




Empowering Student Entrepreneurship Education: The Role of Academic Innovation Incubators

Nikola Radosavljević^{1*}  [0000-0002-9203-4499], Snežana Dragičević¹  [0000-0002-6244-0111] and
Milica Đoković²  [0009-0008-1530-269X]

¹ University of Kragujevac, Faculty of Technical Sciences, Čačak, Republic of Serbia

² Innovation incubator of Faculty of Technical Sciences, Čačak, Republic of Serbia

nikola.radosavljevic@ftn.kg.ac.rs

Abstract: *In today's rapidly evolving landscape of technology and innovation, the role of academic institutions extends beyond traditional education. Universities and faculties are becoming hubs of entrepreneurial activity, fostering cultures of innovation and creativity. Entrepreneurial education, especially at technical faculties, is a driving force for improving the skills needed to launch startups and innovative businesses that lead to the creation of new value, the commercialization of inventions and the creation of new jobs. By the end of 2023, with the support of the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, fourteen innovation incubators have been established at faculties and institutes throughout Serbia. These innovative incubators provide a supportive environment that improves the entrepreneurial potential of students, equipping them with the skills and resources needed to develop innovative ideas and start business ventures. One such incubator is the Innovative incubator of Faculty of Technical Sciences in Čačak, which has shown significant progress in its first six months. This paper explores the importance of academic innovation incubators in empowering student entrepreneurship education, highlighting their role and impact.*

Keywords: *entrepreneurship; entrepreneurship education; innovative incubators; student's startup teams; Innovative incubator of Faculty of Technical Sciences in Čačak;*

1. INTRODUCTION

In a period of crisis and comprehensive economic changes, entrepreneurship emerges as a key driver of the transformation of the current economic system and the creation of conditions for the development of a modern economy. According to Schumpeter, entrepreneurship is viewed from the point of view of entrepreneurs who represent innovators which create conditions for gaining profit by creating temporary monopolies through organizational and technological innovations [1]. Modern economies are marked by process which Schumpeter later defined as "creative destruction" [2]. Today, modern entrepreneurship implies three observations: entrepreneurship as business management, entrepreneurship in the sense of entrepreneurial behavior as opportunistic behavior driven by value and value acquisition, and entrepreneurship as self-employment through business ownership that includes significant elements of risk, management and reward [3]. In developed countries many entrepreneurs founded their companies at universities. Entrepreneurship education is crucial for student entrepreneurs to gain resources and improve knowledge, enhance

their innovative capabilities and skills, and develop an entrepreneurial mindset. Entrepreneurship education encompasses both the development of general competencies and the enhancement of specialized professional skills. By stimulating entrepreneurship and innovation among students at faculties through the activities of newly established innovative incubators, we can have a great impact on our changing society and economy. With an increase of government support, the recent period has shown a slight but encouraging increase in interest in technology and startup entrepreneurship and the commercialization of inventions stemming from academia.

2. ENTREPRENEURSHIP EDUCATION AT ACADEMIC INSTITUTION

While general education focuses on the overall development of students, entrepreneurial education lays on the foundation for the overall improvement of students' entrepreneurial ability. From observation to participation, the social learning network provides multi-level learning channels for student entrepreneurs to continuously improve their skills in learning and practice [4].

Entrepreneurship education can change a student's attitudes toward entrepreneurship by fostering a culture of innovation, skills development and entrepreneurship and reducing environmental uncertainties. It enhances student's perception, enabling them to consistently improve and accumulate new knowledge, which in turn shapes their innovative abilities and personalities.

The two most used terms in this field are *enterprise education* focusing more on personal development and abilities, and *entrepreneurship education* which is defined as education which focus on the specific context of setting up a venture and becoming self-employed. In Sweden and the Balkans, the term *entrepreneurial learning* is used as an equivalent to enterprise education and this sometimes causes confusion since it is the same term used in the research domain of entrepreneurial learning, which is about studying how entrepreneurs learn outside of the educational domain [5].

Entrepreneurship education might enhance the confidence of the students that he will be able to solve new and unexpected problems that could lead to establishing innovative ventures. A supportive environment that promotes entrepreneurship and innovations among students can increase student's motivation and knowledge of entrepreneurship which can help them to start their business venture or to become more suitable on the labor market.

