

## FROM CRISIS MODE TO CHOICE: FACTORS INFLUENCING STUDENT SATISFACTION WITH ONLINE EDUCATION

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**Annotation.** This study examines undergraduate students' satisfaction with online learning compared to traditional teaching at a Romanian economic university. Using survey data from 313 students collected between April 2022 and March 2023, the research analyzes satisfaction levels, perceived challenges, and key predictors influencing the online learning experience. Results indicate generally high satisfaction, frequent use of audio-video platforms, and strong recognition of cost savings, although some students reported technological barriers, workload pressure, and emotional difficulties. Regression analyses reveal a bidirectional relationship between satisfaction and preference for online learning, and underscore the importance of institutional quality, prompt feedback, and acceptance of online learning as the “new normal.” The S.T.A.R. factors— technical competency, additional assignment time, teacher preparedness, and time-management challenges – account for a significant portion of satisfaction variance. The study concludes that effective online learning depends on the alignment of student skills, instructor readiness, and institutional support.

**Keywords:** Higher Education, online learning, human resource, Romania.

**JEL classification:** I23, I21, D83, O33, C83.

### Introduction

The outbreak of the COVID-19 pandemic has forced all activity sectors to rapidly adapt and transfer their daily processes to the online environment, universities being no exception. The challenge was even greater for the university environment, as both teaching staff and students found themselves pressured to align with online learning conditions for a series of courses initially designed for traditional teaching delivery methods Muflih *et al.* (2020). El Said (2021) referred to this shift as “the largest online movement in the history of education”, while Esquierdo-Pitogo, Ecle (2021) and Iglesias-Pradas *et al.* (2021) pointed to this situation as “Emergency Remote Learning/ Teaching”.

Although the restrictions imposed by the COVID-19 pandemic are no longer in force and many universities have returned to traditional classes, it is expected that the experience gained during the pandemic will reflect in the development of a hybrid model of education El Said (2021). As a result, to effectively adapt to the needs and expectations of both students and teaching staff, it is important to research and understand their experience with online learning.

Additionally, although academics have turned their attention towards researching the experience of online learning during the pandemic, it should be noted that little data is available to compare the experience of students exposed to traditional teaching (after restrictions were lifted) versus online learning. The present study aims to fill this research gap by presenting the learning experience of undergraduate students in an economic university, both during online and face-to-face teaching processes. Consequently, the study evaluates the students' experiences during online learning (Fall 2020 – Spring 2022) and face-to-face education (Spring 2022/2023).

The paper continues with a section dedicated to the review of the academic literature, based on which objectives and hypotheses are formulated. These are logically followed by the sections that present the research methodology, the research model, and the main findings. Furthermore, the results are discussed, and conclusions are formulated.

### 1. Literature Review

The interest in online teaching in higher education was present among academics even before the COVID-19 pandemic as Kubikova *et al.* (2024) and Mihai *et al.* (2024) indicate. Recent studies also emphasize the increasing role of digital transformation and sustainability in education and service industries (Mocanu *et al.*, 2025). Several authors have referred to the activity of teaching by means of technology, without face-to-face interaction as to online education/teaching Muflih *et al.* (2020); Hjelsvold *et al.* (2020); Svatos *et al.* (2021); Caliph and Lee (2024), online learning Smart and Cappel (2006); Soesmanto and Bonner (2019); Audet *et al.* (2021); Baticulon *et al.* (2021); Choi *et al.* (2021); Alam (2022); Penrod *et al.* (2022); Giday and Perumal (2024); Lin and Wang (2024); Mohammed *et al.* (2022), online distance learning (El Said, 2021); Balalle (2024), remote/distance learning (Al-Mawee *et al.* (2021); Esquierdo-Pitogo and Ecle (2021); Albanyan (2024); Sitar-Tăut *et al.* (2024), distance education (Duan *et al.* (2024); Kubikova *et al.* (2024). All these terms are used interchangeably by the authors without a strong consensus on a single term to describe this way of teaching.

A series of studies have focused on student satisfaction with online education. Smart and Cappel (2006) concluded that students tend to be dissatisfied with online classes unless they were among those who particularly enrolled for a course to be delivered online. Soesmanto and Bonner (2019) found no significant differences in business student satisfaction in the case of a dual mode system for a statistics course, pointing out that students were the ones choosing the way of teaching (online or face-to-face). Muflih *et al.* (2020) highlighted a consistent degree of student dissatisfaction with online teaching during the pandemic, based on the fact that students were not prepared for this change and developed a negative attitude towards this new way of teaching. The focus group conducted by Esquierdo-Pitogo and Ecle (2021) led to a similar conclusion, as the students interviewed preferred teaching methods involving face-to-face interaction. Previous experience with online classes proved to be an important prerequisite for better accommodation with distance learning during COVID-19, this also influencing student satisfaction Penrod *et al.* (2022). Kubikova *et al.* (2024) conducted research on students with two different domains of interest: humanities and technical, showing that the latter tend to be more dissatisfied with online learning since

