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An examination of the effectiveness of online education in terms of student satisfaction anfaculty members' views

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Abstract

The aim of this study is to examine the effectiveness of online (distance) education in higher education through a holistic perspective based on student satisfaction and faculty members' views. A mixed-methods approach was employed, adopting an explanatory sequential design. Quantitative data were collected through the Distance Education Satisfaction Questionnaire administered to university students, while qualitative data were obtained via semi-structured interviews conducted with faculty members. Descriptive statistics, correlation analysis, independent samples t-test, and one-way analysis of variance (ANOVA) were used to analyze the quantitative data, whereas qualitative data were analyzed using descriptive analysis. The findings revealed that students reported a high level of satisfaction with the technical infrastructure and system operation of distance education; however, the pedagogical effectiveness of online education was perceived to be lower compared to face-to-face education. Analyses based on gender indicated that male students demonstrated significantly higher satisfaction levels with distance education than female students. In terms of age, the results showed that adaptability to and satisfaction with online education increased as age increased, with students aged 26 and above perceiving online education as more effective. Satisfaction with technical

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infrastructure did not show a significant difference based on gender or age. Qualitative findings indicated that faculty members' technological, pedagogical, and communication competencies play a decisive role in learning effectiveness and student motivation. Overall, the results suggest that while technical infrastructure is necessary, it is not sufficient on its own; interaction, pedagogical design, and faculty competencies are the key determinants of student satisfaction in distance education.

Keywords: Distance education, online learning, student satisfaction, faculty members' views, digitalization in higher education, mixed methods

1. INTRODUCTION

The aim of higher education institutions is to integrate rapidly developing technology into learning processes, utilize this technology in knowledge production to make students more active in education, offer a diverse educational environment, and provide more functional working opportunities for employees, thus laying the groundwork for various research projects. Within this framework, Türkiye needs to adopt a new strategic orientation in the field of higher education, prioritizing and efficiently utilizing digitalization for all stakeholders. As part of Türkiye's 2023 Education Vision, higher education institutions have implemented digitalization through various projects in line with this orientation (Özek & Sincer, 2024). These projects include activities such as providing digital environments in education, digitizing educational materials, strengthening distance education infrastructure, and creating and making ready-to-use virtual laboratories (Taşkıran, 2017).

One of the biggest reasons accelerating this orientation process is the Covid-19 pandemic experienced worldwide. Higher education institutions have been forced to move away from traditional educational approaches and towards alternative education models. Educators who continued face-to-face education have conducted studies on online classes using distance education methods (Nia et al., 2023). In Turkey, with the increase in restrictions and social distancing rules due to the Covid-19 pandemic, studies on digitalization and the inclusion of technological processes in education have rapidly increased. Educational institutions have integrated distance education methods into their educational models, and universities have started to implement hybrid education and uninterrupted education methods. This challenging process has made digitalization in higher education a permanent and necessary method rather than a preference.

2.0 Theoretical Framework

Studies aimed at understanding the effectiveness of online education are addressed not only through technical infrastructure and access possibilities, but also through multidimensional theoretical models in the context of pedagogical design, social interaction, and learner cognitive engagement. This research is based on the Community of Inquiry (CoI) model, self-regulated learning theory, and the technology acceptance approach, primarily to explain the effectiveness of online education.

2.1 Community of Inquiry (CoI) Model

One of the most widely used theoretical frameworks for explaining the nature of online learning environments, the Community of Inquiry model suggests that learning occurs through the interaction of three fundamental entities:

1. Teaching Presence

2. Social Presence
3. Cognitive Presence

The model was first developed by D. Randy Garrison, Terry Anderson, and Walter Archer.

Teaching Presence

Teaching presence encompasses lesson planning, content organization, interaction management, and feedback processes. The pedagogical competence of the instructor and their ability to manage the online environment are direct determinants of student satisfaction levels. In this study, the instructors':

- Technological competence
- Interactive lesson delivery
- Feedback provision skills

were evaluated within the scope of teaching presence.

Social Presence

Social presence refers to students feeling like they are "part of a real community" in an online environment. When the perception of social presence is low, students may experience the learning process superficially, even if they are in a technically accessible system. In this research, especially:

- Accessibility to the instructor
- Level of interaction
- Gender-based satisfaction differences

were interpreted in the context of social presence.

