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Students Satisfaction with Online Higher Education during the COVID-19 Pandemic

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Abstract: The digital educational environment is not new in the modern world, but in the context of the COVID-19 pandemic, the transition to online learning has become necessary and fast. This offered the possibility to study various characteristics of objects and subjects in the digital educational environment. During the pandemic, universities worldwide were forced to switch to online learning, creating a global educational experiment with results to be comprehended and theoretically reflected upon. The significance of this scientific reflection is important for understanding the characteristics and factors that influence student satisfaction with online learning, as well as for anticipating possible ways to improve its effectiveness. This research aimed to study the characteristics of satisfaction with online learning during the COVID-19 pandemic in connection with the elements of the Community of Inquiry (CoI) online learning model. The study involved 808 students (M = 22.5, SD = 2.4 (53.3% men)) from 6 countries (Serbia—30.8%, Bosnia and Herzegovina—8.5%, Croatia—8.9%, Romania—21.8%, Russia—25.2%, Slovenija—4.7%). A total of 808 students responded to a questionnaire measuring the levels of cognitive, social, and teaching presence in distance learning. Satisfaction with online learning has been shown to positively correlate with cognitive, social and teaching presence, and overall CoI presence. The results of the Kruskal-Wallis test showed that satisfaction with online learning does not differ among students with different levels of academic performance; however, the subjective assessment of the element of social presence "Tools and platforms for online learning allow students to work with each other" is significantly higher among students with low academic performance. Satisfaction with online learning and the elements of the CoI model is different in study groups with varying degrees of online learning presence, as well as different in students whose training included different elements of online learning. The conclusions obtained in this study will make it possible to organize the digital educational environment more effectively by managing the elements of the CoI model.

Keywords: digital educational environment; satisfaction with learning using digital technologies; Community of Inquiry (CoI) online learning model

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1. Introduction

The digitalization of education is now one of the world's leading trends. The distance form of education opens up several advantages, such as education "without borders". During the COVID-19 pandemic, the processes of digitalization of education were accelerated, leading to a kind of global experiment in online education [1], and therefore the difficulties of organizing distance learning became obvious. Such factors include the lack of a comfortable place to study at home, insufficient training of teachers for online learning, the inability to teach many practical skills online, the lack of the necessary amount of time to prepare classes using digital devices, official guidelines, online textbooks, the problem of assessing the quality of knowledge and skills acquired, the formation of competencies, the problem of motivation, negative consequences of intensive online education for health, and

a decrease in the social activity of students [2–5]. Similar difficulties in distance learning during the COVID-19 pandemic were indicated by Faize and Nawaz [6].

The socio-psychological factors determining the well-being of students during the COVID-19 pandemic include skills for distance learning, satisfaction with the results of this form of learning, maintaining relationships with classmates, and the effectiveness of remote interaction with teachers [7].

The problem of satisfaction with the online learning process is now relevant and is being actively considered by researchers [3,4,8–12]. Satisfaction with distance learning is understood as an integrated concept reflecting the degree of realization of a student's social expectations from educational activities at the university, formed in the process of their socialization [13]; the subjective, emotionally colored assessment of the quality of certain objects and the conditions of educational activity, including interpersonal relationships [14]; emotional and personal attitude, which consist of motivation and subjective experiences associated with the process and result of achieving the goal [15].

Sokolovskaya I.E. points out that satisfaction with online learning is an important factor in increasing the motivation and efficiency of students. For example, scientists name the negative consequences of a decrease in satisfaction with online learning as apathy and depression, deterioration of discipline, absenteeism, deviant behavior associated with aggression and hopelessness, and fear of getting sick from COVID-19 [7].

Satisfaction with learning, therefore, is a subjective assessment of the organization of learning. As discussed above, the authors emphasize that satisfaction with online learning always includes interpersonal and social relationships. In this regard, we consider it appropriate to investigate satisfaction with online learning in connection with the Community of Inquiry (CoI) online learning model. According to this model developed by Garrison, Anderson & Archer [16], online learning is implemented using three types of presence: social, educational, and cognitive presence. The CoI model includes three elements: teaching, cognitive, and social presence, and their interweaving and interaction provide the structure necessary for a dynamic and deep, meaningful online environment for learning and experience acquisition. The rationale for choosing this model was described in more detail by us earlier [17].

Studies show there are mixed results describing the significance of individual elements of the COI model in shaping satisfaction with online learning: some researchers point out the role of the presence of teachers in the formation of satisfaction [1,18–21], others emphasize the importance of cognitive presence [19,22], and social presence is also mentioned [23–28]. At the same time, most authors conducted research in the conditions of a single country with its inherent characteristics of the educational process. At the same time, there is an insufficient number of works presenting the results of studying this problem, conducted in several countries according to one research design, to understand the significance of CoI elements in shaping student satisfaction with online learning.