they lack practical work. Choi *et al.* (2021) developed a focus group on a series of hospitality students, the domain imposing also the development of practical skills. In contrast to the findings presented in other articles, their findings indicated that students had a “moderate to a high level of satisfaction with online classes” (Choi *et al.*, 2021). In their study on bachelor students, Mohammed *et al.* (2022) proved that student satisfaction during online learning relates to the level of consistent interaction between all parties involved, teaching staff and colleagues, as this enhances students’ engagement and consequently positively influences their academic performance. These findings are consistent with those of Sitar-Tăut *et al.* (2024), who concluded that student satisfaction with online learning is negatively influenced by the “perceived social and professional isolation” attributed to this way of studying. In addition, Sitar-Tăut *et al.* (2024) found an indirect connection between the sense of isolation of online students and their dropout intentions. By conducting a thorough literature review, Balalle (2024) emphasizes the importance of maintaining and assessing student engagement during online learning, as well as the role of the teaching staff in constantly monitoring the students’ academic performance. The importance of classroom interaction during online learning and its impact on student satisfaction are also highlighted by Lin and Wang (2024).

Since COVID-19 has been a catalyst for the transition to online learning, academics have researched the barriers found by people involved in the process. Muflih *et al.* (2020), Hjelsvold *et al.* (2020), Baticulon *et al.* (2021), and Duan *et al.* (2024) concluded that most of these barriers are linked to the rapid shift towards a new way of teaching, the lack of previous experience in using online tools, as well as the poor quality of the technological resources used in the process Esquierdo-Pitogo and Ecle (2021). To all of these, Esquierdo-Pitogo and Ecle (2021) add a series of student-related personal barriers, such as the lack of a suitable learning environment, academic barriers related to the student’s ability to process certain information, and personal barriers such as mental/physical health (Baticulon *et al.* (2021); Alam (2022), and also the financial situation. In a study investigating students’ intentions of attending online classes after the end of the pandemic, Giday and Perumal (2024) showed that one of the most important prerequisites is the “ease of use perspective”, since the platforms and methods used in the process must be user-friendly and intuitive.

Advantages were also found for remote learning, the focus group conducted by Esquierdo-Pitogo and Ecle (2021) highlighting that most of them are connected to students being able to “record and review class discussions”, this being more empowering in terms of self-discipline and individual responsibility. Svatos *et al.* (2021) also brought up the need and good practice of prerecording lectures for engineering students and making them available online before the actual lecture, the online class serving to clarify questions raised by students. Choi *et al.* (2021) came to a similar conclusion in the case of hospitality students, showing that providing students access to prerecorded classes allows them to have better control over time management, allowing them to get involved in other activities as well (looking for jobs, having a part-time job, taking optional classes, etc.). Flexibility in time or time savings was an advantage also highlighted by Al-Mawee *et al.* (2021), Caliph and Lee (2024), and Kubikova *et al.* (2024).

In terms of student performance, El Said (2021) found “no significant differences in business students’ grades” when comparing the same courses delivered either in the traditional face-to-face model (before the pandemic), or in the online model (during the pandemic). A similar conclusion was reached by Soesmanto and Bonner (2019), who found no significant differences between student performance in the case of a dual mode system for a statistics course, even though, on average, students attending face-to-face courses tended to perform better compared to online students. However, Al-Mawee *et al.* (2021) developed a study on students from Western Michigan University, indicating that students’ perception is

that their academic performance and success have been negatively impacted by shifting towards distance learning, as their grades did not improve and they were feeling they had been exposed to a better learning environment during face-to-face interaction. On the other hand, Iglesias-Pradas *et al.* (2021) found in their study conducted on engineering students that their academic performance increased while classes were conducted online, compared to the pre-pandemic year, even though the authors stress that possible and probable cheating behaviour was not taken into account.

Students' attitudes and perspectives were also investigated in the context of online learning. Muflih *et al.* (2020) found no differences in the attitude towards online learning between men and women, while El Said (2021) concluded that demographics had no influence whatsoever on the students' performance during online learning. Recent research also highlights how Generation Z students develop distinct expectations and behavioural patterns shaped by digital environments and organisational culture (Diaconescu, 2024). Students' attitudes and perspectives were also investigated in the context of online learning and technology-enhanced education (Djokic *et al.*, 2024). Penrod *et al.* (2022) reached a similar conclusion, as their research did not discover any differences in perception or experience with online learning, considering demographic factors or the subjects studied. However, Caliph and Lee (2024) suggested that cultural differences, as well as the level of the student's engagement with the technologies used in the teaching process, can affect students' preferences for online learning. Kubikova *et al.* (2024) concluded similarly, with their study indicating that women (humanities students) tend to confront themselves with more cases of technical difficulties or communication problems during online learning, compared to men (technical students). Intuitively, Audet *et al.* (2021) proved that personality traits considerably influence the way students manage to adapt to online learning, their openness to experience and conscientiousness being crucial in this case.

