




Students' Satisfaction with Online and Traditional Teaching

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Abstract: *Students' satisfaction in higher education is a multifaceted concept that encompasses a wide range of factors influencing the overall student experience. Universities place significant importance on understanding and measuring this satisfaction as it provides essential insights into the effectiveness of their academic offerings and support services. By focusing on students' satisfaction, institutions can identify areas for improvement and tailor their approaches better to meet the diverse needs and expectations of their students. This paper compares students' satisfaction with online and traditional teaching methods at two technical faculties in the Republic of Serbia. The study involved 259 students who completed a questionnaire with closed questions in digital format using Google Forms surveys. Research findings indicate that students reported higher satisfaction with classroom teaching ($M=3.994$, $SD=0.91145$) compared to online teaching ($M=3.8319$, $SD=0.91832$), although the difference is relatively small. The factors that most significantly influence students' satisfaction with teaching include clearly defined assessment criteria, feedback on assignments, availability of literature in digital repositories, and the practical application of knowledge to solve real-world problems. The limitation of this study is that it focuses solely on students' perceptions, disregarding perceptions of other stakeholders.*

Keywords: *Students' satisfaction; higher education; online teaching; traditional teaching; technical faculty*

1. INTRODUCTION

Higher education is considered a pivotal driver for personal development as well as the social and economic progress of a country [1, 2]. This is reflected in current European policy guidelines, which focus on increasing the percentage of citizens holding higher education qualifications, whether through initial education or by enhancing professional competencies [1]. Higher education promotes innovation and creativity by generating and sharing knowledge, while also equipping students with essential skills to tackle future challenges.

Nowadays, the higher education sector is significantly influenced by globalization, intensifying competition among institutions. To stand out from their competitors and attract as many students as possible, higher education institutions are adopting market-oriented strategies to meet the needs and expectations of their primary stakeholders – the students [2, 3]. Students' satisfaction has become indispensable for the success of every higher education institution.

In recent years, higher education has experienced significant transformation with the growing prominence of online education alongside traditional teaching methods. This shift reflects a

profound change driven by technological advancements and evolving student preferences [2]. The rise of online education as a viable alternative to traditional face-to-face methods has been accelerated by technological progress and the need to adapt to evolving circumstances, such as the COVID-19 pandemic, highlighting the importance of flexible and accessible learning options.

Understanding the dynamics between online and traditional education is crucial for exploring how institutions can effectively meet the diverse needs of today's learners while ensuring quality and inclusivity in higher education [1, 2, 4].

2. STUDENTS' SATISFACTION

Satisfaction is defined in various ways, but a common feature across all definitions is that it is founded on relationships where comparison and evaluation occur.

Satisfaction is defined as a „feeling of happiness that is obtained when a person fulfills his or her needs and desires“ [2, p. 533]. The sense of pleasure or disappointment that arises from comparing the perceived performance with one's expectations. Satisfaction is a function of the relative level of expectation linked to people's

perceptions. When a person perceives that the service encountered is good, they will be satisfied. Conversely, dissatisfaction arises when their perception conflicts with their service expectations [6]. Therefore, satisfaction is the perception of a service's pleasurable fulfillment of a service and is a complex mix of cognitions, emotions, and behavioral tendencies [2, 3, 5, 7].

If this definition is applied to students and universities, then students' satisfaction refers to the level of contentment or fulfillment experienced by students in their educational experience within an institution [3, 5, 6]. In ref. [2, p. 533], students' satisfaction is defined as a "short-term attitude" arising from the evaluation of their educational experiences. This is because it reflects a current evaluation of the educational experience. It is influenced by immediate factors such as the quality of teaching, facilities, administrative support, and social interactions. These elements can change over time, affecting how students perceive their satisfaction levels. Furthermore, as students advance in their academic careers, their expectations and requirements may change, influencing how satisfied they are with their educational institution. Therefore, student satisfaction is dynamic and can vary depending on continuous experiences and interactions within the educational environment.