Thus, the main problem of our research can be formulated in the form of several questions. Is satisfaction with online learning during the COVID-19 pandemic related to cognitive, social and teaching presence? Does the satisfaction with online learning during the COVID-19 pandemic, cognitive, social and teaching presence differ among students with different levels of academic achievement? How exactly does the satisfaction with online learning during the COVID-19 pandemic, cognitive, social and teaching presence in study groups with varying degrees of online learning presence differ? Is there different satisfaction with online learning during the COVID-19 pandemic, cognitive, social and teaching presence among students in whose training various elements of online learning were presented?

2. Literature Review

Community of Inquiry (CoI) is a widely recognized model for online instruction, which was developed by Garrison, Anderson, and Archer [16]. It explains how learning can be successful in an online environment. Online instruction, according to the CoI

model, aims to build an inquiry-based learning community that facilitates learning through interactive and meaningful inquiry and knowledge sharing. The model includes three types of presence: teaching, social, and cognitive presence.

The teaching presence is the interaction between instructors and learners. It can be explained as the organization, design, and guidance of the social and cognitive processes in online education to realize learning outcomes [16]. It includes the organization and design of the online instructional process and direct instruction that enables students to engage in learning and interact with learning materials. Social presence is a student–student interaction. It recognizes the importance of the collective, social, and emotional aspects of learning activities. It represents the process by which students assert themselves socially and emotionally in a virtual learning environment through affective expression, open communication, and group cohesion [29]. Cognitive presence is an interaction between students and learning content, and it involves learning through active inquiry, exploration, critical thinking, analysis, knowledge integration and application, and problem-solving [16]. These three types of presence are interrelated: teaching presence enables the other two, social presence provides the learning environment, while cognitive presence is their outcome.

There is a growing body of literature claiming that CoI elements affect student satisfaction and achievement, although not all research confirms this. For example, Fuchs and Karrila examined student satisfaction and factors influencing it in higher education distance learning in Thailand during the COVID-19 pandemic. Students described online instruction as less complete compared to face-to-face instruction. Students cited the lack of social interaction with peers and the inability to receive academic support as the main reasons [23]. The lack of social interaction and academic support is a common complaint in numerous online learning studies both before and after the COVID-19 pandemic (see also the study by Dospinescu et al. [24]). Another study conducted in 2015 in the United States with graduate students taking online courses in educational leadership showed that their learning and satisfaction were determined by teaching presence (the organization and structure of the teaching process) and cognitive presence (student engagement) but not social presence [19]. Similarly, in examining the effects of interactions on student satisfaction, Kuo et al. showed that all three types of interactions correlated with student satisfaction, but student–student interaction (social presence) had the least impact [22]. However, other studies reported a positive correlation between student satisfaction and social presence [25,26,28]. Salam and Farooq found that the extent to which a learning information system is designed to promote social interaction and collaboration had a direct impact on student satisfaction [27]. Most studies [1,18,20,21] show that teaching presence has a significant impact on student learning and satisfaction, although Xue et al. [28] demonstrated that it is insignificant for student satisfaction. As for cognitive presence, there is no consistent evidence that it has a positive impact on student satisfaction [20,26,28,30,31], and it may have a negative impact [28].

Evidence shows that students' satisfaction with learning indicates their learning performance [32–34]. In examining the relationship between CoI elements and academic performance, Guo et al. found that online collaborative projects and small group sessions contributed to better perceptions of learning effectiveness and that using humor and vocatives in online discussions promoted academic performance [35].

Research findings suggest that students' satisfaction with online learning depends not only on the quality of instruction and CoI elements but also on the perceived characteristics, advantages, and disadvantages of online learning, as well as on the student's personal characteristics. Dai et al. [36] investigated Chinese students' internal and external motivations for learning in a Massive Open Online Course. They found a relationship between students' satisfaction and their positive attitudes toward online learning environments. In addition, research on students' personal characteristics and their satisfaction with online learning has shown that student satisfaction is related to their intention to use online learning environments [27]. Belousova et al. [2] studied the advantages and disadvantages of distance learning. They indicated that older students were more focused on independent

time management, the possibility of combining studies with work and personal affairs, and the economic benefits of distance education as important factors, while schoolchildren were concerned about the accessibility of visuals related to course content.

Several studies have also shown that high satisfaction can lead to higher learning achievement [37,38] and academic success [39].

Research has shown that organizing successful online education requires redesigning the educational process, " ... it requires a different design than a traditional instruction, which often cannot be projected into an online environment" [40]. For example, a systematic review of assessments in higher education during the COVID-19 pandemic showed that one of the biggest challenges was the problem of organizing assessments and preventing dishonest student behavior [41]. The authors discuss that the root of this problem is the transfer of teaching methods from face-to-face classes to the online environment, using the same assessment materials and focusing on the same requirements as in a face-to-face exam content memorization [41]. In this sense, poor design of online instruction can lead to low student satisfaction.

