universities, particularly its engineering schools, are well-respected and renowned within the education and academic communities. They continue to provide prestigious Bachelor's, Master's, and Ph.D. programs that contribute to the country's economic and intellectual advancement. The university's research and scientific training is based on the strategy of promoting multidisciplinary research and teaching, given the priority to new technology through which students develop new skills. UPT has 10 faculties of which 8 faculties have engineering specializations. Regardless of the faculty, events with the entrepreneurial education for students' theme are supported and developed, which aim to develop key entrepreneurial skills such as: fostering creativity, promoting teamwork, cultivating perseverance, building self-confidence, encouraging initiative, embracing responsibility, taking calculated risks, enhancing understanding, and improving resource management. Universities are providing opportunities for students to experiment with their entrepreneurial skills through themed projects [14]. Implementing entrepreneurship modules is an effective way to transfer knowledge, as it involves mentoring by successful entrepreneurs [15]. These experiences influence students, equipping them with the skills they need to become future business owners in the work environment [16].

In this context, the authors were involved in a project developed by Ruhama Foundation named "Active Students in the Community: From Student Life to Profession", as trainers and mentors for students. The authors were also involved in developing entrepreneurial courses and workshops on sustainable business.

Within this project students had the opportunity to gain knowledge about the realization of a business plan, starting from the identification of the business idea, the

identification of the legal form of financing, the necessary material and financial resources, and forecasts of income and expenses.

The paper reviews the literature on entrepreneurial knowledge, skills, and attitudes in higher education, which mentions the specific competencies of students who are trained in entrepreneurship education. Through this research, the essential elements in the development of the students' entrepreneurial competencies are updated. After the literature review, the authors present the methodology used in the research. The methodology comprises two stages. In the first stage, the questionnaire was used to identify the interest shown by UPT students in the development of programs and entrepreneurial initiatives in the academic environment. The research team aims to utilise this questionnaire as a comprehensive tool to encourage the entrepreneurial hub "InoHub UPT" in Timisoara by creating a "blue ocean" strategy that engages various business stakeholders. This initiative will also include applied entrepreneurship workshops with real decision-making implications. In the second stage, the authors employ Blue Ocean Strategy (BOS) tools, such as the Strategy Canvas (SC) and the Eliminate-Reduce-Raise-Create (ERRC) grid. By using these tools, new practical activities were identified through which students were interactively involved. Also, the proposal in using the BOS was to create innovations that can sustain business in Timisoara through future students from UPT. The last part of the research presents the findings of the study. The overall conclusion of the study is that collaborating with the business community is a good way to improve an institution's curriculum and identify practical teaching elements for students to develop the necessary skills - both hard and soft skills.

2. ENTREPRENEURIAL MINDSET IN HIGHER EDUCATION

This paper reviews literature on entrepreneurial mindset in higher education, focusing on the specific competencies developed through entrepreneurship education [17]. These competencies—problem-solving,

decision-making, creativity, innovation, and digital literacy—are outcomes of a structured learning process where individuals acquire essential traits for entrepreneurial tasks through ongoing social and physical interactions [18], [19], [20]. An innovative educational framework must promote a proactive mindset that goes beyond basic business knowledge to equip students with the ability to identify and capitalize on opportunities in dynamic economic environments [21], [22]. This strategy aims to develop a comprehensive set of skills, including creativity, empathy, and tolerance for ambiguity, that enable students to learn from failures and share critical feedback [23]. Skill development encompasses both theoretical understanding and practical application of knowledge in real-world contexts [24]. Ultimately, entrepreneurship education is designed to cultivate an entrepreneurial mindset by promoting behaviors and skills that enable young people to start and lead new organizations, improve innovative and strategic thinking, build confidence, and improve communication and collaboration skills [25], [26].

Regional development depends on the presence of both large and small businesses. UPT has established collaborative relationships with major companies in the area and is dedicated to supporting small entrepreneurs through a comprehensive entrepreneurship education program. This program equips aspiring entrepreneurs with essential skills and knowledge and creates a network that supports innovation and sustainable business practices. By nurturing small businesses, UPT contributes to local economic growth and promotes a diverse entrepreneurial ecosystem. UPT participates in various projects focused on entrepreneurship, demonstrating its commitment to innovation and business development. The institution is involved in three major national entrepreneurship initiatives, each designed to support entrepreneurs and stimulate economic growth. These projects highlight UPT's dedication to promoting the entrepreneurial spirit and provide platforms for collaboration and knowledge exchange within the business community.