Students' satisfaction is a positive precursor to students' loyalty and reflects the results and outcomes of the educational system [4, 5, 6]. Loyalty is demonstrated when students show interest in pursuing further studies (such as master's or PhD programs) at the same institution and are willing to recommend it positively to others, including prospective students and partners of the faculty. This, in turn, enhances the institution's public reputation [6]. High students' satisfaction boosts the institution's reputation, attracting new students and increasing applications, which are vital for financial stability and long-term growth [1, 4, 5]. Additionally, satisfied students actively participate in classes, effectively utilize institutional resources, and achieve superior learning outcomes, thereby promoting academic excellence and maintaining high educational standards [3, 4]. Satisfied students also enjoy improved prospects for employment and successful careers after graduation.

Students' satisfaction in higher education is a complex concept that includes many aspects of the student experience. It is an important measure for universities that want to improve their academic programs and support services. By thoroughly understanding the factors that contribute to student satisfaction, universities can make specific improvements to create a better environment for learning and support. Students' satisfaction is a key

determinant of student loyalty and the spread of positive word-of-mouth, which influences the perception of the institution and its future success.

1.1. Measurement of students' satisfaction

Students' satisfaction is a multidimensional process and it is influenced by various personal and institutional factors [2]. Understanding what those factors are and how they combine to influence students' satisfaction is critical to educators who believe that student satisfaction, in addition to learning, is a desired outcome of their efforts [6, 8]. Key personal factors include grade (GPA), age, gender, employment and learning style. Institutional factors encompass the quality of instruction, feedback, expectations, teaching style, lecturers, physical facilities and technology use. Additionally, classroom quality, feedback, relationships with lecturers and peers, course content, learning resources, library facilities and overall campus climate significantly impact satisfaction. Other determinants include teaching ability, curriculum flexibility, university prestige, student growth and institutional effectiveness.

Measuring student satisfaction typically involves using various models and methods to gather feedback and assess students' perceptions of their educational experience. Researchers have devoted considerable efforts over the past few decades to enhance student satisfaction in higher education, utilizing diverse frameworks and models across various dimensions [2]. They initially adapted industry-based satisfaction models and later refined them specifically for higher education settings. These models, with their varied dimensions, have been implemented worldwide, revealing both conflicting and consistent relationships with student satisfaction in different contexts. Some of these models are:

- SERVQUAL model is a most popular widely used service quality model that has been applied to measure students' satisfaction around the world [2, 6]. It is developed in 1985 for business environments, it assesses service quality across five dimensions: tangibility, reliability, empathy, responsiveness, and assurance [2].
- The HEDPERF model was developed in 2005, and it is designed specifically for higher education, focusing on service quality dimensions such as teaching, learning, infrastructure, and support services [9, 2].
- The SAMR model (Substitution, Augmentation, Modification, Redefinition) was developed in 2006 and it assesses how technology is integrated into education, impacting student learning outcomes and satisfaction by categorizing levels from basic substitution to transformative redefinition of tasks and activities [10].

3. TRADITIONAL VS. ONLINE TEACHING

Educational theory and practice have undergone significant transformations in recent decades, driven by numerous societal changes. The COVID-19 pandemic has notably underscored the critical necessity for flexibility and adaptability in education [1, 7]. It forced educators and institutions to rethink traditional teaching methods and quickly adopt new strategies to ensure the continuity of learning. This period of rapid change emphasized the importance of integrating innovative approaches, such as online learning, to meet the diverse and evolving needs of students [1, 2, 7]. Educators worldwide have been compelled to incorporate technology into their teaching methods, regardless of their initial preparedness or preferences.

Technological advancements have provided educational institutions with opportunities to deliver educational content online, marking a shift from traditional in-person classroom lectures to electronic delivery methods.