Albanyan (2024) studied the quality of online learning during the COVID-19 pandemic, surveying students enrolled in 42 universities located in the Kingdom of Saudi Arabia. The study's results showed that the students accepted the online learning process, as necessary during the pandemic, but their overall perception is that traditional face-to-face interaction teaching methods are far more effective.

## **2. Methodology**

### **2.1. Model Description and Hypotheses**

This research aimed to investigate the elements that influence student satisfaction with online learning compared to traditional teaching methods. Drawing from prior studies, such as those by Hilton *et al.* (2020) and Johnson *et al.* (2000), who stated that students generally perceive face-to-face courses as more satisfying due to better interaction with lecturers and fellow students. However, these studies also highlight a notable shift: As students gain more experience with online courses, their perception tends to evolve, increasingly favoring the online format. Other researchers like Batool *et al.* (2023) underline that accessibility, schedule flexibility, and multimedia resources affect student satisfaction with online learning.

Hilton *et al.* (2020) mention in their research that students' perceptions of their instructors' preparedness and their own technical skills significantly affect their satisfaction with online courses. Other authors like Ali and Ahmad (2011) mention that quality of course materials and the overall learning environment significantly impact student satisfaction (here they included aspects like course design, instructional materials, technology reliability). The quality and relevance of course materials are fundamental to shaping students' perceptions of online instruction, as noted by (Read, 2024). Equally critical is the level

of instructor engagement, which significantly influences the overall learning experience. Furthermore, the availability and effectiveness of online support services play a key role in improving student satisfaction and optimizing learning outcomes.

Taking all of this into account, the authors decided to analyse three main variables: satisfaction with online learning, factors that impacted students' satisfaction with online learning, and the way experiences influenced the satisfaction with the online learning.

To achieve the objectives of the study, three research objectives were formulated and a hypothesis was stated for each of them.

### **Q1. Comparative satisfaction analysis**

Objective: To compare the satisfaction levels of students with online versus traditional teaching methods.

**H1.** Students' satisfaction with online learning and their preference (or motivation) for online learning over traditional teaching methods are positively related in a bidirectional manner; higher satisfaction increases preference/motivation, and stronger preference/motivation also increases satisfaction.

### **Q2. The impact of various factors on student satisfaction with online learning**

Objective: To identify and analyse the key factors influencing student satisfaction with online learning, including the quality of the online learning experience, feedback from professors, adaptation to online education as the 'new normal,' and the lack of face-to-face interaction.

**H2.** Student satisfaction with online learning is significantly influenced by:

- The perceived quality of the online learning experience;
- The frequency and quality of feedback from professors;
- The students' perception of online education as the "new normal"; and
- The lack of face-to-face interaction.

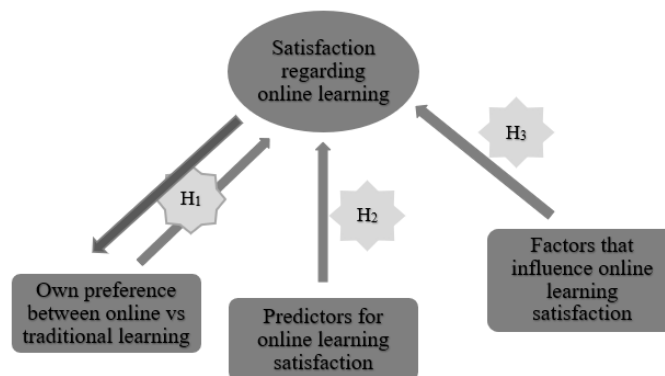
### **Q3. Students' Experiences with the online learning format and their influence on satisfaction with the online learning experience**

Objective: To investigate how specific aspects of the online learning experience contribute to their overall satisfaction.

**H3.** The perceived quality of online teaching experiences, including factors such as the preparedness of professors, increased time for assignments, technical competency of students, and the overall quality of online learning provided by the university, are significant predictors of students' satisfaction with the online teaching-learning experience.

Taking into account the three hypotheses derived from previous studies documented by the literature, the researchers started with the assumption that student satisfaction with online learning is a multifaceted problem, rooted in aspects of daily life related both to intrinsic human nature (motivation) and to independent external factors that cannot be controlled (area of residency) or can be modelled (IT equipment).

The Executive Unit for the Financing of Higher Education, Research, Development, and Innovation (UEFISCDI) conducted a study focusing on the assessment of the students' level of satisfaction regarding the quality of higher education services provided in 2019 and 2020 by the Romanian universities. The study covers, in fact, the last year before the COVID-19 pandemic and the first year of the same pandemic. Some of the main findings indicate that an important barrier to the educational process was represented, on one hand, by the availability of material resources for the acquisition of IT devices (personal computers, laptops, tablets, etc.), and on the other hand, by the fair quality of the Internet connection. Material challenges were reported by nearly a quarter of the respondents in the case of the bachelor programs (female respondents overpassing male respondents by +3.6%) and almost 20% in the case of the master programs (female overpassing male by +1.4%) (Olah *et al.*, 2022: 22).