- StartUPT Project functions as a business accelerator designed for students across the country who seek to establish startups in regions other than Bucharest-Ilfov. The initiative supports the development of innovative ideas in sectors such as Information Technology, creative industries, tourism, healthcare, and renewable energy. As part of this comprehensive program, we have successfully delivered nationally accredited entrepreneurship courses to over 341 students, comprising both master's and doctoral candidates, originating from less developed regions. These courses are designed to equip aspiring entrepreneurs with the essential skills, knowledge, and practical tools needed to establish and grow a successful business within economically promising sectors. By fostering entrepreneurial talent and providing valuable resources, the StartUPT Project aims to stimulate local economies and promote sustainable business practices, ultimately contributing to the overall economic development of the regions involved.

- One notable achievement is that UPT actively partners in the European project E³UDRES²—Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions.

The goal of the E³UDRES² consortium is to create a European multi-university campus that serves as a hub for smart and sustainable innovations tailored to small and medium-sized cities and their surrounding rural areas. This project inspires and nurtures students' talents, enabling them to transform their ideas into businesses that are rooted in local communities yet connected on an inter-national scale.

- Ruhama project "Active students in the community: from student life to profession"

The project is focusing on 4 parts:

1. Career Counseling and Guidance Program: (1) workshops and networking with professionals (2) self-assessment, (3) individual counseling and (4) mentoring to help them clarify their career direction, develop relevant skills and plan internships for a successful transition to the labor market.

2. Socio-emotional skills training program: 4 key socio-emotional skills: communication, teamwork and collaboration, problem solving and critical thinking, time management and

organization. (1) Individual meetings in the form of individual coaching sessions with students, personalizing the approach according to their needs and learning style. (2) Group workshops conducted by mentors encouraging active participation and exchange of experiences among students;

3. Entrepreneurial skills program with the integration of sustainable development skills to contribute to green jobs and the green economy.

4. Award competition "Practical exercises - business ideas that create green jobs and contribute to the green economy".

This research centers on the Ruhama project due to the authors' direct involvement as trainers for students in the creation and delivery of entrepreneurial courses and workshops on sustainable business. Their engagement in this initiative has provided valuable insights into effective teaching methodologies and the challenges faced in fostering green entrepreneurship among students. The authors aim to explore the impact of these educational programs on students' entrepreneurial skills and their overall development.

3. RESEARCH METHODOLOGY

At the outset of the research, a detailed questionnaire was carefully developed and shared to gather insights into how people perceive the entrepreneurial learning environment. This environment is focused on setting up the UPT entrepreneurial competence hub, which is meant to help students build and improve their entrepreneurial skills. The main goal of the survey was to find out what students think are the most important qualities and skills for an entrepreneur, how much they have learned in this important area, and which activities outside of regular classes might help them learn more about entrepreneurship. The survey also wanted to find out what interests might draw them to become entrepreneurs and what obstacles might make it harder for them to develop basic entrepreneurial skills. The survey included 215 randomly chosen students from UPT, from different departments and both bachelor's and master's programs. All students were between 20 and 25 years old, giving a

lively mix of young opinions. The questionnaire designed is based on four main constructs:

- i) Identifying professional preferences,
- ii) Drawing the entrepreneur profile,
- iii) Desired activities to implement for entrepreneurship,
- iv) Identification data.

- *Identifying professional preferences*

At the start of the questionnaire, participants were asked about their family background related to starting businesses. This included asking if any family members had run a business and how those experiences may have shaped their own views. Respondents were also asked to name the most important qualities for a successful business. The questions covered their career goals, letting them say if they see themselves in regular jobs or want to start their own business. Participants were also asked to explain why they might choose to become entrepreneurs, considering reasons such as personal interest, a desire for independence, and the hope of earning money. This approach aimed to gain a deeper understanding of what motivates people and how their families influence their career choices.

- *Drawing the entrepreneur profile*

In the second part of the questionnaire, people were asked to talk more about important parts of entrepreneurship. They were asked to describe an entrepreneur in one word that best shows what they are like. They also listed the skills they think are most important for an entrepreneur to succeed in business, like leadership, resilience, and creativity. The questionnaire also looked at how important education is for entrepreneurs, asking people how much they think formal training and education help an entrepreneur do well and help their business succeed. People also shared their own experiences by saying if they had taken part in any entrepreneurship training programs or courses. They talked about doing things like making a detailed business plan and described the type of business they want to start in the green sector. This part of the questionnaire was meant to get a clear picture of what people think and have experienced about entrepreneurship.