Traditional and online teaching represent distinct educational approaches, each offering unique characteristics and benefits. Traditional teaching typically refers to the conventional methods of instruction that have been practiced in classrooms for decades. It involves face-to-face interaction between teachers and students in physical classrooms. In traditional teaching, the focus often lies on direct instruction, where educators convey knowledge through in-person lectures, discussions and interactive activities. Online teaching refers to the delivery of educational content and instruction via the internet or digital technologies, often outside of traditional physical classroom settings. This approach allows students to participate in learning activities remotely, accessing course materials, lectures and assessments through online platforms. Online teaching methods typically include video lectures, interactive assignments, discussion forums and virtual simulations. It provides flexibility in scheduling and access to resources, accommodating diverse learning styles and allowing for personalized learning experiences. Virtual classroom meetings facilitate interaction between teachers and students, as well as among students themselves.

The acceptance of online education by students is crucial for success of teaching process. If it is well-received and proves effective in achieving learning outcomes, increasing lectures in this format makes sense. If online teaching is poorly received and results in shallow learning or partial student engagement, institutions, where feasible, should prioritize classroom-based teaching [6].

Both traditional and online teaching methods have their advantages and are often integrated in blended learning approaches to leverage their

respective strengths and enhance student learning outcomes. Blended learning is a new approach to teaching and learning created by combining traditional classroom learning with an online learning platform. In recent years, blended learning has become an increasingly popular form of e-learning. It is particularly suitable for transition from completely traditional forms of learning to online learning [7].

4. RESEARCH METHODOLOGY

In the past four years, after COVID-19 pandemic, several studies have explored student satisfaction with online teaching and compared it with traditional teaching. These studies revealed that students' satisfaction with online teaching is influenced by various factors such as access to technological resources, motivation, life circumstances, socio - emotional support, availability of materials, type of studies, and the inability to engage in practical exercises. Differences in satisfaction were also observed across countries; for instance, students in China and India reported high satisfaction rates (80.29%), whereas students in Jordan reported lower rates (26.77%) [1]. Additionally, research indicates that instructors of online courses received lower ratings compared to those teaching in traditional face-to-face settings, suggesting that the shift from conventional to online methods reduces student satisfaction with instruction [6].

This raises the question of whether face-to-face lectures in the classroom lead to greater student attention and better understanding compared to online lectures delivered through increasingly advanced technical presentations.

The aim of the survey is to explore and compare students' satisfaction with traditional teaching and online teaching based on the perceptions of students at two technical faculties in the Republic of Serbia, Faculty of Technical Sciences in Čačak and Technical Faculty „Mihajlo Pupin“ in Zrenjanin.

Hypothesis:

- H1: Satisfaction of students with traditional teaching is higher than satisfaction with online teaching.
- H2: There is a statistically significant difference in the level of satisfaction with online teaching and teaching in the classroom between students who had some course online and those who did not.
- H3: There is a statistically significant difference in the levels of students' satisfaction with online teaching and teaching in the classroom between students at different years of studies.

After the COVID-19 pandemic, teaching approaches at several higher education institutions varied: some embraced online or hybrid models, while others continued with traditional face-to-face

teaching. This study focuses on students from technical faculties because the use, understanding, and development of new technologies are essential parts of their education.

The questionnaire had three parts. The first part of the questionnaire was dedicated to general questions about students (faculty, year of study, study program, age, gender and their experience with online teaching). The second part comprises from factors that could influence satisfaction with teaching, which was adapted from ref. [11]. Third part was dedicated to students' satisfaction with online and teaching in the classroom, and items used in this part were adapted from [6].

Satisfaction with online teaching was measured using 9 items, where 2 items referred to teaching support, 2 items referred to teaching organization, 3 items referred to personal accomplishment and 2 items referred to teachers' skills. Satisfaction with teaching in the classroom was measured using 10 items, where 2 items referred to teaching support, 3 items referred to teaching organization, 3 items referred to personal accomplishment and 2 items referred to teachers' skills.

