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EXPLORING STUDENT SATISFACTION WITH ONLINE EDUCATION DURING THE COVID-19 PANDEMIC IN ROMANIA: A LOGISTIC REGRESSION APPROACH

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ABSTRACT**. **This research investigates the factors influencing student satisfaction with online education (SSOE) in higher education (HE) in Romania during the COVID-19 pandemic. Developing on the extant literature on SSOE antecedents, this study used a sample of 446 business students and employed factor analysis to obtain four groups of influencers to be regressed with descriptive variables to assess their impact on SSOE. Lack of intercommunication and lack of self-reliance were the strongest influencers, followed by assistance from academic and non-academic staff, and online syllabus. Online platform functionality and online class attendance had a significant impact on SSOE. The study expands the literature through the tested model, including as explanatory factors both educational constructs and descriptive variables. Managerial recommendations are provided on staff training and syllabus amending. The model can be expanded by including age and student's Internet accessing equipment type for online education and differentiating between public and private HE institutions.

KEYWORDS: student satisfaction, online education, COVID-19 pandemic, business students, principal component analysis (PCA), logistic regression, Romania.

JEL classification: I23, M31, C51, C53.

Introduction

Student satisfaction looks like a simple answer with positive versus negative options to a question referring to the actual performance of any aspect related to education, having as a baseline the meeting or exceeding of students' expectations (Elliott, Healy, 2001). Despite this apparent simplicity, student satisfaction is a constant researched issue, covering inside and outside higher education aspects (Santini *et al.*, 2017). Student satisfaction is investigated in connection with the way the educational system is built and organised, the degree to which it fulfils its obligation towards stakeholders, or the way the educational system interacts with society (Jereb *et al.*, 2018).

Among interests in investigating student satisfaction, satisfaction with online education gains more and more attention (Parahoo *et al.*, 2016). As technology advances quicker than ever, and the internet brings people and things closer, higher education (HE) institutions respond by innovating the instruments and ways for delivering education. Online education developed tremendously at the university level, although unequally between countries, the number of courses and programmes increasing constantly rendering as an effect a significant growth of the number of attending students (Parahoo *et al.*, 2016). Online

education appears as an inclusive concept, referring to e-learning, online learning, virtual learning, distance learning, online collaborative learning, web-based learning, or technology-mediated learning (Ali, Ahmad, 2011; Arkorful, Abaidoo, 2015). Regardless of the construct, it refers to studies devoted to the analysis of benefits, consequences, improvements, or future developments of online education, as well as student satisfaction with online education (SSOE) are enriching the literature.

The Covid 19 pandemics have important impact on the population around the world (Dementiev, 2021; Streimikiene, 2022). The pandemic context pushed education in directions nobody considered before. With or without proper internet connectivity, with or without tradition in organising and delivering online courses, with or without trained personnel for working in the online environment, in March 2020, hundreds of universities from approximately 75 countries around the world stopped face-to-face courses and suddenly switched to online teaching (Abbasi *et al.*, 2020; Chen *et al.*, 2020; Muthuprasad *et al.*, 2021). In this particular context, the interest in identifying student satisfaction with online education (SSOE) and its influencing factors increased among researchers (Hamdan *et al.*, 2021; ILO, 2020; Lincényi, Laczko, 2020; Ead *et al*., 2021; Cibák *et al*., 2021). It is not only about the importance of the moment itself (the "Great Pandemic", to make an association with "The Great Depression"), but mainly about identifying the influencing factors of SSOE, as the future in education is most certainly channelled towards the expansion of the online delivery, with or without the push caused by dire situations, such as COVID-19.

The extant literature displays many studies dedicated to online education during the COVID-19 pandemic (lockdown). Abbasi *et al.* (2020) investigated the perception of students about e-learning during the lockdown, discovering that almost two-thirds of the researched students had a negative perception about e-learning and most of them were in favour of face-to-face education. Adnan and Anwar (2020) pointed out that online learning could not produce the desired results in countries less endowed with internet connectivity (such as Pakistan) and that the Pakistani students missed face-to-face interaction with the instructors and the traditional classroom socialisation. On the same line, Kapasia *et al.* (2020), in a comparative study on 320 Pakistani and Brunei students, concluded about the importance of internet connectivity, accessibility and affordability during the lockdown. 50% of the investigated students from Brunei were satisfied with the use of online learning compared to 32.9% from Pakistani, as Brunei is better situated in terms of internet endowments. The study conducted by Baber (2020) looked at the determinants resulting in perceived student learning outcomes and the influence on student satisfaction during the pandemic, revealing similar results in terms of students missing interaction and developing specific worries because of isolation.

There is an increasing interest in studying SSOE in the context of the COVID-19 pandemic (Baber, 2020; Qazi *et al.,* 2020). The extant literature on online education constituents during the pandemic shows a number of perspectives that brought together can shed light on SSOE. Furthermore, expanding on Qazi *et al.*'s (2020) idea of using descriptive variables in explaining SSOE, a deeper understanding of the influencers of SSOE can be attained.

The present research started from the literature devoted to student satisfaction determinants and aimed to investigate the factors influencing business student satisfaction during the pandemic in Romania. The investigation was conducted in October 2020, after completing almost one semester in the online mode, covering online teaching, one online examination session, one online graduation session, one online resit session and two online

admission sessions at undergraduate and postgraduate levels. Romania is an interesting case, as it has very good internet connectivity, availability and affordability but lags behind in implementing online education (Edu *et al.*, 2021). Very few universities offered online courses before the pandemic or developed dedicated platforms for online learning (most of them being designed rather for delivering information online, not for online interaction with students). Moreover, almost none of the Romanian universities had a policy in training their staff for online teaching (in terms of specific course content or online delivery).

The study commences with the literature review, offering browsing through studies that investigated student satisfaction, mostly in the context of the pandemic. Research hypotheses are then built for the antecedents of SSOE and descriptive variables. The research methodology follows, presenting the questionnaire, sampling procedure, and the statistical techniques employed in the study. Data analysis and results are presented after the research methodology, being followed by discussion and testing of hypotheses, and conclusion and managerial implications. The paper ends with research limitations and future research directions.