Due to their inherent nature, large organizations like universities are not typically the most entrepreneurial institutions. There are certain barriers that prevent entrepreneurship education from being applied at the required level at universities and colleges. The reasons for it could be [6]:

- The impersonal nature of relationships;
- The hierarchical structure and many levels of approval;
- The need for control and the resultant adherence to rules and procedures;
- The conservatism of the corporate culture;
- The time dimension and the need for immediate results;
- The lack of entrepreneurial talent;
- Inappropriate compensation methods.

Students' perspectives on their entrepreneurship education are closely linked to their views on innovation, entrepreneurship and attitude towards risk, so universities hold the primary responsibility of fostering innovation through entrepreneurship education. There is a positive relationship between the educational processes and technological innovation and development [7].

Cultivating innovative awareness and abilities is key to students' engagement in innovation activities, which are further shaped by their motivation and support given by different institutions. There are important indications that entrepreneurship educational programs positively

influence entrepreneurial goals, enhance the appeal of accessing various resources and connections, and increase participation in entrepreneurship competitions [8].

The motivation of entrepreneurial students could be numerous, but some of the main tendencies can be highlighted [9]:

- The willingness and involvement to be useful for society, to change things, "to make a difference in the world" and to participate in a more sustainable world by answering citizens and end-users needs, especially disabled people or elderly;
- To have a creative and stimulating job;
- Working for themselves, gain financial freedom and earn a living from their passions;
- Create more links and interactions between students and within the communities.

According to Startup Scanner 2024 - comprehensive annual research about innovative entrepreneurship and domestic innovative startup ecosystem in Serbia, 10,4% of startup founders got the idea for launching a startup and gathering a team during their university studies [10].

It should be noted that in Serbia the majority of higher education institutions are to a certain extent engaged in a multitude of different entrepreneurial activities but this does not imply that all these academic institutions can be specifically considered as entrepreneurial institutions. Measuring the quality of entrepreneurial activities at universities against the financial resources generated from such activities, it can be noticed that not all higher education institutions in Serbia are equally successful - entrepreneurial activity depends on the entrepreneurial knowledge, skills and capacities of employees at higher education institutions [11].

3. ACADEMIC INNOVATIVE INCUBATOR'S ROLE IN ENTREPRENEURSHIP EDUCATION

Universities must evolve beyond their traditional roles in teaching and research to actively contribute as creators and disseminators of entrepreneurial knowledge. They should actively contribute as both producers and disseminators of knowledge in entrepreneurial endeavors. The concept of academic innovation incubators is gaining more and more importance. Academic innovative incubator targeted resources and services to support the early-stage ideas of students and entrepreneurs. This approach contrasts with traditional incubation models which support established firms, whether startups or more developed companies. By fostering these business ideas, this pre-incubation and incubation centers can play a crucial role in accelerating the development and success of new ventures among students.

Entrepreneurship can be learned through experience and the sharing of knowledge, yet promoting it is no simple task. Core elements of entrepreneurship — such as searching for new opportunities, building trust and creating networks and projects are often challenging to be properly understood and turned into practical guidelines. Currently, many students aspire to join the "labor market" immediately after graduation. However, adopting an entrepreneurial mindset can improve student's skills and expectations about the future. This change in perspective requires environment that support the development of entrepreneurial thinking and business skill improving [12].

This is where academic innovation incubators can come out as center that is empowering student entrepreneurship education processes, regardless of how multi-faceted they might be. It becomes critically important in the rapidly changing technological landscape of today. Academic innovation incubators narrow the gap between theoretical knowledge and practical application by providing an incubation environment for students to experiment, innovate, and bring their ideas to market. It combines unique values, including team engagement, learning from experience and access to the networks in special industry circles.

The most vital feature of an academic innovation incubator is experiential learning - students are not just the passive recipients of information, they go through high engagement in problem-solving, critical thinking, improving creativity and management of projects. This kind of experience is invaluable, as it prepares them to face the real-world challenges they might face as entrepreneurs. Academic incubators foster the culture of collaboration and teamwork, so students from different backgrounds can work together on developing innovative ideas and bring to team different approach, skills and points of view. This interdisciplinary approach not only enhances the entrepreneur learning experience but also leads to more innovative solutions.

