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CHAPTER 42

THE INFLUENCE OF ICT TECHNOLOGIES ON HIGH ENTREPRENEURSHIP EDUCATION IN THE PANDEMIC ERA

Abstract: In addition to the large educational losses during the pandemic, the time of such a crisis can be seen as an opportunity for innovation in the traditional school model, which motivated the authors to further explore this area. The objective of the paper is to research the influence of ICT technologies on entrepreneurship learning in higher education in Serbia during the pandemic era. Based on the literature, the authors defined the theoretical research model to study the significance of the relations between the three independent variables: ICT infrastructure (ICTI), ICT competent lecturers (ICTL), curricular and digital competencies of the faculty or college (C&DC), and entrepreneurship education of the faculty or college (EE) as dependent variables. Empirical research was conducted on a sample of 328 students from accredited degree programs (as of the 2019/2020 school year) in the context of entrepreneurship education at universities, colleges, and high vocational and academic schools in Serbia at the end of 2022. Students participating in an anonymous online survey were asked to express their opinions on 12 defined statements within the research variables. The research results obtained through regression analysis confirm the high importance of ICT infrastructure and resources for university entrepreneurship learning during the epidemic and the supporting impact on its growth. The availability of digital devices for distance entrepreneurship learning, the

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connectivity of the institutions and students, prior educational experience, teacher capability, and program quality are among the factors to be evaluated in the design of distance education programs. The paper could therefore contribute to a more inclusive, efficient, and resilient design of educational systems, monitoring of processes and learning outcomes, literature on entrepreneurial learning, students' knowledge of digital technologies, and the development of their ICT skills.

Keywords: higher education, Serbia, ICT technologies, entrepreneurship education, pandemic.

INTRODUCTION

The COVID-19 coronavirus pandemic affected many areas of life and work, bringing losses that were extremely significant in the field of education. The authors of the paper aimed to examine university students' opinions concerning ICT technology's impact on entrepreneurship learning in higher education in the era of the pandemic by assessing the influence of ICT facilities and infrastructure, lecturers' competencies, and curriculum contents. A moderating role of ICT technologies is assessed through students' valuation of three groups of factors: the availability and quality of ICT infrastructure and human resources, as well as the content of curricula and skills and their impact on higher educational institutions. The availability of ICT resources includes devices and tools such as printers, scanners, photocopiers, wireless fidelity (Wi-Fi), local area networks (LAN), active Internet bundles, routers, switches, bridges, firewalls, memory cards and pen drives, school website hosting, CD/DVD ROM drives, a school digital database manager, and external hard drives in the two universities studied. Besides, only laptops and desktop computers, software licenses, projectors, and school social media platforms and forums were available. This empirical evaluation of e-learning infrastructure, resources, and curricula of faculty and colleges should contribute to the level of engagement of lecturers and education institutions with their students in the provision of adequate learning content through new technologies during the COVID-19 era in favor of entrepreneurship education. Because of that, competent lectures teaching entrepreneurship are defined as an independent variable that might influence entrepreneurship learning in higher education during pandemic time. Factors indicating a significant impact of ICT deployment by academic staff in universities and colleges are based on their computer literacy level in the COVID-19 era, but entrepreneurship approaches curricula and skills. The pedagogical problem is that more systematic and psychologically focused entrepreneurial competencies are better favored than the traditional approach. Entrepreneurial skills can be acquired through pragmatic development projects. The third factor within technology's impact on entrepreneurial education

explored in the empirical part of this research was the perceived effectiveness of content and curriculum adjustments. Adjustments should not only focus on curricular competencies that are examinable and important to fulfill short-term objectives but also those that were relevant in the situation of the pandemic, such as self-directed learning, caring for oneself and others, social-emotional skills, and competencies that were critical for mid- and long-term learning objectives.

High education is selected for the relevant institutional framework for the empirical study, as universities are very important in providing entrepreneurship skills in the learning process. High school and university students face challenges in their quest to attain or achieve entrepreneurship education. The study upholds that undergraduate students, in their determination to embrace the entrepreneurship education concept, do face challenges despite the huge benefits derivable from being students of a number of entrepreneurial programs or subjects (Islam et al. 2020).

Technology has the power to transform teaching by ushering in a new model of connected teaching. This model links teachers to their students and to professional content, resources, and systems to help them improve their own instruction and personalize learning. Multimodal remote learning solutions were proposed by educational institutions to be effective in increasing engagement in remote learning (World Bank, 2020). But according to Aleksić (2019), the impact of ICT on learning outcomes and thus on student performance depends not only on the frequency of usage at school but also on the quality of teaching because, despite the significant affordances that digital technologies and devices may bring to classrooms, they can enhance the learning process but cannot replace poor teaching. In the educational institutions' response to the pandemic, there were many challenges, ranging from inadequate knowledge, expertise, non-learning experience and ICT capacity, ICT literacy levels, and ICT deployment.

Other studies (Gorman, Hanlon & King 1997) have shown the belief and misconception that entrepreneurship education is reserved for dull students who never did well in school. They further maintained that such an erroneous misconception has deprived gifted boys and girls who would have excelled in building entrepreneurship and tapping the benefits of embracing this all-important innovation in the education industry. The skepticism around entrepreneurship being an inherent trait (entrepreneurs are born, not made) has increased the negative attitude toward the development of entrepreneurship pedagogy. For the empirical research of this paper, Serbia was chosen as the authors aim to contribute to the literature on entrepreneurship learning in the country during the pandemic, helped by ICT infrastructure. Many authors from Serbia contributed to the literature on COVID-10 concerning e-learning materials (Kovač Cerović et al. 2021; Marković Krstić & Milošević Radulović 2021; Novković Cvetković, Stanojević & Milanović 2020; Randelović, Stanojević & Minić 2019; Randelović et al. 2020; 2022; Mandić & Mandić 2013).