Cognitive Presence

Cognitive presence refers to the student's level of meaning-making, critical thinking, and knowledge structuring in the learning process. Students' perceptions that "distance education is not as effective as face-to-face education" indicate a weak experience of the cognitive presence dimension (Alshammari, & Alshammari, 2024).

In this context, the perception of pedagogical effectiveness has been considered as an indicator of cognitive presence.

2.2 Self-Regulated Learning

Online learning environments require a higher level of self-regulation skills from students compared to traditional classroom environments. Self-regulated learning refers to an individual's capacity to plan, monitor, and evaluate their own learning process.

In interpreting the findings regarding the age variable, the assumption that self-regulation capacity increases developmentally has been taken as the basis. The higher level of adaptation of older students to online education is associated with their more developed self-regulation skills (Farrokhnia, Taghizade, Ahmadi, Papadopoulos, & Noroozi, 2025).

This situation shows that online education cannot be conducted with a single type of pedagogical design; it requires differentiated strategies according to the learner profile.

2.3 Technology Acceptance Approach

The perceived usefulness and ease of use of the technical infrastructure play a significant role in the adoption of online learning environments. In this regard, the Technology Acceptance Model (TAM) framework offers a fundamental model for explaining the users' technology acceptance process (Jiang, 2025; Barz, 2024). The model operates on two main components:

- Perceived usefulness
- Perceived ease of use In the study, students' high satisfaction levels with the technical infrastructure indicate a strong perception of ease of use.

However, the low perception of pedagogical effectiveness reveals that technology acceptance alone is not sufficient for learning satisfaction. In this context, the study contributes to the literature by highlighting the divergence between technical acceptance and pedagogical satisfaction.

2.4 Relationship of the Theoretical Model to the Research

This research integrates the theoretical approaches described above and addresses the effectiveness of online education through four main dimensions:

1. Technical Infrastructure (TAM – ease of use)
2. Teaching Staff Competencies (Teaching Presence)
3. Interaction and Access (Social Presence)
4. Perception of Productivity and Belief in Success (Cognitive Presence)

In addition, the age variable was associated with self-regulated learning capacity; and the gender variable was interpreted in the context of differences in the perception of social presence.

This holistic approach makes it possible to evaluate the effectiveness of online education not only through technical performance but also together with its pedagogical and psychosocial dimensions.

Student Satisfaction in Distance Education

Student satisfaction is one of the most important parameters determining the quality and success of education in the distance education process. Studies conducted during the pandemic period have shown that student satisfaction levels regarding online learning vary (Simsek et al., 2021). Literature studies indicate that the difference observed in student satisfaction is directly related to the use of technology. It is stated that students who effectively use information technologies are more willing and highly motivated to learn online (Eygü & Karaman, 2013; García, 2024). In this context, readiness and perceived interaction have been identified as factors affecting satisfaction in online learning (Bağriacik Yilmaz, 2023).

The effective provision of technical support along with online infrastructure in learning environments is directly related to student satisfaction. In processes where technical support is insufficient in the online learning system, it cannot be said that the learning experience and student satisfaction are successful (Green et al., 2012).

The Role of Instructors in Distance Education

A large number of higher education institutions offer distance education opportunities to their students. Universities are carrying out various activities to improve the quality of online courses within their own structures. The greatest contribution to the high quality of online courses comes from the instructor (Sun & Chen, 2016). Instructors have moved beyond being traditional sources of information with online courses and have taken on many roles, including technology experts, mentors, and instructional designers. These

roles have also made technical and systemic competencies mandatory (Duman & Horzum, 2016). Although it is thought that the student is at the center of education in the distance education process and that the responsibility largely rests with them, the delivery of the course, the development of materials, the execution of the course, and the role of a bridge between the student and the institution also fall to the instructor (Kaya & Çekerol, 2025). Education has not only been affected by developing technology but has also become a component of technology. Thanks to developments such as artificial intelligence, virtual laboratories, big data, and the Internet of Things, the understanding of education is changing (Haleem et al., 2022). The inclusion of personal learning assistants in education can be cited as a significant example of these differences. The ability of instructors to keep up with developments and exhibit an open attitude towards innovation directly affects the success and efficiency of distance education applications (Martin et al., 2019).