- *Desired activities to implement for entrepreneurship*

In the third part of the questionnaire, participants were asked to share their thoughts on different problems they faced when starting a business. This included looking into specific problems like trouble getting money, dealing with rules, and not having enough chances to meet other people in business. The survey also looked at how learning about entrepreneurship in school affects starting a business, especially whether what people learn in class helps them succeed. The questionnaire asked about the best ways to learn about starting a business, such as learning by doing, having a mentor, or using online tools. Participants were asked to say what kind of help they think is most important for starting their own business, and to share ideas about other activities outside of business that could help build business skills. Another key part of this section was asking how important it is to take part in regular entrepreneurship activities at UPT. This included choosing between different types of activities like short courses, interesting talks, practical workshops, group meetings, and debates. Respondents were also asked how long these activities should last to fit their schedules. The survey also wanted to know how important it is to have a special training center for learning business skills at UPT. Participants were asked to think about what interests them most as future business owners, so the survey could better understand what skills and knowledge they want to gain in the next two years.

- *Identification data*

In the last part of the questionnaire, called the fourth phase, participants were asked to give detailed information about themselves. This section asked about their ages and genders to better understand who took the survey. It also asked which university diplomas they earned during the 2023-2024 school year. To get more information, participants were also asked to say which faculty they belonged to, showing the different areas of study in the group. (Table 1)

Table 1

The demographic characteristics of the survey

Variable	UPT students
Gender	
Female	58,9%
Male	40,2%
Non gender	0,9%
I don't want to declare	2,8%

Age	
Less than 20 years old	8%
Between 21 and 25 years old	92%
Education	
Bachelor's	68%
Master's	32%
Faculties	
Architecture and City Planning	0,5%
Automation and Computers	20%
Industrial Chemistry and Environmental Engineering	0,9%
Civil Engineering	0,5%
Electronics, Telecommunications and Information Technologies	25%
Electrical and Power Engineering	0,6%
Management in Production and Transportation	50%
Mechanical Engineering	2%
Communication Sciences	0,5%

The next phase of the research was formulated after a thorough analysis of the respondents' feedback concerning the business workshops designed to enhance areas such as business development, communication skills, and personal branding for green start-ups.

The feedback received was overwhelmingly favorable, with over half of the responses indicating a positive involvement (68%) at bachelor level.

These workshops aim to give students the right attitudes and skills to handle the challenges of today's business world, helping them grow both personally and professionally. By focusing on these important skills, the research looks to find areas that need improvement and adjust future training programs to better fit what students need.

4. CREATING A BLUE OCEAN FOR ENTREPRENEURIAL MINDSET IN UPT

Kim and Mauborgne demonstrate how Blue Ocean Strategy (BOS) can be applied and propose disruptive innovation-based tactics, especially in established industries with a backward tradition. It is a new vision for higher education institutions what BOS can do, as innovative approach. Blue ocean strategy provides an effective framework for universities that want to manage their future growth and development in an increasingly competitive landscape. The BOS are two critical

components: enhancing customer value through strategic differentiation and implementing cost reduction measures. This approach fosters a sustainable competitive advantage, as it comprehensively examines the interplay between utility, pricing, and associated costs [27]. Applying BOS in a university setting requires identifying its specific benefits. BOS allows universities to avoid direct competition for students, programs, and research fields. By adopting BOS principles, institutions can create unique value, enter new markets, reduce resource constraints, and enhance differentiation. This approach can attract new student groups and research partners, helping the university stand out in the educational landscape [28]. This paper outlines a strategic initiative in higher education aimed at enhancing outcomes for engineering students. The research team applies Blue Ocean Strategy (BOS) tools, such as the Strategy Canvas (SC) and the Eliminate-Reduce-Raise-Create (ERRC) grid, enabling UPT to identify and pursue new market segments and niche opportunities. The initiative emphasizes student engagement through workshops on business development, communication, and personal branding. These activities foster critical thinking, creativity, and essential professional skills for success in engineering. The program provides students with practical experience to strengthen their workforce readiness. This approach helps students develop professional skills and improves their prospects for placement in leading engineering organizations in Timisoara. The initiatives described here bridge the gap between academic theory and practical application, enriching education and better preparing graduates for their careers.