Source: created by the authors.

Figure 1. Conceptual Model

The same research indicated that Higher Education Institutions (HEIs) encountered many (serious) challenges in their transition to the online educational process. All HEIs faced this situation, including those that had already functional and developed distance learning solutions. The main challenges included the rapid adaptation to online teaching methods, including the provision of adapted study materials. Furthermore, research findings highlight that student adapted efficiently to the online teaching process, given their previous experiences gained while using various educational and communicational digital platforms. The use of the available educational platforms provided students with the opportunity of developing new skills. Overall, students declared themselves satisfied with the manner how universities managed to facilitate and implement the transition to the online educational system. The results of the National Students' Survey indicated a satisfaction level of nearly 46% regarding the way how the HEI managed the transition to digital education (Olah *et al.*, 2022: 24).

## 2.2. Material and Method

To address the objectives of the present study dedicated to the online learning experience and satisfaction during the COVID-19 pandemic, the authors opted for employing a quantitative research approach, developing an adequate survey methodology that enabled data collection and results' analyses. The research methods included a detailed description of the period of application, means of application, sample selection, and data collection methods.

**Period of Application:** Data collection was ensured via a survey distributed among students enrolled at the Bucharest University of Economic Studies, Romania, between April 2022 and March 2023. The spring

of 2022 was the moment that marked the coming back to traditional teaching methods after two years of online educational activities/teaching. Taking into consideration that some of the students experienced only online classes during the bachelor program, the researchers considered that an extended timeframe allowed the capturing of a comprehensive understanding of students' experience of online learning at different stages of the pandemic and the potential differences compared to the traditional model.

**Means of Application:** To conduct the survey, isondaje.ro was identified as a convenient and accessible means of data collection.

**Sample Selection:** For the study, a purposive sampling technique was used to select participants enrolled at the Bucharest University of Economic Studies – Faculty of Business and Tourism which transitioned to online/remote/off-campus learning during the pandemic. The sample consisted of second-year students, enrolled in the bachelor's programs taught in both Romanian and English. A total of 317 surveys were collected, of which 313 were validated. Incomplete responses and those from individuals outside the target group were eliminated. The data were collected in two waves, one in the 2022 spring and one in the 2023 spring.

**Data Collection Methods:** Comprising a total of 61 questions, the survey tool was designed to collect comprehensive data on a wide range of aspects related to the students' perception of online learning experiences, benefits, barriers, and preferences. The questionnaire included both multiple-choice closed-end and Likert scale questions to quantify responses, as well as open-ended questions, to gain qualitative insights.

**Data Analysis:** Once the responses to the survey questions were collected, the data were codified, computed, and, further, analysed using IBM SPSS (v.26). Descriptive statistics methods were employed for the quantitative data analyses, enabling the research team the identification of patterns, trends, and relations among variables.

The research methods used in this study allowed the collection of a comprehensive set of data on students' experiences of online learning during the pandemic. The use of a survey method facilitated the collection of a large amount of quantitative data, which provided a holistic understanding of the impact of online/remote/off-campus/non-traditional learning on students, their preferences, and the challenges they encountered. To test the research hypotheses, multiple linear regression and the interaction test between variables were used.

### 3. Findings

In designing the study, the research team focused on three demographic characteristics that were considered sufficient to test the formulated hypotheses: residential environment, gender, and age. *Table 1* shows the distribution of these characteristics.

The vast majority of the study participants were from urban areas, 42.8% from cities other than Bucharest, 40.9% from Bucharest, with only 16.3% of the respondents being from rural areas. A percentage of 60.4% of the participants were women, while the remaining 39.6% were men. This indicates a somewhat skewed distribution in favor of female respondents. The age distribution shows that most of the respondents were 20 or 21 years old, with very few older participants (only a handful were 22 and older).

The following section highlights the key research findings. These results provide valuable insights into the participants' experiences with online learning (*Table 2*). When analysing the results the authors found out

that audio-video platforms, like Zoom, Google Meet, or Microsoft Teams, were the predominant method for delivering synchronous teaching. Most participants (over 90%) used them frequently or very frequently. This emphasizes the central role of these platforms in facilitating communication and learning in online teaching.

**Table 1. Demographic Distribution by Residential Environment, Gender, and Age**

Variable	Frequency	Percentage
<b>Residential Environment</b>		
Rural	51	16.30%
Urban - Bucharest	128	40.90%
Urban – Other Administrative Areas	134	42.80%
<b>Gender</b>		
Men	124	39.60%
Women	189	60.40%
<b>Age</b>		
20	195	62.30%
21	89	28.40%
22 and higher	29	9.30%

Source: The authors' processing based on research results.

**Table 2. Frequency of audio-video platforms usage**

Frequency with which participants used audio-video platforms	Very rarely	Rarely	Occasionally	Often	Very often
Percentage	1.0%	1.3%	6.4%	10.9%	80.5%

Source: the authors' processing based on research results.