There are further types of higher education institutions (HEIs): Universities (private and state), colleges of academic studies (B&M), and academies of applied studies (which integrate several vocational study colleges) (Table 1)

Table 1: Tertiary education in Serbia, 2019-2022.

Year	High schools and universities	Enrolled students		Teaching staff
		Total	Female	Total
2019/20	184	241 968	137 910	11 823
2020/21	164	242 550	139 427	12 429
2021/22	168	243 952	141 371	12 626
	State universities	82	174836	105096
	Private universities	51	30444	15871
	State higher schools (colleges) /Academies of applied studies	20	32533	17322
	Private higher schools (colleges)	15	6139	3082

Source: Authors, according to the SOS, 2023

There was a share of highly educated people in Serbia (aged 25–34) during the COVID-19 era (2020) of 32.6%. Two years before (2015), there were 29.8%, and in 2021, the share of highly educated people was higher, 33.9%. The European average (2021) was 41.2%. (SOS, 2023).

The pivot of the Serbian economy towards the EU and its focus on improving education have contributed to its increased engagement in international educational activities, generating a rich knowledge base about education in the country. The Small Business Act for Europe, over the period 2019–21, establishes comprehensive monitoring and evaluation of all programs related to entrepreneurial learning and skills. A high-quality and coordinated approach to monitoring and evaluation is needed to measure progress towards the impacts outlined in the linked strategy documents. According to SME Policy Index data (2022), the weighted average for entrepreneurial learning (in planning and design, implementation monitoring, and evaluation) in Serbia was 3.72. With limited progress made in government policy actions for lifelong entrepreneurial learning and development of the entrepreneurship key competence in pre-service teacher training courses and moderate progress made in developing key competencies, however, schools and teachers undoubtedly need proper resources to educate students in the field of entrepreneurship. It was evident that simply providing ICT resources, as well as defining aims in strategy documents during the pandemic era, was not enough for student learning improvement. Many authors attribute the relevance of the resources to schools' needs, and school staff need to have the capacity to use those resources. (Pont, Nusche, and

Moorman 2008; Maghnouj 2020; OECD, 2019). As a part of a strategic approach to education in crisis, several strategic documents were adopted by the Serbian Government: Strategy by 2030 with an action plan in 2021; The Strategy on Scientific and Technological Development 2021 with lifelong learning promotion; Smart Specialization Strategy (2020-2027); and Industrial Policy Strategy (2021-2030). Serbia's COVID-19 recovery program included support measures throughout the pandemic: Subsidies, tax measures (April 2020), monetary measures, and credit support for educational institutions

As the virus of COVID-19 began to spread in the first months of 2020, the Serbian government organized distance learning as the dominant teaching model in the country (Imel, 1998:3), with digital ways of teaching. The process was organized under deficient technological infrastructure (OECD, 2019) and digital resource shortages (Mandic & Mandi 2013; Bates 1995; Moore et al. 2011). Remot learning in Serbia in 2020 was based on the national digital platform, helped by all national TV. There were 51.8% of citizens connected to the Internet, 90.7% with mobile technology access, 98.7% with TV learning program access, 77.7% with radio access, and social media and TV program access (World Bank 2020a; Randjelovic et al. 2020; Novkovic Cvetkovic et al. 2020).

The way educational institutions deliver teaching and learning opportunities during a pandemic can contribute to the achievement of not only educational goals but also broader development goals, such as entrepreneurship, social cohesion, and participatory citizenship. Serbia needs graduates who can possess entrepreneurial traits, which are to be realized through the education system by providing entrepreneurial education that can drive economic development, new employment, innovative ideas, and new sector development, such as technology entrepreneurship (90% of owners in the very propulsive ICT sector in Serbia are entrepreneurs in micro and small companies; the same is true in tourism and hospitality). This could be achieved by engaging in several activities, such as: engaging in entrepreneurship advocacy, campaigns, and enlightenment programs to provide information about entrepreneurship and encourage students to consider entrepreneurship as a career; allowing university governance to create centers of entrepreneurship and innovation, equipping these centers, and even extending the service by providing short courses to youths in collaboration with the job creation offices (a good experience of the Faculty of Technical Sciences in Novi Sad); and employing skilled professionals in entrepreneurship in the universities to run workshops and seminars on the apprenticeship concept.

The paper is structured so that after the summarized key reasons, motivations, and findings given in the abstract and the general approach to the topic given in the introduction, are presented literature sources concerning ICT technologies, distance learning, and the phenomenon of entrepreneurship learning. Empirical

research is given through materials and methods used, final results, similar findings of other authors, and a conclusion with references used at the end of the paper. The paper is structured so that after the abstract and introduction with the purpose of the resources and sources of evidence, a literature review is given. The findings of the empirical research, its limitations, previous studies whose findings corroborate them, the conclusion, and references on which the elaboration of the paper is based are given at the end of the work.

LITERATURE REVIEW

ICT technologies, digital devices, tools, and infrastructure are very important for education, knowledge, and digital skills development, as well as the pedagogical capabilities of the learners. Figure 1 illustrates the use of ICT technologies.