3. Materials and Methods

3.1. Participants and Procedure

The study involved 808 students (M = 22.5, SD = 2.4 (53.3% men)) from 6 countries (Serbia—30.8%, Bosnia and Herzegovina—8.5%, Croatia—8.9%, Romania—21.8%, Russia—25.2%, Slovenija—4.7%). The study was conducted from June to October 2021. Google Forms were used. Online learning was used at all participating faculties during the observation period, and almost 80% was implemented in full or to a greater extent than in real-time. The sample is represented by the fields of education: Social science & Humanities—54.2%, Engineering & Technology—26%, Natural sciences & Mathematics—4.3%, Health Science—8.8%, Creative Arts—0.9%, Interdisciplinary Fields—2.1%.

A remote survey was used; students were offered a link to a Google form with a modified version of the Community of Inquiry questionnaire. Students took part in the study voluntarily and anonymously. The researchers obtained verbal consent from the respondents to participate in the study.

3.2. Measures

The author's questionnaire was used, measuring social characteristics (gender, age, country, focus of study, academic performance (average score)) and criteria for the use of digital tools in the learning process (the degree of representation of online learning; digital tools that were used in online learning; satisfaction with online learning; advantages and disadvantages of online learning). The questionnaire has a simple alternative answer or Likert-type scale rating.

Informed voluntary consent was obtained from each participant in the study.

The modified version of the Community of Inquiry questionnaire [42] was also used, measuring three main constructs: cognitive, social, and teaching presence in online teaching. The evaluation of the questions in this questionnaire was also done according to the Likert-type scale. Since its creation, testing, and validation in 2008, the original instrument has undergone numerous tests on various samples by numerous authors from various parts of the world and repeatedly demonstrated satisfactory reliability and validity [18,28,31,35,43–46]. The original questionnaire was based on the theoretical model of the Community of Inquiry by Garrison, Anderson, and Archer [16]. As part of this research, a further step was taken on its improvement, and the instrument was shortened from the original 34 questions to 18 to increase its efficiency without compromising its reliability or structure. In the author's previous paper, the testing of this modified instrument was carried out. The principal component analysis determined that three distinguished components fully replicate the factor structure of the original CoI instrument and of the theoretical CoI model, thus proving its high validity [40]. Those three components are social, teaching, and cognitive presence. The questionnaire used in this study has a very high reliability (Cronbach's

alpha coefficient is 0.94), and the highest reliability ($\alpha = 0.91$) is of the construct cognitive presence, then of the teaching presence (0.90), and finally of the social presence ($\alpha = 0.85$) (Ibid). It includes questions listed in Tables 2 and 3.

Since the scales of academic performance assessments vary in different countries, the average score was converted to a percentage. Further, according to the law of normal distribution, the sample was divided into groups: group 1—more than 75—a high level of academic achievement; group 2—75–35—an average level of academic achievement; group 3—below 35—a low level of academic achievement. We find it difficult to interpret the average level of academic performance. The average level of academic performance is students who seek to improve their academic grades or have learning difficulties, which causes a decrease in the score. Therefore, only groups with high and low academic performance were included in the statistical analysis.

Statistical procedures were used: descriptive statistics, Spearman's rank correlation coefficient, the Mann-Whitney U test, and the Kruskal–Wallis H test.

The purpose of this research was to study the characteristics of satisfaction with online learning during the COVID-19 pandemic in connection with the elements of the Community of Inquiry (CoI) online learning model.

Based on the analysis of the literature, the following assumptions were put forward, which became the basis of the formed hypotheses: (1) satisfaction with online learning during the COVID-19 pandemic may be associated with cognitive presence, social presence, teaching presence, and the overall level of CoI presence; (2) satisfaction with online learning during the COVID-19 pandemic, cognitive, social and teaching presence and the overall level of CoI presence may have differences in students with different levels of academic performance; (3) satisfaction with online learning during the COVID-19 pandemic, cognitive, social and teaching presence and the overall level of CoI presence may have differences in study groups with different degrees of online learning presence; (4) satisfaction with online learning during the COVID-19 pandemic, cognitive presence, social and teaching presence, and the overall level of CoI presence may differ among students whose studying has featured various elements of online learning.

4. Results

Our article [17] showed that for students in a pandemic, the teaching presence was the most referential, followed by social presence, and the last place was occupied by cognitive presence. In this regard, the research question concerning the influence of the elements of the CoI model on satisfaction with training bears importance.

Hypothesis 1 was tested using Spearman's rank correlation coefficient. It was found that the subjective assessment of satisfaction with online learning is positively associated with cognitive presence, social presence, teaching presence, and the overall level of CoI (Table 1).

Table 1. The relationship between the subjective assessment of satisfaction with online learning and cognitive, social, and teaching presence and the overall CoI presence (Spearman's rank correlation coefficient).