1. Literature Review

Student satisfaction is a constant and a major interest issue among stakeholders involved in higher education and not only. Student satisfaction is comprehended as a resulting attitude of a learning experience appraisal when results surpass expectations (Elliot, Healy, 2001; Halaskova *et al*., 2021), in developing and implementing a market-oriented service strategy (Clemes *et al.*, 2008; Popescu, 2012). Despite this apparently simple definition, student satisfaction is a more complex issue (Elliot, Healy, 2001), referring to broader aspects of a student learning experience (Wiers-Jenssen *et al.*, 2002), that influence many managerial decisions at the university level and are of interest to society stakeholders. Student satisfaction is an indicator used in education quality monitoring (Razinkina *et al.*, 2018). Universities emphasise student satisfaction in their student recruitment and retaining endeavours (Elliot, Healy, 2001), or in their advertising campaigns of educational offers as this concept is deemed a significant prerequisite of referrals based on university resources and capabilities (Mavondo *et al.*, 2004). Business representatives also pay attention to student satisfaction, as satisfaction during university studies is considered an antecedent of the future performance as an employee and of employability (Abdullah *et al.*, 2014). Entrepreneurial studies also assess student satisfaction related to education, as entrepreneurial undertakings have a strong nurturing dimension, built and polished during undergraduate and postgraduate education (Abduh *et al.*, 2012). Therefore, the literature is abundant in perspectives looking at student satisfaction.

A particular body of literature concerning student satisfaction looks at online education. Online education has many connotations, being found in the literature under many instances, such as e-learning, online learning, virtual learning, distance learning, online collaborative learning, web-based learning or technology-mediated learning (Ali, Ahmad, 2011; Arkorful, Abaidoo, 2015). Arkorful and Abaidoo (2015) emphasise a series of benefits and downsides of online education. From the first category, the authors point out increased exposure for learners and tutors to educational and research resources, cost-effectiveness, self-pacing or flexibility, while from the second one less encounter with educational practices, poorer interactions with peers and faculty, less socialisation and teamwork.

As HE institutions pay close attention to the development of online education, SSOE benefits of similar consideration. SSOE should be analysed on an ongoing basis, as the online perspective is spreading out across universities and more and more HEs develop online programmes. According to Gallogly (2005) and Khiat (2013), understanding SSOE can enhance the ability of universities to make informed decisions about improving distance learning programmes. Understanding satisfaction is important as it provides a starting point in improving student learning. SSOE influences student retention (Cole *et al.*, 2014), with direct consequences on institutional revenues, and management plans to develop better practices in improving educational outcomes and e-learning performance (Raspopovic, Jankulovic, 2017).

SSOE gained a new perspective during the COVID-19 pandemic lockdown, as online education was not anymore an alternative, but the only possible educational option with approximately 75 countries communicating about closing the face-to-face schooling at all levels and switching to the online format through the use of online communication platforms (Chen *et al.*, 2020; Muthuprasad *et al.*, 2021). Moreover, according to Abbasi *et al.* (2020), when the pandemic started, online education was in the very early stages of implementation in many countries and neither students, professors, nor university managers were familiar with interaction platforms, online educational processes, or syllabus tailoring.

Additionally, the discrepancies in technology advancement between countries or within a specific country, assessed based on Internet infrastructure and population endowment with equipment to connect to the Internet had a significant impact on the degree of easiness for students, academic and non-academic staff to adapt to online education (Adnan, Anwar, 2020; Chen *et al.*, 2020; Dinh, Nguyen, 2020; Salto, 2020). Thus, technology is absolutely necessary to be considered when attempting to comprehend SSOE in the context of the COVID-19 pandemic.

Besides technological obstacles, deficiencies in faculty training for online teaching, lack of faculty support, untailored syllabus, difficulties in facilitating interactions between students and between staff and students, and even students' lack of interest or hesitation in exploring and engaging in the online educational environment, represented prerequisites for student dissatisfaction or anxiety related to the online mode (ILO, 2020; Khan, Abdullah, 2019). In the studies of Adnan and Anwar (2020), and Baber (2020) these aspects were explored as antecedents of learning outcomes and satisfaction. Hence, such factors can render a clear understanding of SSOE in the context of the COVID-19 pandemic.

The Romanian reality regarding SSOE is even more interesting and worthy to investigate. Romania has one of the fastest speeds of internet connection and one of the lowest costs of internet connectivity in Europe and not only (European Commission, 2020). Despite these endowments, online education is still in its infancy. In 2020, when the educational system was forced to switch to the online mode, a small number of Romanian universities had the technology and expertise to deliver online education, while the syllabus was not tailored for online teaching (Edelhauser, Lupu-Dima, 2020). Thus, the Romanian universities were forced to improvise swiftly.

Considering these realities, and developing on the recommendation of Pasion *et al.* (2020) to employ larger samples when attempting to comprehend educational perspectives during the COVID-19 pandemic, this research aims to investigate the antecedents of SSOE in the Romanian tertiary educational system during the COVID-19 pandemic by proposing and testing a model to assess their different weights in explaining SSOE. Additionally, this study gathers descriptive variables used in previous studies on education in the context of the COVID-19 pandemic (Abbasi *et al.*, 2020; Baber, 2020; Kapasia *et al.*, 2020; Qazi *et al.*,

2020) to use them as explaining variables of SSOE. All in all, this study will develop the literature from empirical and methodological perspectives.

2. Research Hypotheses

The online education literature prior to the COVID-19 pandemic displays an abundance of factors pertaining to process providers and receivers (Ali, Ahmad, 2011; Bolliger, Martindale, 2004; Cole *et al.*, 2014; Eom *et al.*, 2006; Kuo *et al.*, 2013; Mason, Weller, 2000), representing potential influencers of SSOE. These factors can be grouped into six categories (academic staff support, administrative staff support, syllabus structure, interactivity, student self-reliance and technology). Some of these factors were also used in studies performed during the COVID-19 pandemic focusing on e-learning student perceptions, learning effectiveness, outcomes or satisfaction, online education problems and solutions, transition to online education, or the impact of the pandemic on education (Abbasi *et al.*, 2020; Adnan, Anwar, 2020; Almusharraf, Khahro, 2020; Baber, 2020; Edu *et al.*, 2021; ILO, 2020; Pasion *et al.*, 2020).