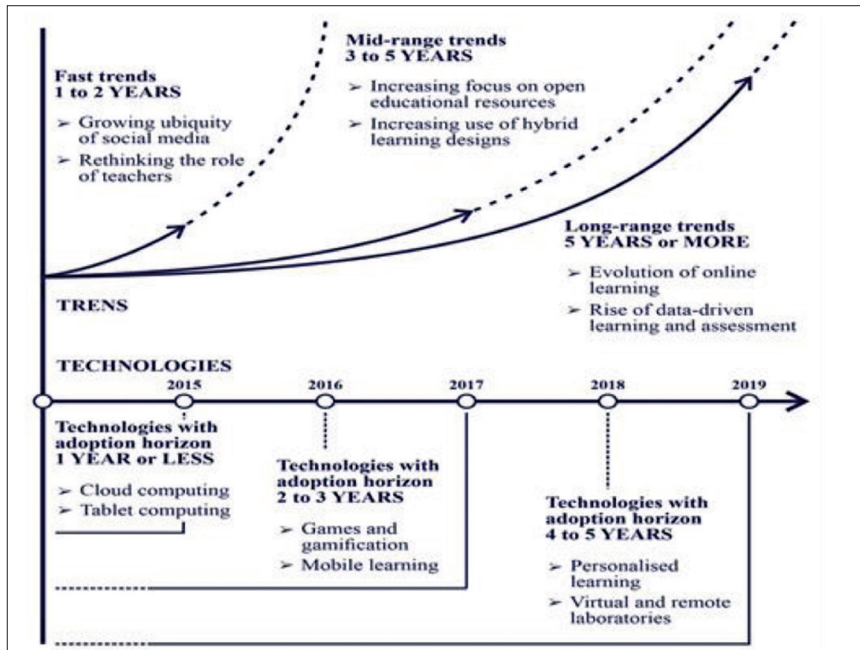


Figure 1. Technologies in Education

Source: Authors, based on the literature

Digital skills, competencies, and infrastructure were crucial in the realization of education programs in the pandemic era (Hamida et al. 2017). In Digital Competence (DigComp), knowledge of information technologies, skills, and attitudes can be seen as the main components (F. 2).

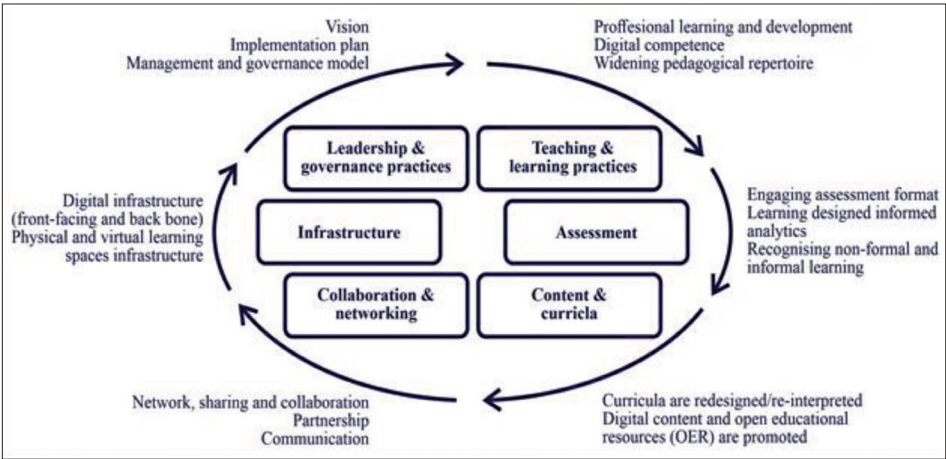


Figure 2. Cross-Cutting Elements of the DigcompOrg Framework

Source: Authors, according to the literature

As a form of online education, we understand distance learning, where lectures and learning materials are made accessible through the internet or televised programs of public broadcasters (Moore et al. 2011:3; Butcher & Wilson-Strydom 2008: 725-746). The learning supported by ICT is not limited to ‘digital literacy’ and may include any other electronic or interactive media(electronic sources) (F. 3)

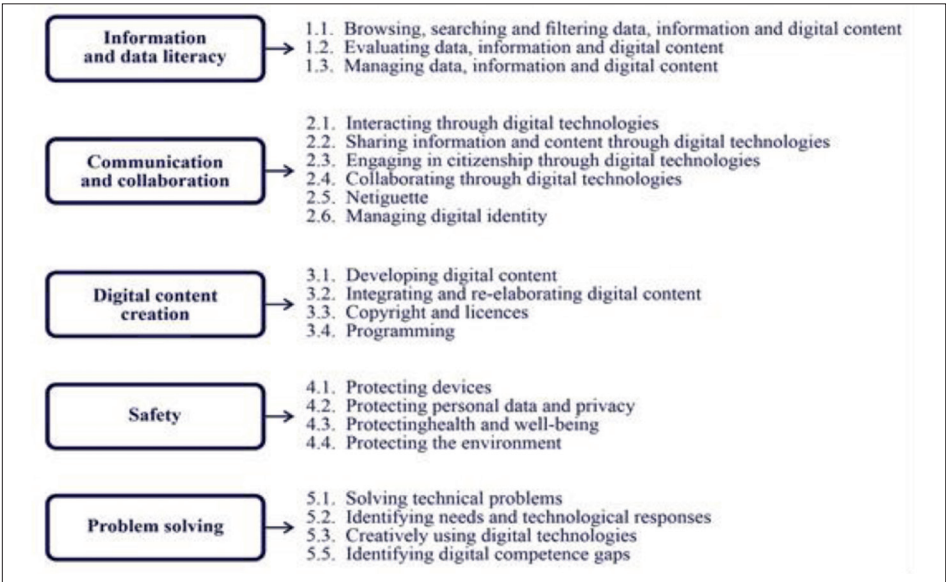


Figure 3: Entrepreneurial Education Research Model

Source: Author, according to Jardim 2021.