Although the technological components of online education and the transforming roles of instructors occupy a large space in the literature, there is still a need for current studies that evaluate the effectiveness of this process from both student satisfaction and instructor perspectives. The most fundamental elements determining the quality of a course should be evaluated not unilaterally, but with a holistic approach from both the learner and instructor perspectives. In this context, the aim of the present study is to examine the effectiveness of online education from a multidimensional perspective and to provide a basis for strategies that will improve the quality of education and increase student satisfaction.

Research Objective

The main objective of this research is to examine the effectiveness of the online education process in higher education from a holistic perspective, taking into account student satisfaction and faculty opinions. In this study, the effectiveness of online education was addressed within the framework of technical infrastructure, pedagogical effectiveness, level of interaction, and perception of success.

Two different data collection tools were used in the research. Quantitative data were obtained from students through the University Students' Distance Education Satisfaction Survey; qualitative data were collected through semi-structured interviews conducted with faculty members. Accordingly, the students' satisfaction levels regarding online education and the faculty members' evaluations of the process were analyzed together to try to reveal the strengths and areas for improvement of online education. In line with this general objective, the following research questions were addressed:

Research Questions

- What is the general satisfaction level of university students with online education?
- Do students' satisfaction levels with online education differ in terms of technical infrastructure, pedagogical effectiveness, and interaction dimensions?
- Do students' satisfaction levels with online education differ significantly according to gender and age variables?
- Are there significant relationships between the dimensions of satisfaction with the online education process?
- What are the opinions of faculty members regarding the online education process?
- How do faculty members evaluate the problems encountered in online education and their proposed solutions?

3.METHOD

3.1 Research Design

In this research, a mixed methods approach was adopted to examine the effectiveness of the online education process holistically through both quantitative and qualitative data. Mixed methods research designs aim to understand the research problem more comprehensively and deeply by using quantitative and qualitative data collection and analysis processes together. This approach makes it possible to have a multi-dimensional perspective that a single data source cannot provide.

In this study, the Explanatory Sequential Design was preferred from mixed methods designs. In this design, the research process is carried out in two stages. In the first stage, quantitative data are collected and analyzed; in the second stage, qualitative data are obtained to explain, deepen, and interpret the quantitative findings. In this research, the process proceeded as follows:

1. Quantitative Stage: The satisfaction levels of university students with online education were determined through the Distance Education Satisfaction Survey; the data were analyzed using descriptive statistics, correlation analysis, independent samples t-test, and one-way analysis of variance (ANOVA).

2. Qualitative Phase: In order to gain a deeper understanding of the results obtained from the quantitative findings, semi-structured interviews were conducted with the faculty members. The data obtained were analyzed using descriptive analysis methods; themes, sub-themes, and codes were created and related to the quantitative findings. The main reason for choosing this design is to allow the numerical findings regarding student satisfaction levels to be explained through the experiences and evaluations of the faculty members. Thus, the effectiveness of online education was interpreted not only through statistical results but also from the practitioner's perspective.

In conclusion, the explanatory sequential mixed methods design allowed for a holistic evaluation of the technical, pedagogical, and interactional dimensions of the online education process, in accordance with the research objective.

3.2 Study Group

The study group of this research consists of students participating in the online education process at a state/foundation university and faculty members working at the same institution. Since both quantitative and qualitative data were collected within the scope of the research, the study group consists of two subgroups.

Quantitative Study Group

The study group, which is part of the quantitative dimension of the research, consists of a total of N = 2086 university students who actively participate in the online education process. Participants were included in the research on a voluntary basis.

Convenience sampling method was used in the data collection process. When the demographic characteristics of the participants are examined:

- 61.4% (n = 1280) are female,
- 38.6% (n = 806) are male.

The distribution according to age groups is as follows:

- 17–20 years: n = 1339
- 21–25 years: n = 600
- 26 years and over: n = 144

This distribution allowed the research to comparatively examine the perceptions of students in different age groups towards online education.