The authors also found that 71.5% of respondents were satisfied or very satisfied with their online learning experience, indicating overall positive feedback. However, almost a fifth (18.8%) were undecided and around 9.6% were dissatisfied to varying degrees (Table 3). Whilst the overall response is positive, there is a small proportion of participants who were less satisfied.

**Table 3. Satisfaction with the teaching-learning experience in an online system**

Satisfaction Level	Very Unsatisfied	Unsatisfied	Indecisive	Satisfied	Very Satisfied
Percentage	2.9%	6.7%	18.8%	31.6%	39.9%

Source: the authors' processing based on research results.

**Table 4. Participants' Perceptions of Teacher Preparedness and Cost Savings in Online Learning**

Agreement Level	Strongly Disagree	Disagree	Neutral/ Indecisive	Agree	Strongly Agree
Professors' Preparedness for Online Teaching (%)	4.8%	11.8%	27.8%	34.8%	20.8%
Cost-Savings Generated by Online Learning (%)	1.9%	2.9%	3.5%	12.1%	79.6%

Source: the authors' processing based on research results.

The results also indicate that most participants (55.6%) felt that their professors were well prepared for online teaching, while a significant proportion (27.8%) were neutral. A smaller but still significant minority (16.6%) felt that teachers were not adequately prepared (Table 4). The vast majority of participants (91.7%) acknowledged that studying online brings significant cost savings, particularly in terms of transport and

accommodation (*Table 4*). This suggests that financial relief was a significant and widely recognized benefit of the online learning format.

A quota of 60.4% of participants did not see the lack of highly performing devices as a major obstacle, while a further 15.0% saw only minor problems in this respect. However, a notable minority (12.8%) faced significant challenges due to inadequate technology, suggesting that while most students were well-equipped for online learning, some struggled with device-related limitations (*Table 5*).

**Table 5. Participants' Experiences with Device Limitations and Overwhelming Workload during Online Studies**

Level	Very Small Extent	Small Extent	Moderate Extent	Large Extent	Very Extent	Large
Device Limitations (%)	60.4%	15.0%	11.8%	5.8%	7.0%	
Overwhelming Workload (%)	18.2%	22.7%	32.6%	17.6%	8.9%	

Source: the authors' processing based on research results.

While a significant proportion of the participants (40.9%) did not perceive the workload as excessive, a significant group (32.6%) felt moderately pressured (*Table 5*). Importantly, approximately 26.5% of the respondents perceived the workload as high or overwhelming, meaning that more than a quarter of students found the academic demands of online study stressful.

While most participants (64.2%) felt a low or very low level of sadness during the online study, a significant proportion of respondents (21.1%) felt a significant level of sadness (*Table 6*). This suggests that the transition to online learning did not present significant emotional challenges for many students but for a substantial minority, sadness and emotional distress were a serious problem.

A large share of the respondents (70.3%) reported that they encountered little to no difficulties in adapting to the online learning system, suggesting a relatively smooth transition for most (*Table 6*). However, a significant proportion (17.6%) had moderate adjustment difficulties and approximately 12.1% had major or very major adjustment difficulties.

**Table 6. Participants' Experiences of Sadness and Adaptation Difficulties during Online Learning**

Level	Very Small Extent	Small Extent	Moderate Extent	Large Extent	Very Extent	Large
Sadness (%)	47.3%	16.9%	14.7%	10.2%	10.9%	
Adaptation Difficulties (%)	53.0%	17.3%	17.6%	5.1%	7.0%	

Source: the authors' processing based on research results.

Most participants (68.1%) felt that the online evaluation system was fair, with 43.8% strongly disagreeing with the concept of unfairness (*Table 7*). However, a smaller but notable proportion of respondents (14.7%) considered the evaluation system unfair, while 17.3% were neutral.

**Table 7. Participants' Perceptions of the Fairness of the Online Evaluation System**

Level	Strongly Disagree	Disagree	Neutral/ Indecisive	Agree	Strongly Agree
Percentage	43.8%	24.3%	17.3%	8.0%	6.7%

Source: the authors' processing based on research results.

Regarding the research questions our study on online learning during the pandemic yielded several significant findings regarding the impact of distance learning on students, their experiences, and their preferences. A summary of the most important results can be found in *Table 8*.

**Table 8. Summary of Key Regression Analysis Results on Factors Influencing Online Learning Satisfaction and Preferences**

Research questions	Dependent Variable	Independent Variable	R-Square	Unstandardized Coefficient (B)	Significance (p-value)
Q1	Preference for online learning vs traditional teaching	Satisfaction with online learning	0.080 (8%)	0.189	0.000
	Satisfaction with online learning	Preference for online learning vs traditional teaching	0.080 (8%)	0.422	0.000
Q2	Satisfaction with online learning	(a) Online Learning Satisfaction Predictors*	0.541 (54.1%)	0.332	0.000
		(b)		-0.153	0.000
		(c)		0.141	0.004
		(d)		0.238	0.000
Q3	Satisfaction with online learning	(e) S.T.A.R. Factors**	0.502 (50.2%)	0.233	0.001
		(f)		0.336	0.000
		(g)		0.284	0.000
		(h)		-0.126	0.000

Notes: \*The predictors are: (a) university offered a high-quality online learning experience; (b) face-to-face interaction facilitates easier understanding compared to online; (c) quick feedback from professors during online activities; (d) preference for online education as the “new normal”. \*\*The predictors are: (e) technical competency; (f); resource time; (g) teacher preparedness to teach online; (h) self-management challenges.