Entrepreneurship education. The works of Cheng et al. (2009), Jack and Anderson (1999), and Henry et al. (2005) mention that entrepreneurship education (EE) has since the mid-1990s become an emergence of the new economic direction (Venter et al. 2015). The concept (Shepherd & Douglas 1997, cited by Solomon 2007) concerns the ability to envision and chart a course for a new business venture by combining knowledge and entrepreneurial competencies from the *functional disciplines and from the external environment in the context of the extraordinary uncertainty and ambiguity that face a new business venture* (F.4).

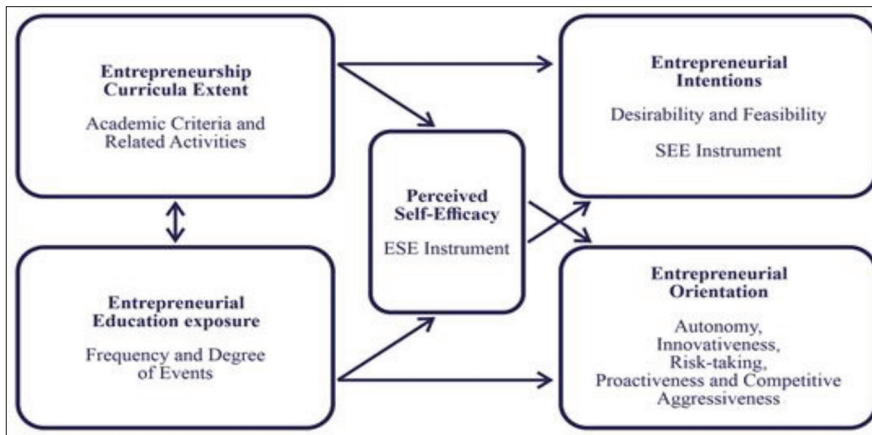


Figure 4: Entrepreneurial Education Research Model

Source: Author, according to Jardim 2021.

The major theme in entrepreneurship education is risk and how entrepreneurs are inclined towards risky alternatives or how they should manage risk in the course of being innovative or creative (Mithelmore & Rowley, 2010). Several studies have indicated that university-based entrepreneurship education aims at infusing the entrepreneurial culture and spirit of the students and developing new skilled entrepreneurs and new businesses based on science and technology. In other words, the outcome is that well-educated entrepreneurs create jobs, and entrepreneurial training still has a series of challenges facing entrepreneurship education. According to Oosterbeek et al. (2010), the entrepreneurship programs of higher institutions do not provide adequate real-life skills that will enable the students to become useful members of society because such programs often fail to provide the students with enough opportunities for self-development. However, other authors, such as Packham et al. (2010), have a different opinion that students increase their knowledge in entrepreneurship education in terms of skills, know-how, and a better entrepreneurial attitude. The study findings could support the institutional aspects of promoting entrepreneurship by introducing new content, programs, or

just courses and using conventional teaching methods that lag behind the positive correction between teachers' competencies to match the international standard on students' performance in the process of enhancing their theoretical and business knowledge and skills. Entrepreneurial learning raises students' skills as learners. It develops the mindset needed to change their lives and the world around them. It can empower teachers to generate the creative ideas students need for 21st-century development. Entrepreneurship development through education can be better understood through the variety of audience objectives, the content of entrepreneurship courses, pedagogies, and assessment methods where the educational goals depend on the learning audience (Alberti et al. 2004), the entrepreneurship program, and all other aspects (Henry et al. 2005) (F.5)

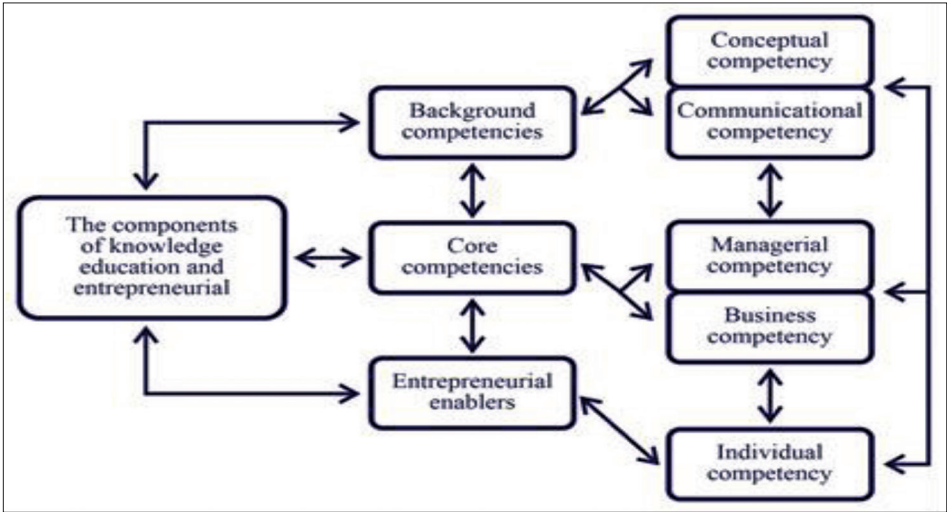


Figure 5: Proposed conceptual model of EE (humanities scientific field)