Qualitative Study Group

The qualitative dimension of the research includes faculty members who actively conduct online courses. Faculty members were selected using criterion sampling, a type of purposeful sampling. The criterion considered was that participants had conducted online courses for at least one semester.

Data obtained through semi-structured interviews aimed to reveal the experiences of faculty members regarding online education, the problems they encountered, and their proposed solutions.

In line with the mixed methods approach, quantitative and qualitative study groups were designed to complement each other; the aim was to support the numerical findings regarding student satisfaction levels with the experiential evaluations of the faculty members.

3.3 Data Collection Tools

In this research, data were obtained using quantitative and qualitative data collection tools. Quantitative data were collected through a survey administered to determine students' satisfaction levels with online education; qualitative data were collected through semi-structured interviews conducted with faculty members.

3.3.1 University Students' Satisfaction with Distance Education Survey

In the quantitative dimension of the research, the "University Students' Satisfaction with Distance Education Survey" developed by Kafes and Yıldırım (2021) was used to measure the satisfaction levels of students with online education. The survey consists of items covering dimensions such as technical infrastructure, system operation, access to instructors, pedagogical effectiveness, and perception of success related to the online education process.

The survey items are arranged on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). High scores obtained from the scale indicate that students have a high level of satisfaction with online education. Within the scope of the research, the internal consistency coefficient (Cronbach's Alpha) of the scale was calculated, and it was determined that the scale is a reliable measurement tool (α = .891). The reliability coefficients for the sub-dimensions are also at an acceptable level (α > .70).

3.3.2 Semi-Structured Faculty Interview Form

In the qualitative dimension of the research, in order to examine the opinions of faculty members regarding the online education process, opinions were obtained from 4 experts in the field (1 computer engineer, 1 distance education center expert, 2 computer teachers), and the questions were finalized and applied. While preparing the interview form, studies in the literature were examined and open-ended questions focusing on the following themes were created in line with the purpose of the research.

The interview form included questions on the following themes:

- Technical and pedagogical problems encountered in the online education process
- Student participation and interaction level
- Faculty members' perceptions of their competence
- Suggestions for improving the process

The interviews were conducted on a voluntary basis, and a total of 19 faculty members participated in the research. The data obtained from the interviews were converted into written text and analyzed.

3.4 Data Analysis

In this research, data were obtained using quantitative and qualitative data collection tools. Quantitative data were collected through a survey administered to determine students' satisfaction levels with online education; qualitative data were collected through semi-structured interviews conducted with faculty members.

3.4.1 Analysis of Quantitative Data

Quantitative data were analyzed using a statistical analysis program. First, the normality assumption of the data set was examined; it was observed that the skewness and kurtosis values were in the ±1 range, and it was accepted that the data conformed to a normal distribution. Parametric tests were applied accordingly. The following analysis techniques were used in line with the research questions:

- Descriptive Statistics: Arithmetic mean (M) and standard deviation (SS) values were calculated to determine the satisfaction levels of students with online education.
- Pearson Correlation Analysis: Pearson product-moment correlation coefficient was calculated to determine the relationships between satisfaction variables related to distance education.
- Independent Samples T-Test: It was applied to determine whether the satisfaction levels of students differed according to the gender variable.
- One-Way Analysis of Variance (One-Way ANOVA): It was used to examine whether the satisfaction levels differed according to age groups. In cases where significant differences were detected, post-hoc analyses were used to determine the source of the difference between the groups.

The significance level was accepted as .05 in all analyses.

3.4.2 Analysis of Qualitative Data

Data obtained from semi-structured interviews were transcribed and analyzed using descriptive analysis methods. In the analysis process, the data were first carefully read, meaningful statements were identified, and codes were created. Similar codes were grouped together to form sub-themes and themes.

The classifications made by the researcher during the coding process were reviewed, and the themes were structured by relating them to the research questions. To increase the reliability of the findings, direct participant statements were included. In line with the mixed methods approach, qualitative findings were interpreted to support and explain the quantitative analysis results. Thus, the effectiveness of the online education process was evaluated in both statistical and experiential dimensions.