All items were rated on a five-point Likert-type scale ranging from 'strongly agree' to 'strongly disagree'.

Data were collected between May and June 2024 using Google Forms polling. Students were invited to participate in the research through announcements on Moodle, MS Teams, and Google Classroom. They were informed about the research's general aim, the anonymity of their answers and the voluntary nature of their participation.

Data analysis was conducted using the SPSS program. Descriptive statistics, independent samples t-tests and one-way ANOVA were done. Cronbach's alpha coefficient was calculated to assess the reliability of the variables.

A total of 259 students participated in the study. The structure of the respondents is presented in Table 1. There were 52.1% of students from the Faculty of Technical Sciences in Čačak and 47.9% of students from Technical Faculty "Mihajlo Pupin" in Zrenjanin from Serbia. Male students accounted for 56.4% of the sample, while female comprised 43.6%. The most students were 20-22 years old (63.7%). Regarding the study programs, 50% of students were enrolled in the Information Technology program, 26.6% of students were enrolled in the Management program, and other study programs were much less represented in the sample. Regarding the year of studies, 48.3% of students participated in the research were at second year of studies, 20.8% of students were at fourth year of studies. When asked if they had experience with online teaching, 47.1% of students said that they were enrolled in at least one subject which was held completely online. Hybrid model of

teaching means that some lectures were presented in the classroom and for some lectures was used some kind of online teaching platform (for teaching or as a support for teaching). There were 28.2% of students who had some subjects in hybrid form. One quarter of students did not have any online course during their studies.

Table 1. The sample structure

Variables	Criterion	%
Sex	Male	56.4
	Female	43.6
Age	Less than 20 years	13.1
	20 to 22 years	63.7
	23 to 25 years	18.1
	More than 26	5
Year of studies	First	17.4
	Second	48.3
	Third	13.5
	Fourth	20.8
Study program	Information technology	50.2
	Management	26.6
	Electrical Power Engineering	1.2
	Mechatronics	0.4
	Computer and Software Engineering	5.4
	Environmental protection Engineering	6.2
	Clothing Engineering and Design	1.5
	Industrial Engineering in Oil and Gas Exploitation	5.8
	Mechanical Engineering	2.7
Faculty	Faculty of Technical Sciences Čačak	52.1
	Technical Faculty "Mihajlo Pupin" Zrenjanin	47.9
Experience with online teaching	At least one subject completely online	47.1
	Hybrid model	28.2
	All subject in the classroom	24.7

5. RESEARCH RESULTS

The reliability analysis for the Satisfaction with online teaching scale and Satisfaction with teaching in the classroom scale was assessed using Cronbach's alpha coefficient. Cronbach' alpha coefficient for the Satisfaction with online teaching scale was 0.956, while Cronbach' alpha coefficient for the Satisfaction with teaching in the classroom scale was 0.961, meaning high internal consistency (above the recommended value of 0.7). This analysis had proven good reliability and internal consistency of the scales for the sample used in this study.

Kolmogorov-Smirnov test of normality of distribution for students' satisfaction with online teaching was 0.102, $p=0.000 < 0.05$. Kolmogorov-Smirnov test of normality of distribution for

students' satisfaction with teaching in the classroom was 0.135, $p=0.000 < 0.05$, which means that the assumption of normal distribution was not fulfilled for these variables. The distribution of values for satisfaction with teaching in the classroom was moved right from the mean value (-0.720), and it was lower than normal (-0.289). The distribution of values for satisfaction with online teaching was moved right from the mean value (-0.497), and it was lower than normal (-0.526). The Normal Q-Q plots showed good distribution of results and there were not any non-typical dots.

Descriptive analysis was conducted for all variables, including factors of satisfaction with teaching and students' satisfaction with online and teaching in the classroom. The results are presented in Table 2.