Source: Authors, based on literature

Entrepreneurship education at universities can have a positive influence on attitudes toward entrepreneurship, which in turn can promote entrepreneurship as a useful and respectable career prospect for graduates (Galloway & Brown 2002; Petridou et al. 2009; Matlay 2006; Volkmann et al. 2009). One of the major challenges for entrepreneurship education is developing *competencies and equipping students with the right skills* (Abubakar 2010; Ayomike 2013) to better achieve wealth creation for students (Covin & Wales 2012). For countries like Serbia, there are even more challenges, among which are important: Leveraging institutional capacities and cross-country collaboration to effectively scale up a remote learning program with inclusive multimodal delivery systems build sustained institutional capacities

in the fields of innovation and technology and create multi-stakeholder collaborative environments that enable innovation and entrepreneurship in education, and the way teachers could be supported to develop bottom-up community-based programs for learning in other contexts, students gained autonomy and discovered new ways of learning. As education is a social experience, learning occurs when teachers interact with and provide effective feedback to students.

MATERIALS AND METHODS

The empirical research results on university students' opinions on ICT technology, the human resources of the universities and colleges, and curricula adjustment's possible influence on entrepreneurship education in the time of the pandemic in Serbia are shown in this section. There were four variables defined to form the theoretical model: three independent variables:

1. ICT infrastructure of the faculty or college (ICTI),
2. ICT-competent lecturers of the faculty or college (ICTL) and
3. Curriculum and digital competencies of the faculty and college (C&DC), and
4. One dependent variable is the entrepreneurial education of the faculty or college (EE) (Figure 6).

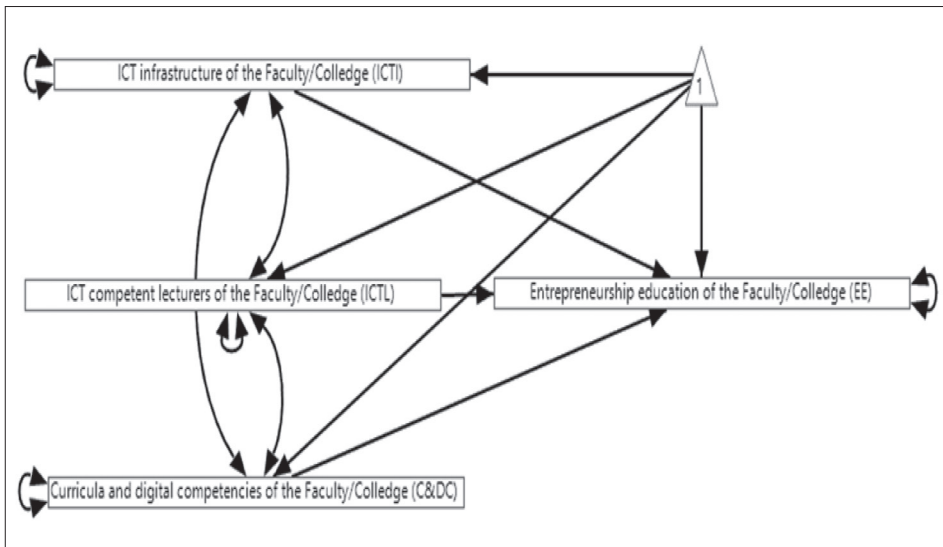


Figure 6: The theoretical model

Basing the theoretical framework on entrepreneurial principles, values, and capabilities, the research emphasizes the relationship between the uses of ICT technologies by universities and colleges in entrepreneurship learning programs. Following their initial model, the variables include 12 items (in the form of claims) in total, namely as follows:

Independent variables	
	1. Variable: ICT infrastructure of the faculty or college (.ICTI), claims::
1	1.1. There are ICT facilities and devices that exist, ensuring integration into the learning practices of teachers and students (ICTI1).)
2	1.2. Digital technology learning tools support innovative teaching practices in entrepreneurship education (ICTI2).
3	1.3. Offering students ICT technology tools to encourage their entrepreneurial abilities (ICTI3)
	2. Variable: ICT competent lecturers of the faculty or college (ICTL), claims:
4	2.1 Competent lecturers handle digital entrepreneurial courses (ICTL1).
5	2.2 Lecturers support the curriculum realization, favoring knowledge acquisition as well as applied and practical skills (ICTL2).
6	2.3 The new role of the lecturer in students' entrepreneurial competence development is reinforced (ICTL 3).
	3. Variable: Curriculum and digital competencies of the Faculty/College (C&DC), claims:
7	3.1 The combination of a cross-curricular approach and real-world entrepreneurial experience helps formalize entrepreneurial learning content (C&DC1).
8	3.2 The level of ICT usage and resources supports upgrading curricula for university entrepreneurship education (C&DC2).
9	3.3 The approach to digital learning is described in the curriculum documents across the subjects of entrepreneurship among expected learning outcomes (C&DC3).
Dependent variable	
	4. Entrepreneurship education of the faculty or college (EE), claims
10	4.1 At the core of entrepreneurship learning are skills, competencies, and the cultivation of talents (EE1).
11	4.2 Through entrepreneurship education, university students acquire the knowledge to combine seeing and seizing opportunities and creating value, which can entail innovation (EE2).
12	4.3 Studying entrepreneurship enhances students' analytical and logical skills, enabling them to solve any problem (EE3).