4. FINDINGS

4.1 Descriptive Findings Regarding Distance Education Processes

Table 1

Descriptive Statistics of Distance Education Satisfaction Survey

Evaluation Statements	*N*	*M*	*SD*
In the distance learning process, classes start on time.	2086	4.14	1.10
I did not experience any system-related problems with my assignments and projects in the distance learning system.	2086	4.00	1.18
I did not experience any problems during the remote learning process (not related to my own internet or computer).	2086	3.92	1.27
I can contact the instructors/lecturers teaching the courses during the distance learning process whenever I need to.	2086	3.78	1.22
Distance learning was an easy process to get used to.	2086	3.37	1.37
Education at universities should continue, if not entirely, then at least partially, through distance learning.	2086	3.16	1.45
The distance learning process had a positive impact on my academic performance.	2086	3.04	1.43

Evaluation Statements	*N*	*M*	*SD*
I believe that distance learning is just as effective as in-person learning.	2086	2.98	1.48

Note: N: Number of participants, M: Arithmetic Mean, SD: Standard Deviation.

Table 1 shows that students' satisfaction levels regarding the distance education process are generally at the moderate to upper-moderate level. The item with the highest average is "Classes start on time in the distance education process" (M = 4.14, SD = 1.10). This finding indicates that students believe the online education process is conducted in an organized manner in terms of time management. Similarly, students showed a high level of agreement with the statement "I did not experience any system-related problems with my assignments and projects in the distance education system" (M = 4.00, SD = 1.18).

In contrast, the item with the lowest average is "I think the distance education process is as efficient as the face-to-face education process" (M = 2.98, SD = 1.48). This finding reveals that students do not consider online education as efficient as face-to-face education. Similarly, the statement "The distance education process positively affected my success" also has a relatively low average (M = 3.04, SD = 1.43). Students' opinions on whether distance education should continue, at least partially, are at a moderate level (M = 3.16, SD = 1.45). Overall, while students are satisfied with the technical aspects of distance education, they are more cautious in their assessment of its pedagogical effectiveness and academic efficiency.

4.2 Relational Findings Between Distance Education Satisfaction Variables (Correlation Analysis)

Table 2

Correlation Matrix Between Distance Education Perception and Satisfaction Variables

Variables	1	2	3	4	5	6	7	8
1. It was easy to get used to.	1							
2. As productive as face-to-face interaction.	.675**	1						
3. Partial continuation is necessary.	.589**	.681**	1					

Variables	1	2	3	4	5	6	7	8
4. It had a positive impact on success.	.672**	.775**	.733**	1				
5. Classes start on time.	.435**	.386**	.364**	.414**	1			
6. I didn't experience any problems (Technical).	.436**	.366**	.385**	.434**	.527**	1		
7. I can reach the teachers.	.450**	.441**	.390**	.482**	.556**	.547**	1	
8. There are no problems with the assignments.	.452**	.375**	.375**	.423**	.550**	.598**	.615**	1

*Note: ** Significant correlation at p < .01 level.*

Table 2 shows that there are positive and significant relationships between the variables of perception and satisfaction with distance education ($p < .01$).

The highest correlation was found between the variables "Distance education is as efficient as face-to-face education" and "Distance education positively affects success" ($r = .775$, $p < .01$). This finding indicates that students' perception of distance education as efficient is strongly related to their positive evaluations of academic success.Similarly, there is a high level of positive correlation between the variable "Positively affected success" and the variable "Should continue partially" ($r = .733$, $p < .01$). This shows that the perception of success is a determining factor in attitudes towards continuing distance education.

When the variables related to technical operation are examined, a strong relationship is observed between the variables "I can reach the teachers" and "There are no problems with assignments" ($r = .615$, $p < .01$). Furthermore, there is a moderate-to-high correlation between the absence of technical problems and access to instructors ($r = .547$, $p < .01$). Overall, the positive and statistically significant relationships found among all variables indicate that technical satisfaction, pedagogical perception, and success evaluations regarding the distance education process are mutually reinforcing structures.