Table 2. The results of descriptive statistics

Factors influencing students' satisfaction with teaching	Mean	Std. Dev.	Var.
Availability of literature in digital repositories	4.36	0.930	0.866
Availability of literature in paper form	3.81	1.263	1.596
Technical support and equipment used in teaching	4.06	0.982	0.965
Independence in learning, in accordance with one's own pace, motives and time	4.17	0.947	0.896
Interaction with the teachers	4.15	1.067	1.139
Interaction with colleagues	4.02	1.073	1.151
Availability of professors and assistants	4.36	0.944	0.891
Clearly defined assessment criteria	4.50	0.886	0.786
Feedback on assignments	4.37	0.921	0.848
Connection between theory and practice and the application of knowledge to solve real problems	4.36	0.918	0.843
Final grade in the subject	4.02	1.071	1.147
Students' satisfaction			
Satisfaction with teaching in the classroom	3.9940	0.91145	0.831
Satisfaction with online teaching	3.8319	0.91832	0.843
Online teaching variable			
Teaching support	3.9286	0.93578	0.876
Teaching organization	3.7683	1.02885	1.059
Personal accomplishment	3.7426	1.01487	1.030
Teachers skills	3.8880	0.98389	0.968
Traditional teaching variables			
Teaching support	4.0463	1.00569	1.011
Teaching organization	4.0212	0.95262	0.907
Personal accomplishment	4.0193	0.95238	0.907
Teachers skills	3.8893	1.00589	1.012

Considering factors influencing students' satisfaction with teaching in general, the most important were clearly defined assessment criteria ($M=4.5$, $SD=0.886$), feedback on assignments ($M=4.37$, $SD=0.921$), availability of literature in digital repositories ($M=4.36$, $SD=0.93$) and connection between theory and practice and the

application of knowledge to solve real problems ($M=4.36$, $SD=0.918$). The least important was technical support and equipment used in teaching ($M=3.81$, $SD=1.263$). But, when we consider all factors together, it can be concluded that almost all listed factors are highly significant for students' satisfaction with teaching. These findings are consistent with other research. García-Aracil's study (cited in [2]) on students' satisfaction across eleven European countries identified interactions with colleagues, course content, availability of learning equipment, library resources, teaching quality, and teaching materials as key factors influencing students' satisfaction. Students appreciate transparency in the assessment of their knowledge and seek a clear connection between lectures, tutorials, practical classes and subject resources. They need to know exactly what is expected of them to demonstrate in the course. They also want to understand the criteria for grading and expect timely feedback that [11, p. 107]: "explains their grade, acknowledges their accomplishments, provides suggestions for improvement, and can be used within the subject or course."

Despite the existence of online education before Covid-19, during the crisis it became the primary mode of teaching. The most of online teaching platforms continued to be used later on as either primary or supplementary tools in education. When considering available options for online teaching, students most frequently used Google's suite (Google Classroom, Google Chat and Google Meet), by almost 42% of them. Microsoft Teams and Moodle were utilized by 41% of students, while Zoom was used by 23% of students and Skype being used in a few cases.

Research findings suggest that students were more satisfied with teaching in the classroom ($M=3.994$, $SD=0.91145$) than with online teaching ($M=3.8319$, $SD=0.91832$), but that difference is not very big. These findings confirm our H1 hypothesis. Our findings are consistent with the results of previous study [12], which reported a slight preference among students for traditional educational formats over distance education formats, with minimal disparity in satisfaction levels.

The data reveals that traditional teaching received slightly higher ratings for support ($M=4.046$), organization ($M=4.021$) and personal accomplishment ($M=4.019$) compared to online teaching, where support received $M=3.929$, organization received $M=3.768$, accomplishment received $M=3.742$. When contrasting our findings with those from [6], it becomes evident that there are noteworthy disparities in the levels of satisfaction regarding aspects of online teaching. These differences in satisfaction may stem from varying levels of familiarity that students have with

online learning methods, as well as the unique characteristics and academic demands associated with their fields of study.