For the purpose of this research, the ethical commission is composed of university professors of EE, ICT professionals, and representatives of the National Chamber of Commerce, with the aim of approving a sample of the research and a questionnaire with statements to gather students' opinions. To design the research

sample and the anonymous way of students' opinions under ethical principles, an ethical commission of university professors of ICT and EE was composed. There were empirical online questionnaires provided in Serbia in the last quarter of 2022. Students' assessments of the impact of using ICT technologies and resources during the coronavirus on entrepreneurship learning were anonymous. A sampling procedure selected a sample of students from high education organizations, faculties, and colleges in their final year of studies. From the total number of 400 questionnaires provided to the students, 328 were accepted to be involved in the survey and answered, so the response rate was 82.00%. These sample characteristics take into account students attending the EE studying programs as well as the programs of management and business accredited in Serbia in the 2019/2020 school year.

The methods used for the research statistics elaboration are correlation and regression analysis. The data were processed in JMP Pro 16 statistical software. A Likert scale of five points has been employed (Sullivan and Artino Jr., 2013). The questions in the form of claims are answered according to the scale frequency: 5—I completely agree (the highest score); 4—I agree partially; 3—I do not agree; 2—I partially disagree, and 1—I do not agree at all. 5 is the highest level of respondents' satisfaction with the proposed claim.

Based on the literature and projected theoretical system model, the task of the study was to examine whether the ICT infrastructure of the faculty/college (ICTI), ICT-competent lecturers of the faculty/college (ICTL), and curricula and digital competencies of the faculty/college (C&DC) do not impact or impact the entrepreneurship education of the faculty/college (EE). The next two hypotheses were defined:

- H0: Entrepreneurship education of the faculty or college (EE) is not affected by the ICT infrastructure, ICT-competent lecturers, or curricula and competencies of the faculty or college (C&DC).
- H1: Entrepreneurship education of the faculty or college (EE) is not affected by the ICT infrastructure, ICT-competent lecturers, or curricula and competencies of the faculty or college (C&DC).

Correlation and regression analysis

The highest mean value of 3.9969512 is found for the statement (EE1). The statement (C&DC1) had the highest standard deviation of 1.1760417. The smallest mean value of 3.6737804 has the statement (ICTI1). The smallest standard deviation of 0.9472355 has the statement (ICTI2). The results for values, standard deviation, and mean value are presented in Table 2.

Table 2. Descriptive statistics for statements made

No	Statements	Mean	Std Dev
1	There are ICT facilities and devices that exist, ensuring integration into the learning practices of teachers and students (ICTI1).	3.6737804	1.0347103
2	Digital technology learning tools support innovative teaching practices in entrepreneurship education (ICTI 2).	3.9573171	0.9472355
3	Offering students ICT technology tools to encourage their entrepreneurial abilities (ICTI3)	3.8780488	1.1103102
4	Competent lecturers handle digital entrepreneurial courses (ICTL1).	3.8445121	0.9336884
5	Lecturers support curriculum realization, favoring knowledge acquisition as well as applied and practical skills (ICTL 2).	3.7408536	0.9814371
6	The new role of the lecturer in students' entrepreneurial competence development is reinforced (ICTL 3).	3.9268293	0.9191205
7	The combination of a cross-curricular approach and real-world entrepreneurial experience helps formalize entrepreneurial learning content (C&DC1).	3.8567073	1.1760417
8	The level of ICT usage and resources supports upgrading curricula for university entrepreneurship education (C&DC2).	3.9146341	1.1164734
9	The approach to digital learning is described in the curriculum documents across the subjects of entrepreneurship among expected learning outcomes (C&DC3).	3.7469512	1.1756928
10	At the core of entrepreneurship learning are skills, competencies, and the cultivation of talents (EE1).	3.9969512	0.9689316
11	Through entrepreneurship education, university students acquire the knowledge to combine seeing and seizing opportunities and creating value, which can entail innovation (EE2).	3.8140243	1.0603436
12	Studying entrepreneurship enhances students' analytical and logical skills, enabling them to solve any problem (EE3).	3.8963414	1.147361

The mean value and standard deviation for the variables are given in Table 3. According to the results, 3.9024390 is the highest mean value for the variable (EE). The highest value of the standard deviation of 0.9868125 is a variable (C&DC). The smallest value for a mean value of 3.8363821 has the variable (ICTI), and the variable (ICTL) has the smallest value of the standard deviation of 0.8531191.

Table 3. Variable values

Variable	Mean	Std Dev
Dependent		
1. ICT infrastructure of the faculty or college (ICTI)	3.8363821	0.9496271
2. ICT-competent lecturers of the faculty or college (ICTL)	3.8373984	0.8531191
3. Curriculum and digital competencies of the faculty and college (C&DC)	3.8394309	0.9868125
Independent		
1. Entrepreneurship education of the faculty or college (EE)	3.9024390	0.7105588

KEY FINDINGS AND DISCUSSION

The value of the multiple coefficients of determination is 0.811. On the basis of the coefficient, a dependent variable, entrepreneurship education (EE), can be defined as 81.10% by the variables (ISCTI), (ICTL), and (C&DC). The multiple correlation coefficient is 0.657, and it is moderately strong and positive. The highest influence on the dependent variable (EE) is the independent variable (ICTI), with an impact of 0.582025. Still a strong influence, but a lower one on a dependent variable (EE) is found for (ICTL) of 0.412716. The variable with the lowest influence of 0.24618 on the dependent variable (EE) has the variable (C&DC). The standard contributions of the set-theoretical model are presented in Figure 7.