4.1 Diagnostic framework through SC

A Strategy Canvas (SC) functions as a critical diagnostic tool for depicting a university's strategic positioning using a Blue Ocean Strategy (BOS) framework. For prospective students at UPT, comprehending and contributing to the economic development of western Romania is essential. This objective underscores the necessity for a robust partnership between industry stakeholders and university representatives to pinpoint the

desirable attitudes, competencies, and skills that are essential within the engineering sector. Engineers have diverse specializations; some focus on micro-engineering, developing intricate components that are only visible through microscopes, while others create widely-utilized everyday products like mobile phones and laptops. Furthermore, there are those who design and construct large-scale engineering projects such as automobiles, aircraft, and skyscrapers. Engineering students possess a unique set of skills that enable them to transform innovative concepts into tangible solutions that meet real-world needs. [29] As the breadth of human knowledge and societal demands expands, so too does the requirement for skilled engineers, indicating a future rich with opportunities for those in the field.

In the context of this paper, strategic criteria have been identified as key determinants of the relative competencies of students. The strategic factors selected for the Strategy Canvas include:

- Blended Learning: A blend of conventional teaching methods and modern instructional techniques that address a variety of learning styles.
- Communication Skills Development Projects: Programs aimed at improving students' capability to express their thoughts clearly and participate in constructive discussions in professional environments.
- Technical Skills Enhancement Projects: Opportunities that emphasize the development of specialized technical abilities crucial for success in engineering.
- Collaborative Project Practices: Participation in initiatives that encourage collaboration and joint problem-solving, mirroring actual engineering methodologies.
- Problem-Solving Strategy Seminars: Sessions focused on developing strategic thought processes and creative methods to address intricate engineering issues.
- Motivational Initiatives for Environmental Protection: Initiatives that motivate students to seek engineering solutions that benefit the environment and promote sustainability.
- Social Engagement Activities (Career Days): Activities that promote networking and

career discovery, connecting academia with the professional sphere.

- Hands-on Workshops: Hands-on sessions that enable students to utilize theoretical concepts and acquire direct experience with engineering methods and instruments.

The overall value proposition for the UPT suggests that the institution will encounter considerable difficulties in fulfilling its varied needs, ultimately yielding to the fierce competition characteristic of the "red ocean" within higher education. To successfully maneuver through this competitive environment, UPT should focus on establishing strategic collaborations with industry leaders. Such collaborations will allow students to participate in practical, real-world projects, thereby enriching their educational experiences and improving their employability.

Utilizing the BOS as a framework for its strategic planning process, UPT's strategic committee should focus on discovering new, unoccupied market areas that set the institution apart from its rivals. This creative strategy will enable UPT to develop distinctive professional competencies that correspond with market requirements, thereby equipping students to excel in their chosen fields. By emphasizing innovation and uniqueness, UPT can establish an educational setting that not only addresses present industry demands but also anticipates future developments, ultimately nurturing a prosperous environment for both students and employers. A supplementary tool in the BOS Strategy for improving the identified UPT segment is the ERRC grid. This framework, introduced by Kim and Mauborgne in their seminal 2005 publication, acts as a strategic matrix that encourages universities to focus on four essential actions simultaneously: eliminating inefficiencies, reducing underperforming elements, elevating standards, and generating innovative offerings. By engaging with this grid, institutions can strive to uncover a new "blue ocean" of opportunities, devoid of fierce competition. After the strategic committee pinpointed a promising sector—specifically, Hands-on Workshops reinforced by the backing of significant industry influencers—the next step is to develop targeted initiatives

aimed at increasing value and creating new demand. This strategy not only leverages current market trends but also aims to create a distinctive stance that appeals to potential attendees, cultivating a vibrant learning environment that aligns with the changing requirements of the market.

4.2 The four actions framework Eliminating - Reducing - Raising - Creating (ERRC)

Table 2 outlines a detailed four-actions framework that incorporates the ERRC (Eliminate, Reduce, Raise, Create) grid tailored for UPT students. The university needs to perform a thorough assessment of its existing teaching resources to ensure their relevance and effectiveness. This assessment should emphasize identifying which student programs show sustainability and directly aid in promoting the university's overall vision. Programs that do not correspond with the university's strategic goals should be gradually discontinued or significantly scaled back to make the best use of resources. Additionally, it is crucial to introduce new competency programs that are carefully designed to align with the university's vision of becoming a leading national educational institution. In doing this, the university can not only increase its attractiveness to potential students but also create new opportunities for both local and international enrollment, ultimately expanding its influence and presence within the academic community.