Source: the authors’ processing based on research results.

To test the first hypothesis ( $H_1$ ), a series of analyses were conducted to examine the relationship between students’ satisfaction with online learning and their preference for this learning format over traditional teaching methods. The authors assumed that the two variables have a bidirectional effect upon each other. To confirm this aspect, a linear regression was performed in which each variable played the role of a dependent and an independent variable.

Firstly, “satisfaction” was considered as an independent variable. The results showed that the regression model was statistically significant,  $F(1.311) = 26.987$ ,  $p < 0.001$ , indicating that satisfaction significantly influences the preference for the learning format. However, the model explained only a small part of the variance,  $R^2 = 0.080$ , meaning that satisfaction explained about 8% of the variance in students’ preference for learning formats. Satisfaction with online learning was a significant positive predictor ( $B=0.189$ ,  $p < 0.001$ ), meaning that higher satisfaction with online learning experiences was associated with a higher preference for online learning. This conclusion was also reached by Nurteti *et al.* (2024), Keskin and Yurdugül (2019), and Gaba *et al.* (2021).

Secondly, the researchers considered “satisfaction” as a dependent variable. In this case, too, the analysis revealed that the regression model was statistically significant,  $F(1.311) = 26.987$ ,  $p < 0.001$ , indicating that preference for learning format is a significant predictor of satisfaction. However, the model explained only 8.0% of the variance in satisfaction ( $R^2 = 0.080$ ), suggesting that other factors may contribute significantly to satisfaction. The preference for the learning format ( $B = 0.422$ ) had a significant positive effect on

satisfaction. For every one unit increase in the preference for online learning, satisfaction increased on average by 0.422 units. The same conclusion was reached by Xi *et al.* (2020), who mention in their study that the learning format (e-learning vs. traditional learning) has a significant impact upon students' experience and satisfaction.

Even though the research results indicate a statistically significant result, the authors must prove that there is a bidirectional relationship between the variables analysed, thus, a "test for interaction between variables" was further performed. In his article, Dawson (2021) emphasizes that it is not enough to simply find a significant result without examining how the variables interact. To test the interaction between the variables, an "interaction" variable was created by multiplying the two variables (satisfaction \* preference). In the next step, a linear regression analysis was conducted to examine the influence of the "interaction variable" on the preference for traditional versus online learning activities. The model was significant ( $F(1.311) = 674.204$ ,  $p < 0.001$ ) and explained 68.4% of the variance of the dependent variable ( $R^2 = 0.684$ ).

A linear regression analysis was also conducted to examine the influence of the "variable interaction" on satisfaction with the online learning experience. The model was statistically significant ( $F(1.311) = 370.886$ ,  $p < 0$ ) and explained 54.4% of the variance in satisfaction ( $R^2 = 0.544$ ). The bidirectional nature of the analyses suggests that the "interaction" influences both satisfaction and preference, which in turn could influence each other.

The analysis confirms hypothesis H1, which indicates a bidirectional relationship between students' satisfaction with online learning and their preference/motivation for this learning format. Higher satisfaction significantly predicts a higher preference for online learning, while the preference for online learning also has a positive effect on satisfaction. These results are supported by the regression analyses and the tests for interaction.

To test the second hypothesis (H2), a multiple regression analysis was performed to examine the influence of various factors – such as the perceived quality of the online learning experience, feedback from professors, adaptation to online teaching as the 'new normal', and the lack of face-to-face interaction – on students' satisfaction with online learning. The aim was to find out to what extent these factors contribute significantly to overall satisfaction. The multiple regression analysis revealed that the four key factors that were considered significantly predicted students' satisfaction with online learning and explained 54.1% of the variance in satisfaction scores ( $R^2 = 0.541$ ,  $p < 0.001$ ).

In particular, the desire for online learning to become the "new normal" ( $B = 0.238$ ,  $p < 0.001$ ) and the perceived quality of the university's online learning provision ( $B = 0.332$ ,  $p < 0.001$ ) were the strongest positive predictors, suggesting that students with a positive attitude towards online learning as the default method and those who rated their institution's online provision highly reported greater satisfaction. Other studies also come to the same conclusion, such as Çakmakkaya *et al.* (2024), Tian and Lu (2022) and Spricigo *et al.* (2023).