The first two groups of factors considered by this study are *academic staff support and administrative staff support.* Online education embeds various skills, from pedagogical ones to online design and technological skills, specific to the online mode communication abilities. Therefore, factors such as academic staff support and administrative staff support are mentioned in many studies. In their study conducted on 245 students on key factors for determining SSOE, Ali and Ahmad (2011) underlined the importance of instructors' performance for increasing students' satisfaction. In studies performed during the COVID-19 pandemic (ILO, 2020; Kuo *et al.*, 2013) skills of academics and technical assistance provided during online classes had a direct impact on SSOE. In a survey on 283 students in Saudi Arabia, academic and administrative staff support were positively correlated with a high level of student satisfaction (Almusharraf, Khahro, 2020). Therefore, this study assumes that support received from academic and administrative staff is of high importance in building SSOE. As Romanian universities do not have a tradition in delivering online courses and Romanian students were not familiar with online education before the pandemic, the first two hypotheses for this research are:

H1. The academic staff support has a direct relationship with SSOE
H2. The administrative staff support has a direct relationship with SSOE

The third group of SSOE influencers gathered from the literature is represented by *syllabus structure.* Deciding what content to deliver for online education is extremely important. Syllabus structure includes course objectives (specified in the course syllabus, and referring mostly to topics to be learned, the workload in completing assignments, class participation expectations specific to online education) and course infrastructures, such as a website or course delivery system (Freeze *et al.*, 2010). Improper syllabus structure, lack of customisation and poor adaptation of course content specific to the new mode of teaching negatively influenced SSOE, as many studies demonstrated (Abbasi *et al.*, 2020; Adnan, Anwar, 2020; Almusharraf, Khahro, 2020; Baber, 2020; ILO, 2020). Developing on the extant literature, the present study presumes that syllabus structure can influence SSOE, hence, the third hypothesis is:

H3. The syllabus structure has a direct relationship with SSOE

Interactivity arose as a major concern when discussing online education. *Interactivity* comprises a broad group of factors, including interaction and engagement (Abbasi *et al.*, 2020; Pasion *et al.*, 2020). Swan (2001) points out that interaction is a crucial factor, analysed by almost all studies concentrated on SSOE. According to Anderson (2003), high levels of interactivity lead to a more satisfying educational experience. A number of studies discussed the importance of interactivity during the pandemic lockdown, not only in determining SSOE, but also in assessing the perception of e-learning, quality of learning, student mental health status, or measuring the impact of the pandemic (Abbasi *et al.*, 2020; Baber, 2020; Elmer *et al.*, 2020; Hamdan *et al.*, 2021; Pasion *et al.*, 2020). Hamdan *et al.* (2021), in a study conducted on 702 undergraduate students from Jordanian universities, identified that among the most significant predictors for student satisfaction were interaction (with peers and staff) and self-internet efficacy. Abbasi *et al.* (2020) determined that more than 80% of the surveyed students perceived student-faculty interaction as being limited. Baber (2020) uncovered that interaction had a direct positive influence on learning outcomes which had a further direct positive influence on satisfaction. Elmer *et al.* (2020) demonstrated that lack of interaction was one of the reasons for the depreciation of students' mental health. Pasion *et al.* (2020) revealed that students that were forced to switch to online education maintained their attention and perseverance in handling their tasks but they did not maintain their involvement (engagement) at the same level. Considering this variety of perspectives, this research considers interactivity to be a potential key influencer of SSOE, therefore, the fourth hypothesis for this study is:

H4. Lack of interactivity with other students and academics has an inverse relationship with SSOE

The extant literature also mentions *technology* as another important factor influencing SSOE. Technology is essential in online education and a sine qua non-condition for universities to deliver the educational services online, and the means necessary for learners to receive the services. Studies like those of Bolliger and Martindale (2004) and Eom *et al.* (2006) pointed out technology amongst the factors affecting student satisfaction. Mostly, during the lockdown period in 2020, the access to technology (in terms of connectivity, devices and affordability) determined to a great extension the satisfaction perceived by students (Chen *et al.*, 2020; Dinh, Nguyen, 2020). Adnan and Anwar (2020), in a study conducted on 126 students from Pakistan, discovered that 51.6% of the investigated students considered that internet coverage availability and reception constituted the major problem behind the limited internet access, and 11.1% considered internet services being very expensive for regular online connectivity. Therefore, the next hypothesis for this research is:

H5. Technological factors (internet connectivity and availability) have a direct relationship with SSOE

Student self-reliance is the sixth category of influencers delineated from the literature. This category refers to those factors related to the student's capacity of being accustomed to online education, or to *internet self-efficacy* (Kuo *et al.*, 2013), as satisfaction is higher for students used with online education than for students less accustomed to online education (Qazi *et al.*, 2020). Lack of self-reliance in using technology may decrease SSOE and lower students' performance (Kuo *et al.*, 2013). Students, although they are technologically savvy when it comes to social media, still lack skills in using technology for educational endeavours and in managing time in the online mode (Blanco *et al.*, 2020; Müller *et al.*, 2021). This

research assumes that student self-reliance has an important influence on SSOE. Hence, the next hypothesis of this research is:

H6. Lack of self-reliance displayed by students has an inverse relationship with SSOE

Research hypotheses on descriptive variables

Together with the aim to identify factors influencing SSOE during the COVID-19 pandemic, this research proposes to expand the literature on this topic by employing descriptive variables in the explanatory model and, thus, delivering additional empirical evidence for a better understanding of this concept. Building on previous works (Abbasi *et al.*, 2020; Baber, 2020; Kapasia *et al.*, 2020; Qazi *et al.*, 2020), 5 descriptive variables were selected to be included and tested.

Online platform used by the university

In the context of the COVID-19 pandemic, upon the transition to online education, IT platforms became the classrooms, actually the only possible means to provide educational services. Abbasi *et al.* (2020) recommended that in the COVID-19-context, universities should focus on the administrative part in order to provide adequate educational services. Qazi *et al.* (2020) attempted to explain satisfaction based on a model including examples of online platforms. Therefore, the present research assumes that online platform is the focal point in online learning and proposes the following hypothesis to be tested:

H7. University online platform functionality directly influences SSOE

Online class attendance

The online education literature in general, and that on the impact of COVID-19 on education in particular, prompts demographic and behavioural variables, but in almost all situations such variables are used to describe the surveyed sample.