In this way, academic innovation incubators foster better ways to develop and improve a student's entrepreneurial mindset. Students learn to identify opportunities, calculate risks, and fight failures using practical skills which are fundamental requirements for the modern entrepreneurship. The incubators also function as a play-pen for failure, which is a critical element of learning. Students are often encouraged to try out things and learn from their misjudgments without much fear of significant repercussions. That is learning through an iterative process of trial and error, which is critical to innovation.

In addition to the development of technical skills, academic innovation incubators are business sense training centers. Participating in activities such as entrepreneurial courses, workshops, pitch

competitions and startup bootcamps, students are expected to learn market research methodology, develop business models, learn how to manage their finances, talk with customers and intellectual property rights. This approach ensures that students are able to handle the complexity starting and managing business. Also, these activities build an energetic entrepreneurial community that supports and sustains new ventures. Incubators also ensure that students are connected to potential investors, which give them a chance to pitch their ideas that can lead to funding.

Research indicates that innovation incubators support existing teachers, researchers, and academic staff or faculty management. In addition, incubators are agile, and maintain an open-door policy, welcoming participants interested in enterprise education and business creation. Moreover, they foster combined creativity is witnessed as incubators encourage the development of new ideas and the application of courses and programs to real-world settings and industry expectations [13].

Important advantage of academic innovation incubators is to bring the academia and industry closer to each other. They create a symbiotic relationship in which the industry experts will be included to the process of learning and upon whom academia will draw to produce new ideas and research results for the industry.

Another critical factor in the success of incubators is support network, which gives the students a community of peers, mentors, and advisors who can help them with advices, feedback, and encouragement, which might have important role in process of overcoming challenges and uncertainties involved in that entrepreneurial activity. Image and reputation are reflected in academic incubators providing more visibility and credibility to student projects, students entrepreneurs and students startups.

Some studies show that most recognized enabling factors of business incubators are [14]:

- access to industry networks - participants highlights the significance of relationships between business incubators and industry partners, which provide market insights, potential customers, and industry-specific expertise;
- entrepreneurship education - the presence of entrepreneurship education and training programs within incubators was identified as crucial for developing entrepreneurial skills and knowledge among startups;
- flexibility and adaptability - the ability of business incubators to adapt to the changing needs of startups and offer flexible, tailored support was regarded as essential.

In order to overcome the challenges of increasing the entrepreneurial education in Serbia, part of The Education Development Strategy of the Republic of Serbia until 2030 is dedicated to developing and increasing student's entrepreneurial education through the activities and role of innovation incubators. Higher education institutions plan to establish organizational units focused on innovation and technology transfer. These centers will conduct training programs for developing creative thinking and entrepreneurial skills, promote entrepreneurial programs, organize open innovation campaigns with companies, and host bootcamps and competitions for the best student ideas. It will support students in idea development and validation, assist students with using equipment and software in prototype workshops, team mentoring, and facilitate the creation of startups and spinoff companies for commercialization. Additional plan is to increase the participation of content related to entrepreneurship in study programs at faculties [15].

To advance the necessary reforms in entrepreneurship education in Serbia, particularly at faculties that are lacking comprehensive entrepreneurship education programs, fourteen innovation incubators were established at faculties and institutes across Serbia at the end of 2023. This initiative, supported by the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia aims to [16]:

- foster and support the development of entrepreneurial competencies,
- increase the number of startup teams with business ideas,
- boost the number of startups in the earliest stages of development,
- emphasize the provision of training, mentorship, and counseling,
- facilitate their growth and enable smooth entry and success in the market,
- support multidisciplinary and collaboration of scientific research organizations with one or more related scientific research organizations and/or Science and Technology Parks.

Special goals are focused on the development of the entrepreneurial competence, an increase number of startup teams in earlier phases of business idea development, with emphasis on the providing training courses, mentoring and counseling. Establishing innovation incubators is intended to ignite entrepreneurial spirit among youth and enhance the success rate in the early stage of business development. In the first quarter of the current year, 117 activities were held, including training sessions, workshops, and seminars, with the participation of over 900 students, researchers, and professors.

4. INNOVATIVE INCUBATOR OF FACULTY OF TECHNICAL SCIENCES IN ČAČAK

One of the academic incubators established by the end of the 2023 is the Innovative incubator of the Faculty of Technical Sciences in Čačak. As one of the three incubators that were founded at the University of Kragujevac, incubator strives to become driving force for the development of new ideas, to create innovation community and promote entrepreneurship. This incubator, aims to serve as a catalyst for the development of new business ideas, foster an innovation community, and promote entrepreneurship.