In addition, the provision of prompt feedback from lecturers ( $B = 0.141$ ,  $p = 0.004$ ) had a positive effect on satisfaction, which emphasizes the importance of interaction and responsiveness in the online environments. For example, Händel *et al.* (2022) mention in their study that visual engagement through webcams improves interaction and feedback, which is essential for effective learning. Mohammed *et al.* (2022) emphasize that prompt feedback is a key factor for higher satisfaction in online learning environments. Conversely, the preference for face-to-face instruction to better understand the concept ( $B = -0.153$ ,  $p < 0.001$ ) had a negative effect on satisfaction, possibly indicating the perceived limitations of

online formats for teaching complex content. Similarly, Mukhtar *et al.* (2020) found that students prefer face-to-face instruction considering that they can better understand a challenging material.

The Durbin-Watson statistic value of the model (1.984) indicates that there is no autocorrelation in the residuals, which confirms the assumption of independence according to Rehal (2024). These results emphasize that students' satisfaction with online learning is multi-faceted and is influenced by both their personal preferences and the quality of institutional support. They highlight areas where the online learning environment can be improved to further increase students' satisfaction.

The results confirm hypothesis H2 and show that satisfaction with online learning is significantly influenced by key factors including the perceived quality of the online learning experience, the provision of prompt feedback from professors, the view that online learning is the "new normal", and the lack of face-to-face interaction. Each predictor contributes uniquely to the overall satisfaction, with institutional support and prompt feedback playing a particularly central role.

To test the third hypothesis (H3), a multiple linear regression test was performed to find out whether there is a relationship between the "S.T.A.R. factors" as an independent variable and "satisfaction with online learning" as a dependent variable. The regression model shows that about 50% of the variance in students' satisfaction with online learning is explained by four key factors: technical competency, extra time for projects, teacher preparedness, and time management difficulties. The model indicates a strong statistical significance ( $F = 77.74$ ,  $p < 0.001$ , and  $R^2 = 0.502$ ) between the predictors and satisfaction.

Each predictor contributes to satisfaction in a unique way: Perceived technical competency ( $\beta = 0.233$ ,  $p < 0.001$ ), availability of additional time for documentation and projects ( $\beta = 0.336$ ,  $p < 0.001$ ), and teacher preparedness to teach online ( $\beta = 0.284$ ,  $p < 0.001$ ) all positively influence satisfaction. Conversely, difficulties with time management significantly reduce satisfaction ( $\beta = -0.126$ ,  $p = 0.001$ ). The collinearity diagnosis shows that multicollinearity is within acceptable limits ( $VIF < 1.5$  for all predictors), ensuring the unique contribution of each variable to the model, as mentioned by Kim (2019) who emphasizes the importance of ensuring that the VIF is below critical thresholds (value equal to or greater than 5). The Durbin-Watson statistic value (1.855) indicates a minimal autocorrelation in the residuals, supporting the validity of the model (Rehal, 2024).

These results suggest that satisfaction with online learning is enhanced by a strong alignment between student ability, course design and instructor readiness, while personal barriers such as time management remain a significant obstacle in students' satisfaction as noted by Spricigo *et al.* (2023) in their article.

The results confirm hypothesis H3 and show that the S.T.A.R. factors (technical competency, additional project time, teacher readiness, and time management challenges) significantly influence students' satisfaction with online learning. Together, these factors explain a significant proportion of the variance in satisfaction and emphasize the importance of course design, instructor preparedness and students' personal competencies in creating positive online learning experiences.

### Conclusion and Discussion

This study on online learning during the COVID-19 pandemic examined demographic characteristics, satisfaction and perceptions of online learning during the pandemic, aligning with existing literature on the shift to e-learning during crises like Keskin and Yurdugül (2019), Mukhtar *et al.* (2020). The sample was predominantly urban (83.7%), with most participants coming from Bucharest or other cities. Women (60.4%) were somewhat overrepresented, and the majority of the respondents were 20 years old (62.3%).

Audio-video platforms such as Zoom were central to online learning, with over 90% of the sample members using them frequently, consistent with findings by Mohammed *et al.* (2022) on the pivotal role of such platforms. The overall satisfaction with online learning was high (71.5%) but 9.6% expressed dissatisfaction, while 18.8% were undecided, reflecting varied experiences as also documented by Tian and Lu (2022). Most participants (55.6%) felt that their teachers were well prepared and 91.7% admitted cost savings, echoing the conclusions of Gaba *et al.* (2021) related to the economic benefits of online learning. However, 12.8% struggled with device-related challenges and 26.5% reported an overwhelming workload. It is worth noting that infrastructure plays a crucial role in online learning. Haleem *et al.* (2022) emphasize that the lack of devices and internet connections significantly affects the learning experience for many students, resulting in lower satisfaction. It is also worth noting that emotional and adjustment difficulties were identified. Nearly a fourth of the respondents (21.1%) felt very sad and 12.1% encountered major adjustment problems during the online activities.