Additional analyses was conducted to investigate whether there are differences in the levels of satisfaction with online teaching and teaching in the classroom among different groups of students.

One-way ANOVA was conducted to determine if there were statistically significant differences in the level of student satisfaction with online and teaching in the classroom between students who had subjects organized entirely online, partially online, or not online at all. Since Levene's test for equality of variances was 3.556, $p=0.03 < 0.05$ for satisfaction with online teaching and 3.989, $p=0.02 < 0.05$ for satisfaction with teaching in the classroom, which proved that the assumptions of equal variances were violated, so the results of Welch and Brown-Forsythe tests were used because they are robust tests. These results of Welch test (for satisfaction with online teaching: $F(2; 152.242) = 0.208$, $p=0.813$; for satisfaction with teaching in the classroom: $F(2; 150.873) = 0.313$, $p=0.732$) and Brown-Forsythe test (for satisfaction with online teaching: $F(2; 234.556) = 0.223$, $p=0.800$; for satisfaction with teaching in the classroom: $F(2; 225.938) = 0.354$, $p=0.702$) showed that there were no statistically significant differences in the levels of students' satisfaction with online and teaching in the classroom among students of these three groups. These findings lead to the rejection of our H2 hypothesis.

Additionally, a one-way ANOVA was conducted to determine if there were statistically significant differences in students' satisfaction levels with online compared to teaching in the classroom across different years of studies. Levene's test for equality of variances was 1.296, $p=0.276 > 0.05$ for satisfaction with online teaching and 1.19, $p=0.314 > 0.05$ for satisfaction with teaching in the classroom, which proved that the assumptions of equal variances were not violated. The results indicate that there were no statistically significant differences in the levels of satisfaction with teaching in the classroom ($F(3, 255) = 0.536$, $p=0.658$) and online teaching ($F(3, 255) = 1.801$, $p=0.148$) among the four groups of students. These findings lead to the rejection of our H3 hypothesis.

Wilkins & Balakrishnan (cited in [2]) revealed that there are significant differences in the levels of satisfaction at undergraduate and postgraduate levels. As this study exclusively examined undergraduate studies, upcoming research should broaden its focus to include postgraduate studies as well.

6. CONCLUSION

In today's competitive higher education environment, student satisfaction is crucial, driving universities to adopt more student-centric approaches. Factors like interaction quality, content structure, and flexibility were key to students' satisfaction with online teaching [9], but they were significant even in traditional and blended teaching.

According to the findings in this study, key factors for student's satisfaction include access to literature in both digital and paper formats, technical support, independence in learning, interaction with teachers and colleagues, availability of professors and assistants, clear assessment criteria, feedback on assignments, and the application of knowledge to real-world problems. While traditional teaching appears to hold a slight advantage in perceived support and organization, both modes are generally perceived similarly in terms of personal accomplishment and teacher skills. This suggests that both online and traditional teaching methods are effective, with minor variations in specific aspects of teaching quality. The study's findings indicate that there is no statistically significant difference in the levels of satisfaction with online teaching and classroom teaching between students who had some courses online and those who did not, nor between students at different years of study.

This study has several limitations. Firstly, the participants were only students from technical faculties, excluding students from other higher education institutions, which may limit the generalizability of the findings. Secondly, the focus was only on the perspective of students as service users, without considering the viewpoints of the teaching staff, potentially leading to an incomplete picture of the situation. Thirdly, the study was based on only four variables, which may restrict the depth of the analysis of student satisfaction. To provide a more holistic view, satisfaction with blended learning should also be include.

Future research should aim to overcome these limitations by including students from diverse institutions, incorporating perspectives from both students and teaching staff, and expanding the range of variables studied to include aspects of blended learning.

ACKNOWLEDGEMENTS

This study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, and these results are parts of the Grant No. 451-03-66/ 2024-03/200132 with University of Kragujevac – Faculty of Technical Sciences Čačak.

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