In the pandemic, the interaction between instructors and students being almost exclusively online in many universities around the world rendered class attendance an essential source of information, communication and feedback. If before the pandemic, time spent online and class attendance were investigated separately, with research showing no correlation between satisfaction and attendance (Moore, Quintanilla, 2013), during COVID-19, studies started to combine these factors and analyse them together (Kapasia *et al.*, 2020). Divergent results are displayed in the literature. The study of Basuony *et al.* (2021), conducted on 280 undergraduate students in business schools in Cairo, Egypt, rejected the hypothesis of a significant positive relationship between class participation and student satisfaction with online learning during the pandemic. On the opposite side, the study conducted by Rakhmanov and Ulasbekov (2021) concluded that online lecture attendance was among the effective factors influencing personal development and student satisfaction. This research presumes that online class attendance positively impacts student satisfaction, thus, the following hypothesis is presumed:

H8. Students attending more classes are more inclined to be satisfied with online education (SSOE)

Gender

Gender is one demographic variable employed in online education studies (Ali, Ahmad, 2011; Bolliger, Martindale, 2004; Eom *et al.*, 2006). When used as an explanatory variable, Kuo *et al.* (2013) uncovered that women students were more interactive than men in a learner-learner perspective. Gender was also used in studies centred on the impact of

COVID-19 on education but, especially, to describe the sample (Abbasi *et al.*, 2020; Baber, 2020; Kapasia *et al.*, 2020). However, analysing the influence of gender, Qazi *et al.* (2020) did not find any differences between men and women on online education satisfaction. Considering these perspectives, the present research aims to test whether gender has an impact on student satisfaction. Therefore, the next hypothesis is presented:

H9. Women are more likely to be satisfied with online education (SSOE) than men

Enrolment level

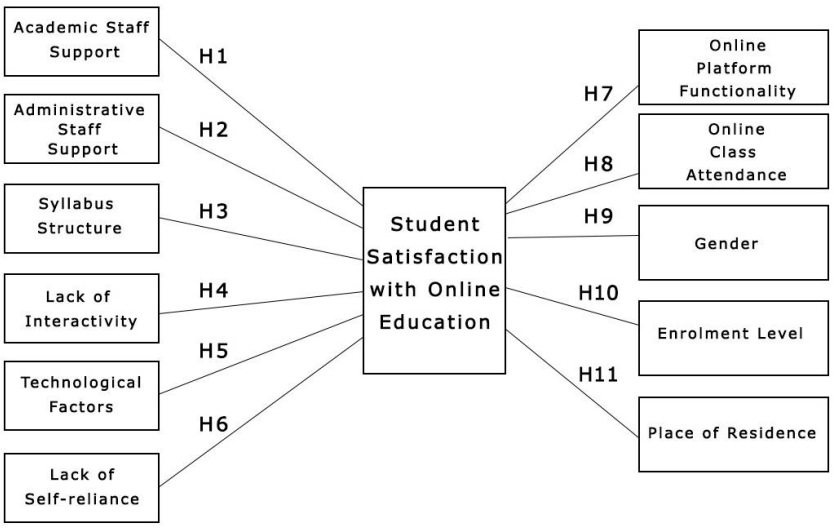
Student academic enrolment level was adopted in previous studies on online education, especially related to the sample structure (Ali, Ahmad, 2011; Eom *et al.*, 2006). However, when integrated as an independent variable, Kuo *et al.* (2013) uncovered that graduate students were more interactive with their peers compared to the undergraduates. In the COVID-19-context education, Kapasia *et al.* (2020) employed academic level to describe the sample size, while Qazi *et al.* (2020) as an independent factor, uncovering no significant differences between undergraduate and postgraduate students on online education satisfaction. Thus, this study assumes that there are differences between undergraduate and postgraduate students when it comes to online education satisfaction, and, hence, proposes to test the following hypothesis:

H10. Postgraduate students are more likely to be satisfied with online education (SSOE) than undergraduates

Place of residence

Place of residence was used in previous studies on education in the context of COVID-19 to describe the sample, Kapasia *et al.* (2020), analysed both residential area and residence during the lockdown, or to explain satisfaction, Qazi *et al.* (2020) established that urban residents were more satisfied than rural residents in the case of two countries. This paper presumes that place of residence in the context of online education impacts student satisfaction, and, thus, the following hypothesis is extended:

H11. Students living in urban areas during online classes are more inclined to be satisfied with online education (SSOE) than those living in rural areas



Source: authors' own compilation from the literature.

Figure 1. **Research Model of Student Satisfaction with Online Education (SSOE)**

Summing up, this study considers online education constructs in higher education in the context of the COVID-19 pandemic, with an impact on SSOE. The functionality of the online platform/s used by the university as well as online class attendance was considered to be insightful in understanding SSOE. Additionally, gender, enrolment level, and place of residence were selected to build and test a comprehensive model (*Figure 1*).

3. Research Methodology

This study entailed using an online questionnaire, and convenience sampling (Baber, 2020; Basuony *et al.*, 2021). Business students registered at undergraduate and postgraduate programmes offered by Romanian universities were encouraged to complete the questionnaire between October 1st and 31st, the respective month being the first one of the academic year 2020–2021, at the time students have already had an experience with online education from the previous academic year, covering almost one semester of online teaching, one examination session, one graduation session, one resit session and two admission sessions at undergraduate and postgraduate levels. By questioning students about their satisfaction with online education after one semester of experience in the online mode, the study wanted to eliminate, as much as possible, the shocks provoked by the sudden transition to online education and to retain the most persistent influencing factors that remained after this experience. A hierarchy of the influencing factors of SSOE can be more reliable for decision-making and further analyses.

23 (5-level) Likert scales were used to gather data (extending from very good/highly confident to very bad/highly unsure), the items being drawn or derived from the literature (Almusharraf, Khahro, 2020; Basuony *et al.*, 2020; Edu *et al.*, 2021; Kuo *et al.*, 2013). Moreover, categorical scales were employed to assess online platform functionality (inadequately/adequately most of the time/exceptionally well) and online class attendance (25% or less/50% or more/100%), drawing from the research of Baber (2020), and Qazi *et al.* (2020), and demographics ((gender (man/woman), enrolment level (undergraduate/postgraduate) and place of residence (urban/rural)), developing on Qazi *et al.*'s work (2020). SSOE was evaluated based on a categorical scale (satisfied versus dissatisfied).

The questionnaire was tested prior to being uploaded online on a sample of 10 students (Parahoo *et al.*, 2016), enrolled in undergraduate (5 students) and postgraduate (5 students) programmes. Based on the feedback, 5 Likert scales were amended.

Exploratory Factor Analysis was used to group into factors the items pertaining to the educational process identified in the literature, and, logistic regression to assess the impact of the identified factors, together with online platform functionality, online class attendance, and gender, enrolment level and place of residence on SSOE.

4. Data Analysis and Results

492 students registered in undergraduate and postgraduate business programmes completed the questionnaire. Once the screening process was finalised, 446 valid questionnaires were retained for analysis. The sample size exceeds the sample sizes used in similar studies (Almusharraf, Khahro, 2020; Baber, 2020; Basuony *et al.*, 2021; Qazi *et al.*, 2020).