	Teaching Presence	Social Presence	Cognitive Presence	Total CoI
Subjective assessment of satisfaction with online learning	R = 0.563, $p = 0.000$	R = 0.520, $p = 0.000$	R = 0.688, $p = 0.000$	R = 0.657, $p = 0.000$

Further, Hypothesis 2 was tested using Mann-Whitney U test. It was found that the subjective assessment of online learning and elements of the Community of Inquiry (CoI) had no differences for students with different levels of academic performance (see Table 2).

Table 2. Subjective assessment of online learning and elements of the Community of Inquiry (CoI) online learning model for students with different levels of academic performance (Mann-Whitney U test).

	Group 1—Students with High Level of Academic Achievement	Group 2—Students with Low Level of Academic Achievement	Mann-Whitney U	*p*
	M (SD)	M (SD)		
Satisfaction with online learning.	3.3 (1.2)	3.4 (1.4)	11,691.5	0.758
Teachers clearly indicate the learning objectives in online teaching.	3.8 (1.1)	3.8 (1.2)	11,675.5	0.744
Teachers clearly point out important deadlines and students' responsibilities.	1.1 (1.02)	3.9 (1.2)	10,608.5	0.190
Teachers encourage and lead students' discussions in online classes.	3.7 (1.2)	3.8 (1.1)	11,343	0.537
Teachers direct students to learn by doing assignments.	3.8 (1.1)	3.8 (1.2)	11,527	0.647
Teachers encourage students to research.	3.7 (1.2)	4 (1.02)	10,312	0.127
Teachers send students feedback on their progress in learning.	3.4 (1.3)	3.8 (1.3)	10,245	0.117
Teaching presence average.	3.7 (0.9)	3.8 (1)	11,148	0.455
Tools and platforms for online learning enable students to work with each other.	3.6 (1.3)	4.2 (1)	9184	0.012
Students work in pairs or groups on online assignments.	3.4 (1.4)	3.8 (1.5)	10,050.5	0.082
Expressing the opposite opinion from others in online discussions is acceptable.	4 (1.04)	4.1 (0.9)	11,232	0.468
Joint activities with other students help me to test and improve my knowledge.	3.8 (1.2)	4.1 (1.02)	10,476	0.165
Online collaboration with other students provides a sense of belonging to the group.	3.5 (1.3)	3.9 (1.2)	9761	0.046
Interaction with other students regarding the learning content provides new insights and ideas.	3.8 (1.1)	4.1 (1.1)	10,421.5	0.150
Social presence average.	3.7 (0.9)	4 (0.8)	10,260	0.128
Topics and contents of online classes stimulate my interest and creativity.	3.3 (1.2)	3.5 (1.2)	10,921	0.326
Online teaching tools provide access to the necessary information and knowledge.	3.8 (1.03)	3.8 (1.1)	11,646.5	0.724
Participating in online discussions helps me appreciate different points of view.	3.5 (1.2)	3.9 (1.1)	9866	0.056
By combining old and new information, I clarify the issues raised in the classroom.	3.7 (1.1)	4 (1.03)	10,475.5	0.165
Engaging in online teaching helps me to resolve doubts about the material.	3.5 (1.2)	3.7 (1.1)	10,515	0.179
The techniques and methods of work in online classes suit my learning style.	3.3 (1.4)	3.5 (1.4)	10,560	0.197
Cognitive presence average.	3.5 (0.98)	3.8 (0.8)	10,647	0.234
CoI presence in total	3.7 (0.8)	3.9 (0.8)	10,566.5	0.209

The analysis included groups with high and low academic performance. It was found that satisfaction with online learning and certain elements of the Community of Inquiry (CoI) online learning model had no differences. However, particular differences were discovered, significantly, the estimates of the categories of social presence "Tools and platforms for online learning allow students to work with each other". This element is rated higher by students with a low level of academic performance.

There is also a tendency to manifest differences in the assessment of the category of social presence "Online cooperation with other students gives a sense of belonging to a group". This element is rated higher by students with a low level of academic performance.

Further, Hypothesis 3 was tested using Kruskal-Wallis H test. It was found that the subjective assessment of online learning and elements of the Community of Inquiry (CoI) differ in study groups with varying degrees of online learning presence (see Table 3).

Table 3. Subjective assessment of online learning and elements of the Community of Inquiry (CoI) online learning model in study groups with varying degrees of online learning presence (Kruskal-Wallis H test).