Regression analyses revealed important factors that influence satisfaction and preferences. Satisfaction positively influenced preferences for online learning ( $R^2 = 0.08$ ), while institutional support and attitudes explained 54.1% of the variance in satisfaction ( $R^2 = 0.541$ ). S.T.A.R. factors such as technical competency and faculty readiness contributed significantly ( $R^2 = 0.502$ ), while time management difficulties reduced satisfaction, similar to the findings of Çakmakkaya *et al.* (2024). These findings emphasize the need to improve faculty readiness, address workload issues and provide adequate technical support to enhance the online learning experience. Although online learning was effective for many, targeted interventions are essential to address the areas of dissatisfaction and emotional challenges.

### **Theoretical Implications**

Your study contributes to reciprocal causality models in education, strengthens frameworks like Community of Inquiry, and empirically validates the STAR model in the online learning context. By testing the interaction effect, your study advances prior research that often stops at correlation or one-directional causality, providing stronger evidence for interactionist perspectives in online learning. Also, our finding that perceived quality of provision and feedback are the strongest predictors of satisfaction supports theories of social presence and instructional design in online learning. It extends existing models by showing that institutional readiness (quality provision + “new normal” mindset) explains a substantial proportion of satisfaction variance, beyond individual learner differences. The results provide empirical support for the STAR framework, demonstrating its explanatory power for student satisfaction. The interplay between technical competency, time management, and teacher readiness aligns with self-regulated learning theories and technology acceptance models, reinforcing the idea that both student skills and institutional design are needed for optimal online learning experiences. The inclusion of time management difficulties as a negative predictor emphasizes the role of personal constraints in online learning success, which is less developed in current theory.

### **Practical Implications**

Universities and educators should prioritize institutional support, feedback, teacher readiness, and workload management while also equipping students with competencies for self-directed online learning. Universities should invest in improving the quality of online provision (platform reliability, accessibility, course design), including AI-based adaptive learning solutions that support personalised learning paths (Bobocea *et al.*, 2024), since it is a strong predictor of satisfaction but also allocate resources to faculty development programs that focus on teacher preparedness, digital pedagogy, and responsive feedback

practices. On the other hand, teachers should provide prompt and meaningful feedback to maintain high satisfaction levels, ensuring students feel supported and engaged and actively address time management issues by designing realistic workloads, offering flexible deadlines, and providing training in self-regulation strategies. For students who prefer in-person formats, teachers can incorporate strategies that simulate aspects of face-to-face interaction (e.g., live discussions, breakout rooms, webcam engagement). This is in line with recent evidence on how prestigious European universities adapt their curricula to new societal and regulatory demands (Ionescu-Feleaga *et al.*, 2025). Policymakers should support policies that expand digital infrastructure access (devices, stable internet) to reduce inequalities that undermine satisfaction with online learning and fund initiatives that encourage teacher readiness in digital environments, recognizing its direct impact on student experience.

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## NUO KRIZĖS REŽIMO IKI PASIRINKIMO: VEIKSNIAI, LEMIANTYS STUDENTŲ PASITENKINIMĄ NUOTOLINIU ŠVIETIMU

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*Santrauka.* Straipsnyje nagrinėjamas bakalauro studijų studentų pasitenkinimas nuotoliniu mokymusi, lyginant jį su tradiciniu ekonomikos dėstyto universitete Rumunijoje. Pasitelkus 313 antro kurso studentų apklausos duomenis, surinktus nuo 2022 m. balandžio iki 2023 m. kovo mėn., analizuojamas studentų pasitenkinimo lygis, suvokiamos kliūtys ir nauda bei veiksniai, prognozuojantys pasitenkinimą ir teikiantys pirmenybę nuotoliniam mokymuisi. Rezultatai parodė, kad bendras studentų pasitenkinimas yra gana aukštas (apie 70 %). Jis reikšmingai susijęs su garso ir vaizdo platformų kokybe bei suvokiamu išlaidų taupymu. Tačiau taip pat išryškėjo tam tikri iššūkiai – su įrenginiais susiję sunkumai, kai kuriems studentams padidėjęs darbo krūvis ir nedidelei daliai – emociniai sunkumai. Regresinė analizė atskleidė dvikryptį ryšį tarp pasitenkinimo ir pirmenybės nuotoliniam mokymuisi. Pabrėžtina institucinių paslaugų kokybės, greito grįžtamojo ryšio ir nuotolinio mokymosi kaip „naujos normos“ priėmimo reikšmė. STAR veiksniai – studentų techniniai gebėjimai, papildomas laikas užduotims, dėstytojų pasirengimas ir laiko valdymo sunkumai – sudaro maždaug pusę pasitenkinimo skirtumų. Straipsnyje daroma išvada, kad nors nuotolinis mokymasis gali būti veiksmingas ir vertinamas daugelio studentų, pasitenkinimas priklauso nuo studentų įgūdžių suderinamumo, dėstytojų pasirengimo, kurso struktūros ir institucinės paramos. Pabrėžiama, kad reikia imtis tikslinių priemonių, skirtų darbo krūviui mažinti, pažeidžiamiems studentams remti ir skaitmeninei infrastruktūrai stiprinti.

*Reikšminiai žodžiai:* aukštasis mokslas; nuotolinis mokymasis; žmogiškieji išteklių; Rumunija.