The Innovation incubator of the Faculty of Technical Sciences in Čačak helps tech-students to transform their ideas into viable businesses through guidance, resources, and networking opportunities. By fostering a supportive environment, innovation incubators could play a crucial role empowering student entrepreneurship.



Figure 1. Main services of Innovative incubator of Faculty of Technical Sciences in Čačak to support entrepreneurship venture development

The basic elements and activities of the Innovation Incubator, presented at Figure 1, are:

- Innovation infrastructure and equipment – with focus on encouraging development of business ideas, connecting subjects of innovative activities from the academic community and the business sector, providing a knowledge infrastructure and equipped laboratories and facilities;
- Entrepreneurship education and training programs - providing entrepreneurship trainings as well as organizing workshops, bootcamps, courses and seminars aimed to improve entrepreneurial skills of students and faculty staff;
- Mentoring and expert's support – main focus is connecting experienced individuals and experts with startup teams with goal of exchanging knowledge and experience, as well as providing advices in areas such as business idea development, business model development, presentation skills development, market research, marketing, sales and finance, etc.;

- Access to finances - providing information on available sources of funding innovative ideas and organizing events where ideas can be pitched to potential investors, and supporting teams to apply to available calls for idea funding;
- Networking and cooperation with scientific research organizations, companies and innovation centers with goal of knowledge and technology transfers.

The primary role of incubator in entrepreneurship education is expressed through direct entrepreneurship education and training programs, which are among main services provided by the Innovative incubator of Faculty of Technical Sciences in Čačak. During the first half of year 2024 more than 180 tech-students were participants of several activities organized by incubator where they had opportunity to learn more about innovative entrepreneurship and trends in startup world, how to generate startup ideas through problem-solution fit and how to improve their presentation skills.

One of the most prominent events in entrepreneurial education was two-day bootcamp Startup Weekend, held at the end of April 2024. The event was organized by the Innovative Incubator of Faculty of Technical Sciences with support of Digital Serbia Initiative, ICT Hub, PwC, 30Hills, Venture Idea program, USAID Serbia and Science and Technology Park Čačak.

This event brought together 30 students who, over the course of two days, learned about startups and innovative entrepreneurship, teamwork, market research, business model development, digital product development, idea presentation, all through working with experienced mentors from the industry and startup founders. For most of them, this was an opportunity to learn about business development for the first time, and to acquire new skills and abilities that will enable them to turn their ideas into businesses.

It is important to point out that students gained entrepreneurial knowledge and improved their knowledge of entrepreneurship and innovation through intensive teamwork and cooperation with experts, professors and mentors. During mentoring sessions, there is a significant transfer of knowledge and experience, which is crucial in entrepreneurship education for enhancing entrepreneurial knowledge and essential skills.

Through student visits to important institutions such as the Science and Technology Park or fairs such as The International Fair of Techniques and Technical Achievements, students had the opportunity to learn about innovation and entrepreneurship from experienced founders and to increase their motivation to be startup founder or business owner.

5. CONCLUSION

By fostering innovation and entrepreneurial spirit, the role of academic innovation incubators in empowering tech-student entrepreneurship education is crucial for the development of future entrepreneurs. These incubators provide a unique environment where students can learn about entrepreneurship, improve their skills and form their innovative mindset. Through diverse programs, such as bootcamps and mentorship sessions, students gain essential skills in business development, teamwork, and market research.

Academic innovation incubators also play a pivotal role in bridging the gap between academia and industry, promoting interdisciplinary collaboration, and enhancing the commercialization of student's ideas. By providing access to infrastructure, mentorship, and industry networks, incubators help students turn their innovative ideas into viable venture. The collaboration between academic institutions and industry experts within these incubators facilitates a significant transfer of knowledge and experience. This approach not only enhances students' entrepreneurial competencies but also increases their motivation to pursue entrepreneurial careers.