4.3 Analysis Of Differences In Distance Education Satisfaction Levels According To Gender

Table 3

Comparison of Distance Education Perception and Satisfaction Scores by Gender (T-Test)

Variables	Gender	*N*	*M*	*SD*	*t*	*p*
S1: It was easy to get used to.	Erkek	806	3.51	1.36	3.820	.000*
	Kadın	1280	3.28	1.35		
S2: As productive as face-to-face interaction.	Erkek	806	3.14	1.48	3.754	.000*
	Kadın	1280	2.89	1.47		
S3: Partial continuation is necessary.	Erkek	806	3.42	1.43	6.464	.000*
	Kadın	1280	3.00	1.43		
S4: It had a positive impact on success.	Erkek	806	3.22	1.42	4.669	.000*
	Kadın	1280	2.93	1.41		
S5: Classes start on time.	Erkek	806	4.17	1.08	.942	.346
	Kadın	1280	4.12	1.09		
S6: I haven't experienced any technical problems.	Erkek	806	3.96	1.27	1.216	.224
	Kadın	1280	3.89	1.27		

Note: A statistically significant difference exists at the p < .05 level. Source: Research data.

Table 3 shows that there are statistically significant differences based on gender in some dimensions of the perception and satisfaction variables of distance education. In the variable "Distance education is easy to adapt to," the average score of male students (M = 3.51, SD = 1.36) is significantly higher than that of female students (M = 3.28, SD = 1.35) (t = 3.820, p < .001). This finding indicates that male students have more positive evaluations regarding adaptation to the distance education process.

Similarly, in the variable "Distance education is as effective as face-to-face education," male students (M = 3.14, SD = 1.48) have a higher average than female students (M = 2.89, SD = 1.47) (t = 3.754, p < .001).

The significant difference is even more pronounced in the variable "Should continue partially" (t = 6.464, p < .001). Male students (M = 3.42, SD = 1.43) have a more positive attitude towards the partial continuation of distance education compared to female students (M = 3.00, SD = 1.43).

Furthermore, in the variable "Distance education positively affected my success," the average score of male students (M = 3.22, SD = 1.42) was significantly higher than that of female students (M = 2.93, SD = 1.41) (t = 4.669, p < .001).

In contrast, no significant difference was found between genders in the variables "Classes start on time" (t = .942, p = .346) and "I did not experience any technical problems" (t = 1.216, p = .224) (p > .05). This finding indicates that satisfaction with the technical process is independent of gender. Overall, male students' perceptions of distance education are more positive than female students', both in terms of pedagogical and achievement aspects; however, there is no gender-based difference in technical satisfaction dimensions.

4.4 Analysis Of Differences In Distance Education Satisfaction Levels According To Age Groups (Anova Results)

Table 4

Comparison of Distance Education Satisfaction Levels According to Age Groups (ANOVA)

Variables	Age Group	*N*	*M*	*SD*	*F*	*p (Sig.)*
S1: It was easy to get used to.	17-20 Yaş	1339	3.24	1.35	13.367	.000*
	21-25 Yaş	600	3.51	1.36		
	26 ve Üstü	144	3.87	1.32		
S2: As productive as face-to-face interaction.	17-20 Yaş	1339	2.81	1.44	22.973	.000*
	21-25	600	3.20	1.51		

Variables	Age Group	*N*	*M*	*SD*	*F*	*p (Sig.)*
	Yaş					
	26 ve Üstü	144	3.69	1.40		
S3: Partial continuation is necessary.	17-20 Yaş	1339	2.99	1.41	23.838	.000*
	21-25 Yaş	600	3.36	1.46		
	26 ve Üstü	144	3.91	1.28		
S4: It had a positive impact on success.	17-20 Yaş	1339	2.89	1.39	21.321	.000*
	21-25 Yaş	600	3.21	1.43		
	26 ve Üstü	144	3.76	1.38		
S7: I can reach the teachers.	17-20 Yaş	1339	3.76	1.18	2.831	.037*
	21-25 Yaş	600	3.75	1.27		
	26 ve Üstü	144	4.03	1.22		
S5: Classes start on	17-20	1339	4.13	1.06	2.164	.090

Variables	Age Group	*N*	*M*	*SD*	*F*	*p (Sig.)*
time.	Yaş					
	21-25 Yaş	600	4.11	1.16		
	26 ve Üstü	144	4.35	1.06		
S6: I haven't experienced any technical problems.	17-20 Yaş	1339	3.90	1.26	1.055	.367
	21-25 Yaş	600	3.91	1.27		
	26 ve Üstü	144	4.06	1.29		