The descriptive statistics are displayed in *Table 1*.

Table 1. Descriptive statistics

Variable	Value	Percent
Gender		
Men	108	24.22
Women	338	75.78
Enrolment level		
Undergraduate	343	76.91
Postgraduate	103	23.09
Place of residence		
Urban	350	78.48
Rural	96	21.52
Online class attendance		
25% or less	15	3.36
50% or more	152	34.08
100%	279	62.56
Online platform functionality		
Inadequately	27	6.05
Adequately most of the time	232	52.02
Exceptionally well	187	41.93

Source: own calculations.

Table 2. Exploratory Factor Analysis of educational process items

Rotated Factor Matrix[a]				
	Factor			
	F1	F2	F3	F4
Population endowment with communication devices				
Internet connectivity problems during online classes				
Online interactivity between students			.650	
Online interactivity of students with subjects/topics			.645	
Student self-reliance in familiarising with online classes				.742
Student self-reliance in using online education applications (apps)				.753
Missing interactivity with peers			.616	
Missing interactivity with academics/faculty			.758	
Online education support received from the university's non-academic staff	.627			
Academic staff- online education conduct/work	.794			
Academic staff- compassion/tolerance during online teaching	.775			
Academic staff- performance during evaluations	.719			
Academic staff- digital proficiency	.708			
Academic staff- proficiency to adapt the syllabus to online teaching	.639			
Academic staff- readiness to reply to student questions	.718			
Online class attendance by students with video and audio devices				
Online teamwork for tasks				
Online teaching material made available		.552		
Student self- reliance regarding online evaluations				.473
Online syllabus accuracy and suitability		.800		
Online syllabus adequacy		.783		
Online syllabus organisation		.707		
Availability and provision of good quality Internet services for online education			.451	

Notes: Extraction Method: Principal Axis Factoring; Rotation Method: Varimax with Kaiser Normalization; [a]Rotation converged in 7 iterations. Note B: Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.887; Bartlett's Test of Sphericity- Sig.: 0.00. Cronbach Alpha: >0.70 for all factors and between factors.

Source: own calculations.

The topics uncovered in the literature were expressed through 23 items and analysed by using Exploratory Factor Analysis (EFA) based on Principal Axis Factoring extraction,

and Varimax rotation. In the EFA, factor loadings of minimum 0.40, Eigenvalues above 1 and a Scree plot (Field, 2009) were employed, while for scale reliability a Cronbach Alpha value higher than 0.7 (Nunnally, 1978) was used. Thus, 4 items were discarded as they did not build into a factor, while the remaining 19 were built into 4 factors comprising at least three items per each (Henson, Roberts, 2006) (*Table 2*). The factors were named: F1 (Assistance from academic and non-academic staff), F2 (Syllabus structure), F3 (Lack of intercommunication), and F4 (Lack of student self-reliance). As it can be observed, the items for academic staff support and administrative staff support combined into one factor, F1, while one item measuring technology was attached to the items measuring interactivity, rendering one factor, F3.

The factors are displayed in *Table 2*.

Table 3. Logistic regression- student satisfaction with online education (SSOE) as dependent variable

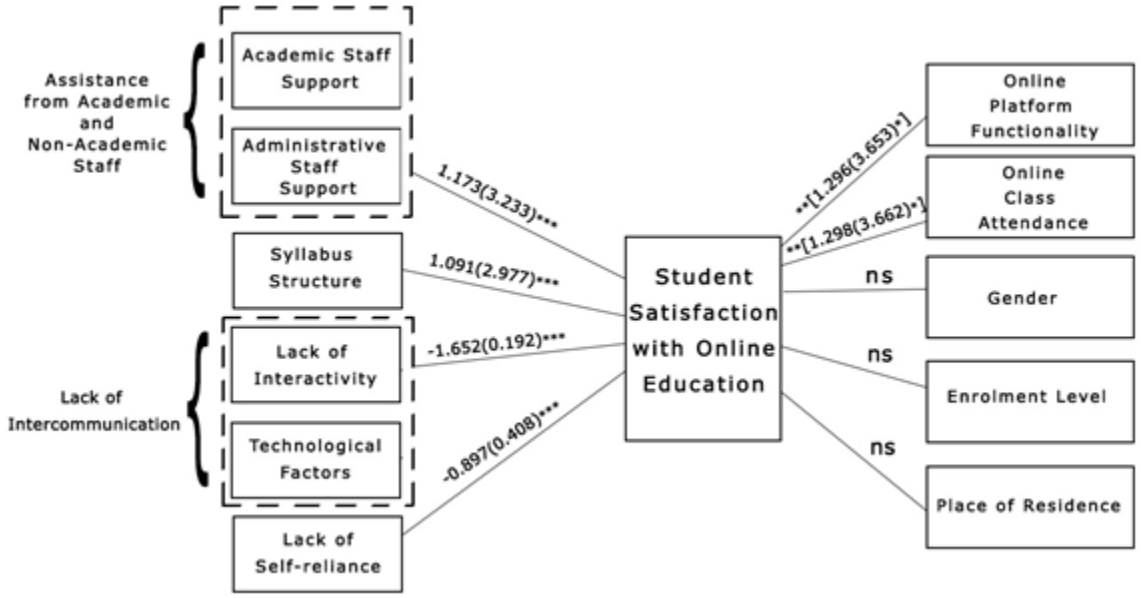
Variables in the Equation								
	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
F1 (Assistance from academic and non-academic staff)	1.173	.193	36.855	1	.000	3.233	2.213	4.722
F2 (Syllabus structure)	1.091	.170	40.987	1	.000	2.977	2.132	4.158
F3 (Lack of intercommunication)	-1.652	.237	48.488	1	.000	.192	.120	.305
F4 (Lack of student self-reliance)	-.897	.179	25.024	1	.000	.408	.287	.579
Online platform functionality (*Inadequately*)			11.487	2	.003			
Adequately most of the time	.167	.506	.109	1	.742	1.182	.438	3.188
Exceptionally well	1.296	.573	5.109	1	.024	3.653	1.188	11.234
Online class attendance (*25% or less*)			9.541	2	.008			
50% or more	.440	.531	.686	1	.408	1.552	.548	4.396
100%	1.298	.553	5.503	1	.019	3.662	1.238	10.831

Notes: Hosmer and Lemeshow Test- non-significant value ($p>0.05$)-adequate level of data fitting; Chi-square = 300.167 ($p<0.001$); Nagelkerke R Square = 0.653; correctly classifying 83.9% of the cases; Logistic regression assumptions met (according to Haydam *et al*., 2017).