Table 2

ERRC grid.
Eliminating inefficiencies
1. Information that is old and no longer relevant does not align with current knowledge and practices.
2. Teaching approaches that are too strict or rigorous may not cater to different learning styles and can lead to undue stress for students.
Raising standards
1. Motivate young individuals to engage in various initiatives that contribute to their personal and professional growth.
2. Hold regular round table discussions to encourage open communication and idea exchange among youth.
3. Present innovative research and studies that cater to the interests and needs of the newer generation.
4. Utilize social media platforms effectively to promote educational materials and encourage collaboration.
5. Organize a variety of social events aimed at providing students with opportunities to share and learn

from multicultural experiences, thus promoting understanding and appreciation of diverse backgrounds.

Reducing underperforming aspects

1. Traditional methods of instruction
2. A surplus of theoretical ideas, which allows minimal opportunity for hands-on application
3. Obsolete technology and materials, like chalkboards and worn-out projectors

Creating innovative offerings

1. Enhanced Laboratory Performance: laboratories are furnished with state-of-the-art technology and streamlined processes, ensuring that experiments and research endeavors achieve the highest levels of efficiency and precision.
2. Innovative Use of Real-World Data: by incorporating authentic datasets from both industry and academia, we provide practical learning experiences that connect theory to practice, empowering students to make informed, data-driven choices.
3. Customized Learning Experiences: personalized educational pathways are designed to fit individual learning preferences, promoting a deeper comprehension of concepts and motivating students to reach their full potential.
4. Engaging Digital Workshops: digital workshops utilize advanced online tools and resources, allowing participants to partake in collaborative problem-solving and innovation, regardless of their physical location.
5. Thorough Competency Models for Each Discipline: we offer comprehensive competency frameworks for every academic field, specifying the essential skills and knowledge areas crucial for achievement, assisting both learners and educators in aligning curricula with career aspirations.

5. HANDS-ON WORKSHOPS: BUSINESS PLAN THROUGH CANVAS FRAMEWORK

The workshop was conducted collaboratively by the research team and UPT's key industry partner, who shared their practical methods for improving the student learning experience. In order to establish a clear pathway for UPT's students, the Knowledge Skills and Attitudes (KSA) model has been implemented. By concentrating on the integration and advancement of these three elements, the KSA model offers a comprehensive approach to workforce development, ensuring that students possess not only knowledge and skills but also the appropriate attitudes to succeed in their positions (Fig. 1).

The KSA model is commonly applied across different fields, such as education, healthcare,

and corporate settings, to guide training initiatives, evaluate performance, and shape recruitment approaches.

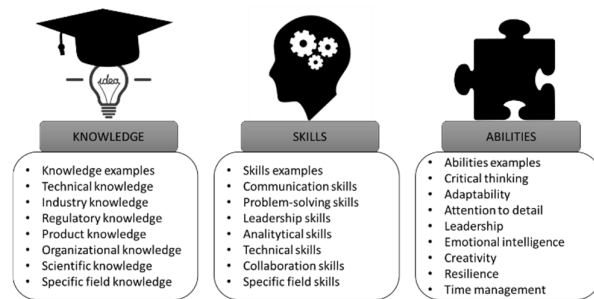


Fig. 1. KSA model.

The KSA model was first introduced during a workshop conducted by the key industry partner from Timisoara, which took place during the Green Entrepreneurship teaching seminars at the Faculty of Management in Production and Transportation. The integration of the KSA model ensures that students not only acquire essential knowledge but also develop the skills and professional attitudes necessary to thrive in their careers, effectively bridging the gap between academia and industry. Based on the KSA results, students were divided into teams to develop a business plan using the Business Model Canvas.

The Business Model Canvas, developed by Osterwalder and Pigneur (2010), comprises nine building blocks designed to facilitate value creation for external stakeholders. [30] Students may employ this framework as a structured checklist to guide value creation planning (Fig.2).

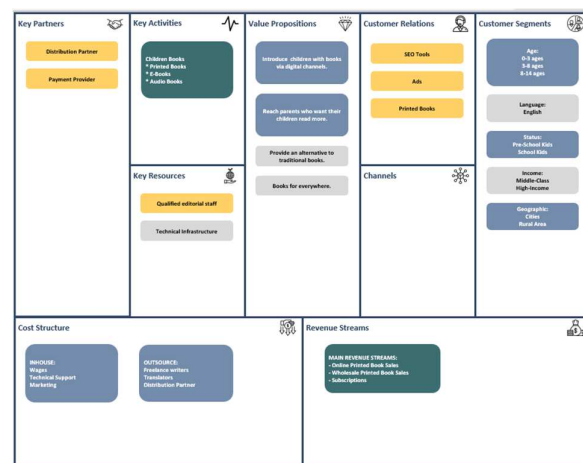


Fig. 2. The Business Model Canvas.