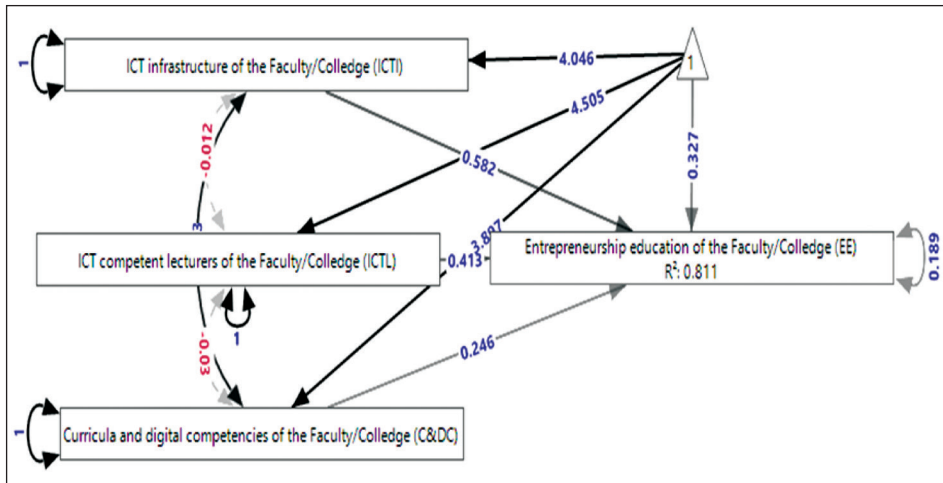


Figure 7. Contribution sizes of the standard theoretical model

The score for statistical significance, which amounted to $[F(3,324) = 4463.5053, p < 0.0001]$, is presented in Table 4. Hypothesis H1 can be confirmed:

- H1: The ICT infrastructure of the faculty or college (ICTI), ICT-competent lecturers of the faculty or college (ICTL), curriculum, and digital competencies of the faculty or college (C&DC) influence the entrep
- reneurial education of the faculty or college (EE).

Table 4. ANOVA

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	133.90051	44.6335	463.5053
Error	324	31.19976	0.0963	Prob > F
C. Total	327	165.10027		<0.0001

The set-theoretical model non-standard contributions are presented in Figure 8. For the variable (C&DC), the mean value of the independent variables is the highest and is 3.839; for the variable (ICTL), 3.837 is the mean value. The lowest mean value is 3.836, or the variable (ICTI). 0.971 is the largest value for the variance, and it is for the variable (C&DC), then for the variable (ICTI), and is 0.899. 0.726 is the smallest value for the variance, and it is for the variable (ICTL). Between the independent variables (ICTI) and (C&DC), there is the highest covariance, which is 0.883.

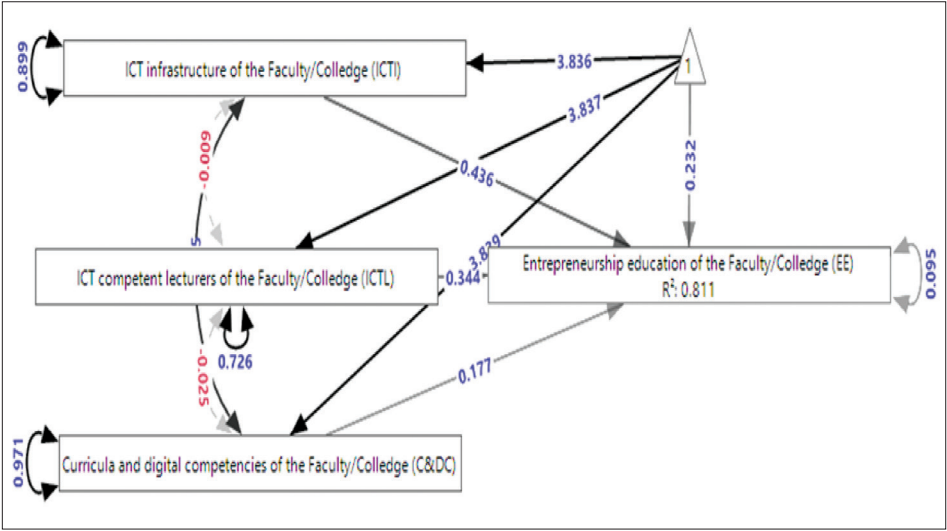


Figure 8. The theoretical model's non-standard contributions

Based on the data shown in Figure 9, a multiple equation regression (1 and 2) formula can be defined. It is shown in Figure 4, which reads:

$$y = 0.2320018 + 0.4355006 \cdot x_1 + 0.3437489 \cdot x_2 + 0.177263 \cdot x_3 \quad (1)$$

or

$$(EE) = 0.2320018 + 0.4355006 \cdot (ICTI) + 0.3437489 \cdot (ICTL) + 0.177263 \cdot (C\&DC) \quad (2)$$