Source: own calculations.

The four factors delineated in the EFA, together with online platform functionality, online class attendance, gender, enrolment level and place of residence, were regressed against SSOE by employing logistic regression.

The most comprehensive model includes six significant variables (Wald tests, $p<0.001$ for the first four variables, $p<0.01$ for the fifth and sixth variables) (*Table 3* and *Figure 2*), the impact of each variable on satisfaction with online education (SSOE) being explained based on the odds ratio.



Notes: *p<0.05; **p<0.01; ***p<0.001; ns- not significant.

Source: own research.

Figure 2. **Research Findings**

F1 (Assistance from academic and non-academic staff), with an odds ratio of 3.233, displays that an increase of one unit on the measurement scale of the predictor increases the odds of being satisfied with online education by a multiplicative factor of 3.233. F2 (Syllabus structure), with an odds ratio of 2.977, displays that an increase of one unit on the measurement scale of the predictor increases the odds of being satisfied with online education by a multiplicative factor of 2.977. F3 (Lack of intercommunication), with an odds ratio of 0.120, displays that a decrease of one unit on the measurement scale of the predictor increases the odds of being satisfied with online education by a multiplicative factor of 8.333. F4 (Lack of student self-reliance), with an odds ratio of 0.287, displays that a decrease of one unit on the measurement scale of the predictor increases the odds of being satisfied with online courses by a multiplicative factor of 3.484.

The variable *online platform functionality* (significant overall at p<0.01), with an odds ratio of 3.653 (p<0.05), displays that students considering that the platform worked exceptionally well were 3.653 times more inclined to be satisfied with online education than those considering that the platform worked inadequately.

The variable *online class attendance* (significant overall at p<0.01), with an odds ratio of 3.662 (p<0.05), shows that students who attended all online classes were 3.662 times more inclined to be satisfied with online education than those who attended 25% or less of the online classes.

5. Discussion and Testing of Hypotheses

The EFA grouped the educational process items assessed in this study in four factors, two pertaining to school and two to students, the two factors focusing on students having a higher impact on SSOE. Hence, F3 (Lack of intercommunication) had the most significant

impact on SSOE, followed by F4 (Lack of self-reliance), F1 (Assistance from academic and non-academic staff) and F2 (Syllabus structure).

The findings are discussed following the order of the research hypotheses.

F1 (Assistance from academic and non-academic staff) had a statistically significant direct impact on SSOE, hence, hypotheses H1 and H2 are supported. This study provides a different perspective through the merging of the academic and non-academic support types rendered by the factor reduction methodology. This view is more thorough and, probably, more adequate for online education as in many situations in which students seek support, the solutions and/or answers come from both faculty and administrative staff. The results are in sync with conclusions on the impact of academic and non-academic support on satisfaction prompted by studies performed prior to the COVID-19 pandemic (Ali, Ahmad, 2011; Bolliger, Martindale, 2004; Eom *et al.*, 2006) and during it (Almusharraf, Khahro, 2020; Baber, 2020; ILO, 2020). A possible explanation for the significant impact of this factor on SSOE could come from possible trade-offs made by students with other factors. For example, if the content of the syllabus is not clear enough, one student may still feel satisfied with online education if proper support is provided by faculty and administrative staff. Moreover, in the Romanian context, with exclusive online courses before the pandemic being almost inexistent, and students not being familiar with online teaching, the support offered by both academic and non-academic staff most certainly compensated for a lack of or poorly implemented elements specific to online education (such as online course dedicated platform, or specific content for online courses). Also, in the context of limited human interactivity, the assistance provided by instructors and administrative staff on different aspects, compensates, in part, for this lack of interactivity.

F2 (Syllabus structure) had a statistically significant direct impact on SSOE, thus, hypothesis H3 is supported. This finding is on the same length as the results recorded in studies completed before the pandemic (Cole *et al.*, 2014) and during the pandemic (Abbasi *et al.*, 2020; Adnan, Anwar, 2020; Baber, 2020; Basuony *et al.*, 2021; ILO, 2020). The syllabus is important and must be adapted to the specific context of education delivery. In the Romanian situation, syllabus content, course structure, teaching materials and the items grouped under this factor (see *Table 2*) were not specially designed for online delivery (Maier *et al.*, 2020), but 'ad hoc' adapted, by each academic, without organisational coordination. Some of the courses were easily transformed or adapted for the online mode, as their instructors were better skilled to change the syllabus and course content for online delivery. Other courses and teaching materials were kept unchanged to a significant extent, being merely conveyed online instead of face to face. It is, therefore, not surprising that this factor is the least important one in influencing SSOE and it can be assumed that a part of the dissatisfaction perceived because of the lack of adequacy of the online syllabus was compensated by the personal involvement of the academic staff, who struggled to provide additional support for students. The results prompt the necessity for an institution to adapt the syllabus to online education in order to deliver an effective educational process, to offer coordination and training for online course content creation and delivery and, as some studies suggest, with new instructional strategies in implementing online teaching in higher education (Mahmood, 2021) and reform of information-based education (Chen *et al.*, 2020).

F3 (Lack of intercommunication) had a statistically significant inverse impact on SSOE. The EFA coupled the items specific to the lack of interactivity and technology in one factor. Therefore, hypothesis H4 was supported, while hypothesis H5 was not supported. However, the results should be treated with caution as in the pandemic context, interactivity

was possible only through technology and therefore, technology is an inherent, sine qua non element of interaction. The findings are on the same length as those of Elmer *et al.*'s (2020), as these authors believe that the pandemic lead to heightened stress and anxiety, and loneliness. Student life means social interactions (McInnis 2004), too, which cannot be reduced just to online interaction. The outcomes of this study are obvious and in line with findings of other studies that demonstrated that technology was rather a hindrance in online education (Adnan, Anwar, 2020; Dinh, Nguyen, 2020). Despite the very good internet coverage and speed in Romania (Statista, 2020; European Commission, 2020), these technological endowments did not compensate for the sense of loneliness, anxiety, or frustration of being deprived of social networking, or boredom (Maqableh, Alia, 2021). F3 (Lack of intercommunication) is by far the most important factor influencing SSOE (almost 2.5 times stronger than the influence of F4 (Lack of student self-reliance). This strong influence can be explained, again, by the lack of tradition in online education in Romania (students being prepared, mentally and through training, for face-to-face interaction and not for online interaction), insufficient specific and specialised support for online education (most of the universities used free online platforms, like Zoom, Google meet or Teams, and those who had their own online platforms had significant difficulties in providing video and audio interaction) and by the low proportion of instructed personnel, capable to develop specific online activities to compensate for the lack of physical intercommunication.