	Group 1	Group 2	Group 3	Group 4	Kruskal–Wallis H	*p*
	M (SD)	M (SD)	M (SD)	M (SD)		
Satisfaction of online education.	3.2 (1.2)	3.2 (1.3)	3.8 (1.2)	3.3 (1.3)	17.692	0.001
Teachers clearly indicate the learning objectives in online teaching.	3.7 (1.1)	3.7 (1.1)	4.1 (1)	3.8 (1.1)	13.032	0.005
Teachers clearly point out important deadlines and students' responsibilities.	4.1 (1.1)	4 (1.1)	4.3 (1)	4.1 (1)	3.165	0.367
Teachers encourage and lead students' discussions in online classes.	3.6 (1.2)	3.5 (1.2)	4 (1.1)	3.9 (1.1)	17.818	0.000
Teachers direct students to learn by doing assignments.	3.7 (1.1)	3.7 (1.1)	3.9 (1.1)	3.8 (1)	1.772	0.621
Teachers encourage students to research.	3.6 (1.3)	3.4 (1.3)	3.8 (1.2)	3.9 (1.1)	7.565	0.056
Teachers send students feedback on their progress in learning.	3.3 (1.3)	3.1 (1.4)	3.6 (1.3)	3.5 (1.3)	9.513	0.023
Teaching presence average.	3.7 (1)	3.6 (1)	3.9 (0.9)	3.8 (0.9)	12.129	0.007
Tools and platforms for online learning enable students to work with each other.	3.7 (1.2)	3.4 (1.3)	3.8 (1.3)	3.8 (1.2)	11.04	0.012
Students work in pairs or groups on online assignments.	3.4 (1.4)	3.1 (1.5)	3.6 (1.3)	3.5 (1.4)	9.924	0.019
Expressing the opposite opinion from others in online discussions is acceptable.	3.9 (1.1)	3.9 (1.1)	4.1 (1.1)	3.8 (1.1)	4.753	0.191
Joint activities with other students help me to test and improve my knowledge.	3.7 (1.2)	3.6 (1.3)	3.9 (1.1)	4 (0.8)	5.224	0.156
Online collaboration with other students provides a sense of belonging to the group.	3.5 (1.3)	3.3 (1.4)	3.7 (1.3)	3.6 (1.3)	6.624	0.085
Interaction with other students regarding the learning content provides new insights and ideas.	3.8 (1.1)	3.7 (1.3)	3.9 (1.1)	3.8 (1.1)	2.776	0.427
Social presence average.	3. (0.9)	3.5 (1)	3.9 (0.9)	3.7 (0.9)	13.946	0.003
Topics and contents of online classes stimulate my interest and creativity.	3.2 (1.3)	3.1 (1.3)	3.8 (1.1)	3.4 (1.1)	22.676	0.000
Online teaching tools provide access to the necessary information and knowledge.	3.7 (1.1)	3.7 (1.1)	4 (1)	3.9 (0.9)	11.329	0.010
Participating in online discussions helps me appreciate different points of view.	3.5 (1.1)	3.3 (1.2)	3.9 (1.2)	3.8 (1)	22.538	0.000
By combining old and new information, I clarify the issues raised in the classroom.	3.6 (1.1)	3.6 (1.2)	3.9 (1)	3.9 (0.9)	9.151	0.027
Engaging in online teaching helps me to resolve doubts about the material.	3.4 (1.2)	3.4 (1.3)	3.8 (1.1)	3.6 (1)	12.374	0.006
The techniques and methods of work in online classes suit my learning style.	3.1 (1.4)	3.1 (1.4)	3.7 (1.3)	3.4 (1.3)	15.767	0.001
Cognitive presence average.	3.4 (1)	3.4 (1)	3.8 (0.9)	3.7 (0.8)	20.609	0.000
CoI presence in total	3.6 (0.9)	3.5 (0.9)	3.9 (0.8)	3.7 (0.8)	18.416	0.000

Notes: Group 1—Online training only, Group 2—Online training is presented to a greater extent than classroom classes, Group 3—Online training and classroom classes are presented equally, Group 4—Online training is presented to a lesser extent than classroom classes.

Subjective assessment of satisfaction with online learning significantly differs in study groups with varying degrees of online learning presence.

The differences between teaching presence and some of its categories have been established, namely, "Teachers clearly indicate the goals of teaching in online learning" and "Teachers encourage and lead discussions of students in online classes". The tendency to show differences is observed when evaluating the category "Teachers send students feedback on their learning progress".

The differences between social presence and its category "Tools and platforms for online learning allow students to work with each other" are revealed. The tendency to show differences is observed when evaluating the category "Students work in pairs or groups on online assignments".

There are significantly different assessments of cognitive presence and its categories, namely "Topics and content of online classes stimulate my interest and creativity", "Online learning tools provide access to the necessary information and knowledge", "Participation in online discussions helps me appreciate different points of view", "Participation in online learning helps me resolve doubts about the material", and "Techniques and methods of working in online classes correspond to my learning style". The tendency to show differences is observed when evaluating the category "By combining old and new information, I clarify the issues raised in the class".

The overall level of CoI presence was significantly different.

All of the above differences were evaluated by students with online training and classroom classes equally represented, as well as those with online training less represented than classes in vivo.