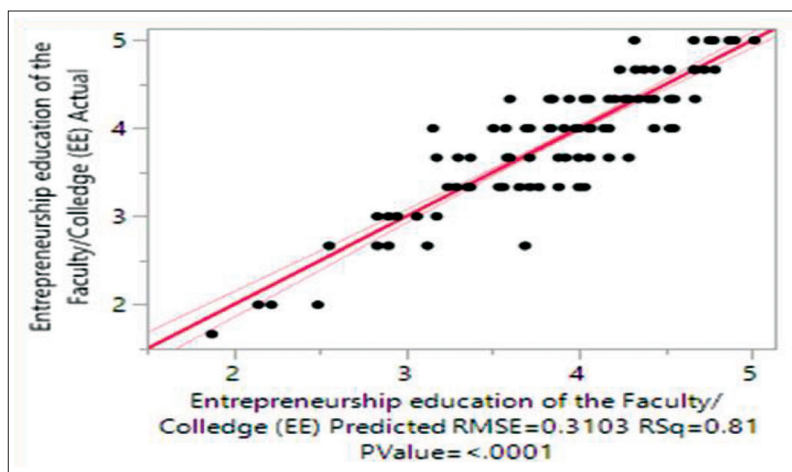


Figure 9. Diagram of the multiple regression equation

From the multiple regression equation, it can be seen that H1 is supported, but H0 is not confirmed. It can be concluded that as the ICT infrastructure of the faculty or college (ICTI), ICT-competent lecturers of the faculty or college (ICTL), and digital competencies of the faculty or college (C&DC) grow, so does the entrepreneurship education of the faculty or college (EE). This indicates a positive correlation between the use of ICT technology, competent teachers, and curriculum and digital competencies in higher education and the entrepreneurial learning of accredited study programs or within other programs of social sciences in which an empirical study of student attitudes about their impact during the coronavirus was carried out.

Findings from similar studies

This research corroborates several previous studies (Owan et al. 2020) as well as other studies approaching entrepreneurship education as a major challenge (Ubong 2017), pointing out that it appears to be the focus of entrepreneurial education in Serbian higher education institutions, private or public. Supporting the results of this research, Ustyuzhina, Mikhaylova, and Abdimomynova (2019)

found findings on the role of competent human resources within higher educational institutions in competency acquisition, along with the provision of a conducive environment that will foster the entrepreneurial learning of the students. Many studies indicate a positive relationship between technology and entrepreneurship education. Abou-Warda (2016), in his paper “New Educational Services Development: Framework for Technology Entrepreneurship Education at Universities in Egypt”, finds positive connections between ICT technology and EE methods (Blenker et al. 2014), technology and curriculum, and lecturer competency in EE provision (Iwu et al. 2021).

Several researchers have found that there is a significant correlation between EE and entrepreneurial intention (EI). Harima et al. (2021), Peterman and Kennedy (2003), Sowmya et al. (2010), Krichen and Chaabouni (2021), and Jevtic et al. (2017) find that perceived educational support positively affects entrepreneurial activities during the pandemic.

The hypothesis H1 has confirmed in the research on the positive relationship between ICT technologies and entrepreneurship education can be further supported by the findings of other studies on a similar research issue (Botsaris and Vamvaka 2016; Godwin et al. 2016; Denanyoh et al. 2015; Mahendra et al. 2017; Srebro et al. 2021; 2023).

Limitations of the study

The limitations of the study can be seen in not including the lecturers' opinions in the research objectives, as well as in opportunities to compare the results with the coming period and the performance of students changing during online education. These questions are part of the debate in the literature (Said 2021; Gonzalez et al. 2020), so some of these issues may be part of further empirical research.

CONCLUSION

To explore by qualitative and empirical methods the possible influence of ICT infrastructure and human resources, lecturers, as well as curriculum and digital competencies toward entrepreneurial learning in higher education in Serbia through student opinion assessment within the crisis framework of a pandemic, is the research aim realized through this study. The findings confirmed the importance of the ICT infrastructure and resources for the university entrepreneurship learning program provided by digital channels and infrastructure, as well as supporting the new issues to be examined. To ensure learning continuity, prior experience with the distance learning programs and delivery system during the pandemic is critical for the rapid implementation of existing institutional solutions

in a crisis situation. The usage of delivery systems for education as a demand side has to be monitored by the institution, often in times of crisis. The activities of entrepreneurship study programs increase the learning outcomes, so contextual factors have to be more often evaluated when designing and deploying remote education programs for entrepreneurship. The lecturer's preparedness and capacity and their digital competency development play an important role in the impact of digital skills on entrepreneurial learning. In terms of curriculum context and capability improvement, it can be recommended to secure teacher training, in-service support, and remote coaching programs for entrepreneurship. Both lecturers and entrepreneurship study programs, as part of the supply side of designing and implementing online programs in entrepreneurship, have become even more important during and after the pandemic crisis.

One of the significant findings of the research concerns the effectiveness of remote learning by ensuring adjustments to the curriculum of entrepreneurship education. Adjustments to entrepreneurship learning programs in higher education should focus on academic competencies as well as on practices and experiences. In Serbian high educational institutions and lecturers' practices, both private and public, permanent formative and summative assessments are still missing. What can be seen as the barrier to institutional decision-making on adjustments to capacities and process consolidation? As students' opinions are surveyed in public and private universities and colleges, the results can be considered diverse. Besides the education loss in the crisis era, that period can also be seen as an opportunity for the traditional school model and contents of entrepreneurship, learning innovation, and creativity support of the students. The paper, therefore, could contribute to more inclusive, efficient, and resilient education system building, monitoring processes, and learning outcomes, as well as to the entrepreneurial learning literature from the SEE region and to students' digital competencies and knowledge development.

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