F4 (Lack of self-reliance) had a statistically significant inverse impact on SSOE, hence hypothesis H6 is supported. This finding is in sync with conclusions of studies conducted before the pandemic (Kuo *et al.*, 2013), and those completed during the COVID-19 pandemic (Qazi *et al.*, 2020), as they emphasised that a lack of assurance related to technical skills might have a negative impact on SSOE. This factor is the second most important influencer of SSOE and this hierarchy is, in a way, a concerning result, although it is in line with the findings of other studies. The students participating in this study are digital natives (Kirschner, De Bruyckere, 2017) However, a study performed in 2020 in Romania (Maier *et al.*, 2020) on 206 university students revealed that approximately 70% of those questioned did not have any prior extensive experience in web-based learning, thus, pointing out a disturbing aspect. Schools, in general, and universities, in particular, should pay more attention to building true digital skills for students pertaining to information, communication, or problem-solving skills, as technology develops very rapidly and the labour market is requesting more and more personnel with digital skills. Digital literacy is a problem in Romania, being in dissonance with its very good position in internet connectivity and speed. According to Eurostat data (2021), in 2019 only 22% of the Romanian young people (ages 16 to 24) were endowed with above basic overall digital skills, representing the lowest score in the EU.

Online platform functionality had a statistically significant direct impact on SSOE, hence, hypothesis H7 is supported. When the platform worked exceptionally well, students were satisfied with the online educational process. This result is an expected one and is in line with the findings of Abbasi *et al.* (2020), Baber (2020) and Qazi *et al.* (2020).

Online class attendance had a statistically significant direct impact on SSOE, thus, hypothesis H8 is supported. This study is one of the few conducted during the COVID-19 pandemic in which attendance was used as an explanatory variable. This variable was used, for example, by Baber (2020) and Kapasia *et al.* (2020) in the form of the online learning experience as a descriptive variable for the employed sample, and by Rakhmanov and Ulasbekov (2021) to relate attendance to personal development and satisfaction. Students who attended all classes were more satisfied with online education than the rest. This perspective is

understandable considering that these students had more time to adapt to the peculiarities of the online education environment. This finding is in sync with Kuo *et al.*'s (2020) conclusions, as they uncovered a direct relationship between time spent online and accommodation with tasks and assessments. This result is congruent with the rest of the factors that influenced SSOE. Students that attended online courses overcame doubts related to the unknown mode of education, benefited from the direct support of the instructors, increased their self-confidence and became more familiarised with online education.

Gender did not statistically significantly influence SSOE, hence hypothesis H9 is not supported. This result expands on Qazi *et al.*'s conclusion (2020) of no difference between men and women when it comes to online education satisfaction. This outcome could be explained by presuming that all students, regardless of gender, were affected by the online education environment to the same extent

Enrolment level did not statistically significantly influence SSOE, thus hypothesis H10 is not supported. This finding confirms the result of Qazi *et al.* (2020), as they delineated no significant difference between undergraduate and postgraduate students regarding online education satisfaction. Probably, both groups of students similarly perceived the online education process. Although one could expect that postgraduate students would be more familiar with online tools for practical reasons due to being older and, presumably, being endowed with more work experience.

Place of residence did not statistically significantly influence SSOE, therefore hypothesis H11 is not supported. The result contradicts the conclusions of Qazi *et al.* (2020), as they uncovered that people residing in urban areas were more satisfied with online education than the ones living in rural areas. The results may be surprising, as urban areas are more developed than rural ones when it comes to Internet infrastructure (Statista, 2020). However, as the online mode for education in Romania did not require specific conditions regarding connectivity, the internet coverage in Romania being beyond acceptable even in rural areas, while, traditionally, students reside mostly in areas with good connectivity (including rural areas), the result is not so surprising.

Conclusions, Theoretical Significance and Managerial Implications

As there were very few studies conducted in Romania on business students regarding their satisfaction with online education (SSOE) after a full semester in the online mode, including tuition, examination and admission experiences, this research aimed to identify factors that affected SSOE and to measure the strength of these factors on SSOE.

Expanding the exploration of student satisfaction is a worthwhile scientific and practical venture considering the extant rich literature on this topic which covers from theoretical perspectives to managerial implications for the purpose of designing and delivering proper education which will benefit the students and society through stimulating their personal development and easing their employability. In this particular case of pandemic times, for a country like Romania, without tradition in online education but with very good internet connectivity, availability and affordability, investigating factors that determine student satisfaction is of crucial importance, especially for managerial reasons. Identifying factors that influence SSOE and measuring the strength of this influence can improve the decisions universities will make for the future of online education, in both the course of action and its content. It is obvious that the return from the current pandemic will be to a different reality to the one before the COVID-19 pandemic and the demand for online education will

grow. Therefore, it is important to strengthen those factors that lead to student satisfaction and to correct and improve the sources of dissatisfaction. This research, conducted among 446 business students, despite the fact that it did not employ a representative sample of students for Romania, displays results obtained after a complete online learning experience, including lectures, seminars, and evaluations. Therefore, students were able to express well-founded opinions, rendering more reliable findings for decision-making and further investigations.

Theoretical Significance

Based on the literature, six categories of factors influencing SSOE were considered for this investigation: academic staff support, administrative staff support, syllabus structure, interactivity, student self-reliance and technology. The factors were expressed through 23 items (5-level Likert scales), data was collected through a questionnaire and analysed by using Exploratory Factor Analysis (EFA) based on Principal Axis Factoring extraction, and a Varimax rotation. The results rendered four factors: F1 (Assistance from academic and non-academic staff), F2 (Syllabus structure), F3 (Lack of intercommunication), and F4 (Lack of student self-reliance). The items for academic staff support and administrative staff support combined into one factor, F1, while one item measuring technology was attached to the items measuring interactivity, rendering one factor, F3. The four factors delineated in the EFA, together with online platform functionality, online class attendance, gender, enrolment level and place of residence, were regressed against SSOE by employing logistic regression. Hence, the present study expands the satisfaction theory in education through the proposed and tested methodology that can be applied not limited to higher education.