The establishment of innovation incubators at faculties and institutes throughout Serbia, supported by the Ministry of Science, Technological Development and Innovation, underscores the national commitment to entrepreneurship promotion and education. These incubators aim to foster entrepreneurial competencies, increase the number of startup teams, and support the growth of startups in their early stages. The success of these initiatives is evident in the significant participation and engagement of students, researchers, and professors in various training sessions, workshops, and seminars. The Innovation Incubator of the Faculty of Technical Sciences in Čačak showed significant results during the first half of the year, with over 180 students participating in incubator activities to enhance their entrepreneurial knowledge and skills.

Research shows that academic innovation incubators are essential for cultivating an entrepreneurial mindset among students and equipping them with the necessary skills to succeed in the rapidly evolving technological landscape. They are important platforms for experiential learning, fostering innovation, and driving economic development through the creation of new businesses and startups. Therefore, continued support and development of these incubators are crucial for the advancement of entrepreneurship education and the empowerment of the next generation of entrepreneurs.

ACKNOWLEDGEMENTS

This conference paper was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia as part of the Grant No. 451-03-66/2024-03/200132 with University of Kragujevac – Faculty of Technical Sciences Čačak.

REFERENCES

- [1] Schumpeter, J. (1934). *The theory of economic development*. Cambridge, Harvard University Press, USA
- [2] Schumpeter, J. (1942). *Capitalism, Socialism and Democracy*. Harper & Brothers, New York, USA, pg. 81.
- [3] Bešić, C., Čočkalović, D., Đorđević, D. (2023). *Entrepreneurship management*. Faculty of Technical Sciences, University of Kragujevac, Serbia, pg. 16.
- [4] Wei, X., Liu, X., Sha, J. (2019). *How Does the Entrepreneurship Education Influence the Students' Innovation? Testing on the Multiple Mediation Model*. *Frontiers in Psychology*, pg. 2, doi: 10.3389/fpsyg.2019.01557
- [5] Lackeus, M. (2015). *Entrepreneurship in education: what, why, when, how*. Organization for economic co-operation and development, pg. 8.
- [6] Kirby, D.A. (2006). *Creating entrepreneurial universities in the UK: Applying entrepreneurship theory to practice*. *The Journal of technology transfer*, 31 (5), pp. 599-603, doi: 10.1007/s10961-006-9061-4
- [7] Kruss, G., McGrath, S., Petersen, I., Gastrow, M. (2015). *Higher education and economic development: The importance of building technological capabilities*. *International Journal of Educational Development*, pp. 22-31, doi: 10.1016/j.ijedudev.2015.04.011
- [8] Pihie, L., Akmaliah, Z. (2009). *Entrepreneurship as a career choice: An analysis of entrepreneurial self-efficacy and intention of university students*, *European Journal of Social Sciences*, pp. 338-349.
- [9] University of Barcelona (2020). *Report on student entrepreneurship support methods, Transforming open responsible research and innovation through CHARM – Horizon 2020 project - research and innovation program*, European Union
- [10] Digital Serbia Initiative (2024). *Startup scanner 2024*, Digital Serbia Initiative, Belgrade, Serbia
- [11] Benković, S., Milosavljević, M., Spasenić, Ž., Jovanović, A. (2022). *Antecedents of university entrepreneurship: Empirical evidence from Serbian public universities*. *Croatian Journal of education*, Vol. 24, pp. 397-427, doi: 10.15516/cje.v24i2.4324
- [12] Jami, M.Y., Gökdeniz, I. (2020). *The role of universities in the development of entrepreneurship*. *Przedsiębiorczość – Edukacja [Entrepreneurship – Education]*, pp. 85-94. doi: 10.24917/20833296.161.7
- [13] Crammond, R. (2023). *Entrenching the enterprise message through innovative incubators: Asserting pedagogical principles towards assisted academic practice*, *Journal of perspectives in applied academic practice*, pp. 111-123, doi: 10.56433/jpaap.v11i3.591
- [14] Rukmana, A., Meltareza, R., Harto, B., Komalasari, O., Harnani, N. (2023). *Optimizing the role of business incubators in higher education: A review of supporting factors and barriers*, *West science business and management*, pp. 169-175, doi: 10.58812/wsbm.v1i03.96
- [15] Official Gazette of the Republic of Serbia, *The education development strategy of the Republic of Serbia until 2030*, Official Gazette of the Republic of Serbia No. 63/21
- [16] Ministry of Science, Technological Development and Innovation (2023). *Program for the formation and development of innovation incubators in scientific and research organizations in the Republic of Serbia*. Belgrade, Serbia