Further, Hypothesis 4 was tested using Kruskal-Wallis H test. It was found that the subjective assessment of online learning and elements of the Community of Inquiry (CoI) are different among students in whose training different elements of online learning were presented among students who indicated various tools used in online learning (see Table 4).

More common elements of online learning used by teachers in online learning during the COVID-19 pandemic are texts and presentations, correspondence between teachers and students (email, social networks), video or audio recording of lectures, video communication between teachers and students (Skype, Zoom, Google Meet, etc.).

In a group of students where texts and presentations were used in online training, there were no differences in the subjective assessment of student satisfaction, teaching, social, and cognitive presence.

When using such learning elements as Correspondence between teachers and students (email, social networks), Additional audio and video materials (in addition to lectures), Forums and other forms of student discussions conducted by teachers, Joint online projects for students, Textbooks and textbooks in digital form, Automated testing tools, Software applications for various purposes, significant differences or trends in the manifestation of differences in the subjective assessment of satisfaction with learning, teaching, social, and cognitive presence were identified.

Differences in only the subjective assessment of satisfaction with learning were observed when using video or audio recordings of lectures.

The use of video communication between teachers and students (Skype, Zoom, Google Meet, etc.) showed differences in teaching, social, and cognitive presence.

Thus, the formulated assumptions were partially or completely confirmed. This allows one to describe the content of the results obtained (see also Supplementary Materials).

Table 4. Subjective assessment of online learning and elements of the Community of Inquiry (CoI) online learning model for students in whose training various elements of online learning were presented (Kruskal–Wallis H test).

Online Learning Element		Sat.	TP	SP	CP	CoI
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Texts and presentations	Yes (90.2%)	3.3 (1.2)	3.7 (0.9)	3.7 (0.9)	3.5 (1)	3.6 (0.8)
	No (9.8%)	3.2 (1.3)	3.5 (1.1)	3.5 (1.1)	3.4 (1.1)	3.5 (1)
	Kruskal–Wallis H	27,524.5	26,227.5	25,572.5	26,818	25,497.5
	p	0.507	0.191	0.101	0.315	0.094
Correspondence between teachers and students (email, social networks)	Yes (70.4%)	3.4 (1.2)	3.8 (0.9)	3.8 (0.9)	3.6 (1)	3.7 (0.8)
	No (29.6%)	3.1 (1.3)	3.4 (1)	3.2 (1)	3.3 (0.9)	3.3 (0.9)
	Kruskal–Wallis H	58,004.5	50,504.5	55,489	53,480	51,168.5
	p	0.001	0.000	0.000	0.000	0.000
Video or audio recording of lectures	Yes (64.1%)	3.2 (1.2)	3.7 (1)	3.7 (1)	3.5 (1)	3.6 (0.9)
	No (35.9%)	3.5 (1.2)	3.7 (0.9)	3.7 (0.9)	3.5 (1)	3.6 (0.9)
	Kruskal–Wallis H	66,947	72,856.5	74,727	71,964.5	72,945
	p	0.008	0.478	0.904	0.322	0.496
Video communication between teachers and students (Skype, Zoom, Google Meet, etc.)	Yes (83.4%)	3.4 (1.2)	3.8 (0.9)	3.7 (0.9)	3.5 (1)	3.7 (0.8)
	No (16.6%)	3.1 (1.4)	3.4 (1.1)	3.5 (1)	3.3 (1)	3.4 (0.9)
	Kruskal–Wallis H	41,261.5	36,690	38,975	38,670.5	37,220
	p	0.105	0.001	0.012	0.008	0.001
Additional audio and video materials (in addition to lectures)	Yes (35.8%)	3.4 (1.2)	4 (0.9)	3.8 (0.9)	3.6 (1)	3.8 (0.8)
	No (64.2%)	3.2 (1.3)	3.6 (1)	3.6 (0.9)	3.4 (1)	3.5 (0.9)
	Kruskal–Wallis H	68,926.5	57,578	63,502	63,931.5	59,679.5
	p	0.050	0.000	0.000	0.000	0.000
Forums and other forms of student discussions conducted by teachers	Yes (19.1%)	3.5 (1.2)	4.1 (0.9)	4 (0.8)	3.8 (0.9)	3.9 (0.8)
	No (80.9%)	3.3 (1.3)	3.6 (1)	3.6 (0.9)	3.4 (1)	3.5 (0.8)
	Kruskal–Wallis H	45,164.5	36,447.5	38,281.5	40,269	36,934
	p	0.041	0.000	0.000	0.000	0.000
Joint online projects for students	Yes (27.2%)	3.5 (1.2)	4 (0.9)	4 (0.8)	3.7 (0.9)	3.9 (0.8)
	No (72.8%)	3.3 (1.3)	3.6 (1)	3.6 (1)	3.4 (1)	3.5 (0.9)
	Kruskal–Wallis H	58,998	51,849	49,407	55,220	50,497.5
	p	0.048	0.000	0.000	0.001	0.000
Textbooks and teaching aids in digital form	Yes (48.3%)	3.5 (1.2)	3.9 (0.9)	3.9 (0.9)	3.7 (0.9)	3.8 (0.8)
	No (51.7%)	3.2 (1.3)	3.5 (1)	3.5 (0.9)	3.3 (1.01)	3.4 (0.9)
	Kruskal–Wallis H	69,718.5	65,269	62,189	65,560	62,696.5
	p	0.000	0.000	0.000	0.000	0.000
Automated testing tools	Yes (38.2%)	3.4 (1.2)	3.8 (0.9)	3.8 (0.9)	3.6 (0.9)	3.7 (0.8)
	No (61.8%)	3.2 (1.3)	3.6 (1)	3.6 (1)	3.4 (1)	3.6 (0.9)
	Kruskal–Wallis H	69,185.5	69,971.5	70,028	69,054.5	68,951
	p	0.012	0.027	0.028	0.012	0.012
Software applications for various purposes	Yes (13.7%)	3.5 (1.3)	4.1 (0.9)	4.1 (0.8)	3.7 (0.9)	4 (0.8)
	No (86.3%)	3.3 (1.2)	3.6 (1)	3.6 (0.9)	3.4 (1)	3.6 (0.9)
	Kruskal–Wallis H	34,185	27,037.5	27,077.5	30,479	27,356.5
	p	0.043	0.000	0.000	0.000	0.000