The findings show that the most important factor in determining SSOE was F3, Lack of intercommunication. F4 (Lack of student self-reliance) and F1 (Assistance from academic and non-academic staff) displayed the second and third strengths on SSOE. The least important effect on SSOE was displayed by F2 (Syllabus structure). It can be concluded that the two factors focusing on students had a higher impact on SSOE, compared to those two factors pertaining to universities. Thus, the present study expands the literature through the provision of a structured and comprehensive mix of online education prerequisites, grouped in two categories, one pertaining to students and the other one to institutions.

Online platform functionality, online class attendance, gender, enrolment level and place of residence, were regressed against SSOE by employing logistic regression. This study is one of the few conducted during the COVID-19 pandemic in which attendance was used as an explanatory variable. The results display that online platform functionality and online attendance have a positive impact on SSOE, hence, expanding the literature on the importance of descriptive variables in explaining student satisfaction.

Managerial Implications

The lack of tradition and experience in online education of the Romanian universities multiplied students' disorientation caused by the sudden immersion in the online mode, their emotional problems, or their frustration about the loss of student life experiences. Factor F3 (Lack of intercommunication) detached itself in importance more than 2.5 times compared to the factor placed in the second position. This result also has a complex implication on the rest of the factors. It is a fact that during online classes, physical interaction is missing, creating a sort of loneliness, emotional distress and time management issues (Elmer *et al.*, 2020).

However, a comprehensive staff (academic and non-academic) training for online education, a tailored curriculum for online courses, an adapted delivery of the course content, or specifically designed projects for different subjects to engage students in online teamwork may diminish all these negative consequences created by the absence of physical interaction. These courses of action can favourably impact the online educational process not only during these dire pandemic times but also upon returning to normality, as online education has significant benefits for both students and universities.

The second most important influencer of SSOE, F4 (Lack of student self-reliance), draws attention to what the purpose of the educational system, in general, and that of universities, in particular, should be regarding the consolidation of students' digital skills, the focus not being limited to improving their performance and confidence but extended to enhancing their employability and preparedness for the future economy, which will be more and more digitalised.

The close-recorded influences on SSOE of F1 (Assistance from academic and non-academic staff), F2 (Syllabus structure), and F4 (Lack of student self-reliance) should be interpreted based on an existing mutually influential relationship. Concretely, in online education, students need an adapted curriculum that is delivered in a proper mode, coupled with specific support offered by academic and non-academic staff and ongoing training in using specific platforms. If these learning prerequisites are well planned, clearly explained and properly implemented, they most certainly can have a significantly positive influence on student satisfaction.

The findings display that online platform functionality and online attendance have a positive impact on SSOE. This is an expected and common-sense conclusion: if the platform does not work, courses are not delivered. The positive influence of attendance on SSOE is also an expected result, even if it is in opposition to findings of studies like Basuony *et al.* (2021). It relates to the lack of tradition and usage of the online educational environment. Students can understand better when they attend online classes, they can be better assisted by staff, and, thus, diminish their anxiety. Gender, enrolment level, and the place of the residence resulted in not being significant in influencing SSOE. Both female and male students pursuing either undergraduate and postgraduate programmes seemed to be equally affected by the online mode, without a specific influence of gender and enrolment level on SSOE. Differences in internet connectivity, accessibility and affordability between rural and urban areas in Romania are not that large as to determine major dysfunctionalities in participating online in courses and other educational processes.

Research Limitations and Future Research Directions

This study is not without limitations. The first limitation is connected to the sampling procedure. The findings cannot be generalised to the entire student population in Romania. However, the results shed light on a topic of significant importance to stakeholders involved in higher education, that of student satisfaction with online education in the COVID-19 pandemic context, based on a model including online education prerequisites and descriptive explaining variables. Future studies should test the proposed research model by using samples configured based on probabilistic sampling procedures. The second limitation looms in the context of the students' field of study. This research focuses only on students enrolled in undergraduate and postgraduate business programmes. Hence, the findings cannot be extended to all Romanian higher education students. Nevertheless, the tested model and

results of this study can be used as a starting point in future studies covering students registered in other fields of study.

Future studies could also focus on expanding the model by exploring whether there are differences between public and private universities, or how the online evaluation influenced student satisfaction.

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STUDENTŲ PASITENKINIMO ELEKTRONINIU ŠVIETIMU COVID-19 PANDEMIJOS METU RUMUNIJOJE TYRIMAS: LOGISTINĖS REGRESIJOS METODAS

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SANTRAUKA

Studentų pasitenkinimas – vienas svarbiausių aukštojo mokslo (AM) kokybės rodiklių – dėl staigaus perėjimo prie elektroninio švietimo COVID-19 pandemijos metu įgijo skirtingą reikšmę. Dėl šios priežasties atsirado naujų mokslinių tyrimų spragų. Šiame tyrime nagrinėjami veiksniai, turintys įtakos studentų pasitenkinimui elektroniniu švietimu (SPEŠ) Rumunijos aukštosiose mokyklose COVID-19 pandemijos metu. Remiantis esama literatūra apie SPEŠ, šiame tyrime buvo apklausti 446 verslo studijų studentai ir atlikta faktorinė analizė. Išanalizavus gautą informaciją buvo suformuotos keturios veiksnių grupės ir toliau suskirstytos kartu su aprašomaisiais kintamaisiais siekiant įvertinti jų poveikį SPEŠ. Tyrimas atskleidė stipriausius veiksnius – tarpusavio bendravimo trūkumą ir nepasitikėjimą savimi; taip pat galima paminėti pagalbą iš mokslo ir ne mokslo darbuotojų bei internetinę mokymo programą. Internetinės platformos funkcionalumas ir virtualių pamokų lankomumas turėjo didelės įtakos SPEŠ. Tyrimas praplečia literatūros šaltinių spektrą pasitelkus išbandytus modelius, įtraukiant švietimo konstruktus ir aprašomuosius kintamuosius kaip aiškinamuosius veiksnius. Siekiant pagerinti studentų skaitmeninius įgūdžius ir parengti juos ateities ekonomikai, pateikiamos vadybinės rekomendacijos dėl darbuotojų mokymo ir mokymo programos keitimo. Modelį galima išplėsti ištyrus studentų elektroniniame švietime naudojamos įrangos amžių ir tipą, išskiriant valstybines ir privačias aukštojo mokslo institucijas.

REIKŠMINIAI ŽODŽIAI: studentų pasitenkinimas; elektroninis švietimas; COVID-19 pandemija; verslo studijų studentai; Rumunija; pagrindinių komponenčių analizė (PKA); logistinė regresija.