The Canvas encourages users to address key questions regarding target beneficiaries, methods of assistance, collaborators, and core activities. This tool is particularly effective in group settings, enabling teams to collaboratively visualize and refine their ideas. Although the terminology is oriented toward business, the underlying principles are applicable in broader contexts.

Students from 3-year Bachelor on Faculty of Management in Production and Transportation were divided into 10 teams of 6 students. Each team had a green business idea to finish in 6 hours.

Based on the results from KSA model some students were assigned to draw theoretical concepts, principles, and factual information in decision-making and problem-solving (Knowledge) some students with practical abilities were actively engage to perform tasks and activities proficiently using technical skills and soft skills (Skills) and other students were assigned to influence and interact with team Knowledge and team Skills (Table 3).

Table 3

Using KSA for Business Model Canvas. KSA into each building block of the Business Model Canvas	
Team Knowledge	• 1. Key Activities • 2. Customer Segments • 3. Value Propositions
Team Skills	• 4. Key Resources • 5. Cost Structure • 6. Channels • 7. Revenue Streams
Team Attitudes:	• 8. Key Partnerships • 9. Customer Relationships

By integrating competency models into each aspect of the Business Model Canvas, engineering professionals can ensure a well-rounded and strategically aligned business plan that not only identifies potential challenges but also leverages strengths to create sustainable value in the marketplace.

6. DISCUSSION AND CONCLUSION

Active learning is crucial in cultivating entrepreneurial skills among students. To

achieve this, university trainers must adopt contemporary pedagogical methods, including active learning, project-based learning, and independent learning. These tools can now be built and ran via custom-built programs, providing a priceless resource for educators to identify effective practices that can be shared among teacher trainers yet easily integrated into everyday classroom routines. The importance of teachers is a pervasive fact in the education literature given that they shape students' experiences and achievement. Reflective teachers make effective decisions on how to teach, changing both their instructional strategies and goals based on conduits or circumstances. Entrepreneurship is a key competence that transcends traditional subjects, requiring an open, experiential, and project-based teaching approach. Instead of simply providing answers, teachers should encourage students to conduct research, ask probing questions, and discover their own paths to solutions. In order to unleash students' potential and to develop an entrepreneurship spirit, it's imperative for teachers to have more quality capability such as creative, innovation and the basis of the entrepreneurial theory. They must also generate a classroom culture that cultivates creativity and encourages students to take responsible risks; where mistakes are seen not as the end, but as necessary opportunities for development and growth. Collaborating with businesses offers a promising strategy for enriching academic curricula and broadening the institution's perspective on the critical competencies that students must acquire—both technical skills and interpersonal abilities—necessary for success in the modern work-force. Such partnerships can provide invaluable insights into industry needs, ultimately enhancing the educational experience and ensuring that students are well-equipped to thrive in their future careers.

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Promovarea mentalității antreprenoriale în educația inginerescă: perspectivele unui studiu de caz privind inițiativele de inovație durabilă

În peisajul economic contemporan, ecosistemul universitar promovează activ competențe ocupaționale relevante în rândul studenților. Aceste competențe contribuie la dezvoltarea comunităților de afaceri din România. Pentru a atinge acest obiectiv, instituțiile de învățământ superior urmăresc să îmbunătățească competențele antreprenoriale ale studenților prin inițiative educaționale specifice. Studiul a inclus 215 participanți, cu vârste cuprinse între 20 și 25 de ani. Această categorie demografică, axată pe tineri adulți, este esențială pentru interpretarea domeniului de aplicare și aplicabilitatea rezultatelor. Respondenții și-au exprimat dorința de a se implica în programe și activități antreprenoriale în sfera academică. Studiul a propus utilizarea unor instrumente și cadre specifice pentru a stabili o nouă direcție strategică, denumită „ocean albastru”, prin crearea unui centru antreprenorial. Acest hub implică părți interesate din Timișoara și oferă ateliere practice de antreprenoriat durabil, cu implicații tangibile în luarea deciziilor. Integrarea abilităților antreprenoriale în mediul de învățare universitar a început odată cu descoperirea instrumentelor de afaceri. Aceste instrumente au facilitat dezvoltarea unor ateliere axate pe îmbunătățirea cunoștințelor, abilităților și atitudinilor antreprenoriale durabile (KSA).

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