Notes: Sat.—satisfaction with online learning, TP—teaching presence, SP—social presence, CP—cognitive presence, CoI—CoI presence in total.

5. Discussion

A study of the characteristics of satisfaction with online learning in higher education during the COVID-19 pandemic showed that the subjective assessment of satisfaction with online learning correlates with elements of the Community of Inquiry (CoI) online learning model. Thus, the purposeful construction of the online educational environment will contribute to achieving a high level of teaching, social, and cognitive presence and could contribute to student satisfaction with learning.

Groups of students with high and low levels of academic achievement do not differ in their satisfaction assessments with online learning, teaching, social, and cognitive presence.

However, there are particular differences in the assessments of the educational environment itself. The organization of cooperation with other students in online learning and the joint work of students in an online environment is more significant for students with a low level of academic performance. Baum S. notes that students in online education programs have poorer academic performance on average [43]. Other researchers point out that students' academic performance after online learning is equally high or even higher than with traditional learning [44,45]. Some researchers emphasize the importance of changing the assessment system in online learning, believing that a simple transfer of traditional assessment is difficult and sometimes impossible, which affects satisfaction with online learning [40]. Guo et al. showed that students evaluate it as effective if they include joint activities in their training, online projects, and the method of small groups of classes. Improved academic performance is also associated with face-to-face communication, the use of humor and references in online discussions [35]. It is also pointed out that a strong social presence should be created in online learning communities [46,47], in which a sense of belonging and connection develops and strengthens the motivation and involvement of students [45]. Many researchers emphasize a relationship between student satisfaction and social presence [25–28]. We assume that the emphasis on social presence in the organization of online learning will support students with a low level of academic achievement.

A comparison of groups with varying degrees of online learning presence also showed significant differences in the subjective assessment of satisfaction with online learning and elements of the Community of Inquiry (CoI) online learning model. The subjective assessment of satisfaction with online learning was evaluated higher by students who had online training and classroom classes equally represented in the organization of training during the COVID-19 pandemic. The lowest ratings of satisfaction with training were observed when online training was presented in full or to a greater extent than classroom training.

Assessments of teaching, social, and cognitive presence were also different in groups with varying degrees of online learning presence during the COVID-19 pandemic. Elements of the Community of Inquiry (CoI) online learning model students who had only online training or online training and classroom classes in the organization of training during the COVID-19 pandemic were also rated higher.

We could observe what increases the assessment of the level of presence in the organization of online learning during the COVID-19 pandemic: setting learning goals in online learning, organizing discussions in online classes, teacher feedback on the progress of students, working in pairs and groups in online lessons, access to the necessary information, the use of different teaching methods. Swan [47] identified six best practices for teaching presence: setting clear learning goals and instructions for students; using a wide range of course content presentations; developing teaching methods or exercises that allow students to be active and involved; providing students with feedback; flexibility in ways to achieve learning outcomes; and providing students with support and mentoring to the greatest extent possible. However, according to our research, the level of presence increased when combining online and classroom forms of education. Interviews with ADL (Asynchronous Distance learning) students also showed that most students would like to have face-to-face training in addition to ADL, and this leads to the creation of a BL (blended learning) environment [48]. The need for live communication is also indicated by Abakumova et al. [49].

More often, teachers in online education during the COVID-19 pandemic used texts and presentations, correspondence between teachers and students (email, social networks), video or audio recording of lectures, and video communication between teachers and students (Skype, Zoom, Google Meet, etc.).

Subjective assessment of satisfaction with online learning, teaching, social, and cognitive presence was evaluated higher by students in the organization of online learning, which used correspondence between teachers and students (email, social networks), additional audio and video materials (in addition to lectures), forums and other forms of

student discussions conducted by teachers, joint online projects for students, textbooks and manuals in digital form, automated testing tools, and software applications for various purposes.

Curiously, the subjective assessment of satisfaction with online learning was higher among students who did not use video and audio recordings of lectures. At the same time, there were no differences when evaluating the elements of the Community of Inquiry (CoI) online learning model in the presence/absence of video and audio recordings of lectures. However, video communication between teachers and students (Skype, Zoom, Google Meet, etc.) increased the assessment of teaching, social, and cognitive presence in online learning. Carey [50], Cavanaugh et al. [51], Chou [52], Allen & Seaman [53], Kauffman [54], and Wladis et al. [55] noted that the support and encouragement of students in the process of distance learning and the level of interaction between teacher and student can improve the effectiveness of learning.

It should be pointed out that the use of texts and presentations in the organization of online learning does not lead to an increase in the assessment of satisfaction with learning, teaching, social, and cognitive presence.

6. Conclusions

6.1. Theoretical Implications

The study of the characteristics of satisfaction with online education in higher education during the COVID-19 pandemic allows us to draw the following conclusions:

1. Satisfaction with online learning positively correlates with cognitive, social and teaching presence, and the overall level of CoI presence;
2. Satisfaction with online learning does not differ among students with different levels of academic performance; however, the subjective assessment of the element of social presence, "Tools and platforms for online learning allow students to work with each other", is significantly higher among students with low academic performance;
3. Satisfaction with online learning and elements of the CoI model differs in study groups with varying degrees of online learning presence. The subjective assessment of satisfaction with online learning, teaching, social, and cognitive presence is assessed higher by students who had online training and classroom classes equally represented in the organization of training during the COVID-19 pandemic;
4. Satisfaction with online learning and the elements of the CoI model is different among students in whose training different elements of online learning were presented.

6.2. Practical Implications

To increase satisfaction with online learning, it is necessary to expand the repertoire of educational technologies and tools that enable teaching presence. As the literature review and the conducted research showed, students appreciate direct online communication with the teacher, expressed in direct guidance and instructions, correspondence, feedback, assessments, monitoring, and including even comments, humor, and other forms of active and immediate interaction. This relates to higher student satisfaction when online teaching is equally presented as face-to-face communication. It is therefore important to develop and implement more strategies, techniques, and tools for introducing immediate communication, joint activities, and direct interaction, especially for students with a lower level of academic performance.

Teachers should enhance students' cognitive presence and involve different levels of student cognitive activity. The focus should be on increasing the levels of creative thinking, problem solving, and knowledge application. Teachers should engage students in online projects in teams, small groups, and pairs, assign tasks in which students need to apply theoretical knowledge in solving practical and professional problems, and constantly stimulate student curiosity and creativity. These can be projects, case studies, discussions, forums, debates, and other forms of online communication that create conditions for active interaction. As this research proved, the teacher should use various elements in teaching to

stimulate student motivation and interaction, depending on the content, specific learning goals, and characteristics of the study groups.

6.3. Limitations

Even though this research was designed to overcome most research limitations, being international, involving different levels of online teaching, and including all educational fields, some aspects could contribute to a limited understanding of the phenomenon of online learning. First, a limitation of this study is the participation of students from different regions of Europe, who were mainly from the Balkan countries and Eastern Europe. At the same time, the countries of Western and Northern Europe also need a broad study of this problem, which is a subject field for future research. The second limitation is the focus on higher education, although schooling is even more in need of such research. The third limitation is related to the lack of understanding of the role of assessments and motivation, emotional characteristics that contribute to developing student satisfaction with online learning.

Prospects for the development of this problem are the study of personal and motivational factors that affect the assessment of satisfaction with online learning and the overall level of presence. We also consider it interesting to compare satisfaction with online learning of students and teachers using various educational technologies.

The survey results will help analyze the effectiveness of educational technologies for the development of cognitive, social presence, and the teaching presence.

The main questions can be formulated as follows: to what extent do existing educational technologies help students and increase satisfaction with online learning? What role do educational technologies play in the effectiveness of the educational process involving the use of social networks in online learning? How does the group dynamic of students develop in online learning, and how does this relate to social presence?

The next task for future research could be to explore teacher perceptions and assessments of the Community of Inquiry (CoI) online learning model. This research direction also involves the study of motivational, personal, and cognitive predictors that affect the satisfaction of teachers with online learning.

These studies can be used by methodological services of higher educational institutions to make recommendations for the organization of the educational process in a distance form.

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