*Note: F: Analysis of variance value; p (Sig.): Significance value. **A statistically significant difference exists at the p < .05 level.*

Table 4 shows that satisfaction levels with distance education differ statistically significantly across age groups in some dimensions. A significant difference exists between age groups in the variable "Distance education is easy to adapt to" ($F = 13.367$, $p < .001$). Examining the mean scores, it is seen that students aged 26 and over ($M = 3.87$, $SD = 1.32$) have a higher level of adaptation to distance education compared to the 21-25 age group ($M = 3.51$, $SD = 1.36$) and the 17-20 age group ($M = 3.24$, $SD = 1.35$).

Similarly, a significant difference exists between age groups in the variable "Distance education is as effective as face-to-face education" ($F = 22.973$, $p < .001$). Students aged 26 and over ($M = 3.69$, $SD = 1.40$) evaluate distance education as more effective compared to other age groups. A significant difference was found in the variable "should continue partially" ($F = 23.838$, $p < .001$). Average scores increase with age. Students aged 26 and over ($M = 3.91$, $SD = 1.28$) have a more positive attitude towards the partial continuation of distance education. There is also a significant difference between age groups in the variable "distance education process positively affects success" ($F = 21.321$, $p < .001$). The average score of students aged 26 and over ($M = 3.76$, $SD = 1.38$) is higher than other groups. There is also a significant difference according to age groups in the variable "I can reach the instructors" ($F = 2.831$, $p = .037$). Students aged 26 and over ($M = 4.03$, $SD = 1.22$) made a more positive evaluation regarding access to instructors. In contrast, no significant difference was found between age groups in the variables "Classes start on time" ($F = 2.164$, $p = .090$) and "I did not experience any technical problems" ($F = 1.055$, $p = .367$) ($p > .05$).

Generally, it is observed that satisfaction with distance education, perception of its effectiveness, and evaluations of its success increase with age. It is particularly noteworthy that students aged 26 and over have a more positive attitude towards distance education. However, evaluations regarding technical infrastructure do not show a significant difference according to age.

4.5 Faculty Members' Views on Distance Education Satisfaction

Table 5

Distribution of Qualitative Findings Regarding Distance Education Satisfaction According to Theme, Sub-Theme and Codes

Theme	Sub-theme	Code	*n*	*%*
Instructor Competencies in Online Education	Technological Competence	Systemic dominance	31	7.7
		Addressing technical problems	70	17.4
	Pedagogical Competence	Interactive lesson delivery	53	13.2
		Planning the teaching process	19	4.7
	Communication Skills	Effective communication with students.	28	6.9
		Providing feedback	27	6.7
Comparing Online and In-Person Education	Interaction Level	Limited interaction	5	1.2
		Increasing student participation	31	7.7
	Management of the Teaching Process	Time management	42	10.4
		Controlling the lesson flow	7	1.7
The Effects of Faculty Competencies	Learning Efficiency	The effectiveness of the lesson	21	5.2
	Student Motivation	Increasing Motivation	16	4.0
General Assessment of Online Education	Quality of Education	Learning outcomes	49	12.2
	Developmental Needs	In-service training requirement	7	1.7

Note: n: Number of participants who specified the relevant code; %: Percentage of total opinions.

Analysis of the qualitative data obtained from open-ended questions revealed that opinions regarding teaching staff in the online education process were grouped under four main themes. These themes are: (1) teaching staff competencies in online education, (2) comparison of online and face-to-face education, (3) effects of teaching staff competencies, and (4) general evaluation of online education. The frequency distributions of the obtained themes, sub-themes, and codes are presented in Table 5.

Instructor Competencies in Online Education

Participant opinions indicate that instructor competencies in online education are addressed in three main dimensions: technological, pedagogical, and communicative. The fact that the most frequently cited code under this theme is "intervention in technical problems" (n = 70, 17.4%) reveals that digital competencies play a critical role in the online teaching process. Furthermore, the significant frequency of mentioning "system mastery" and "interactive lecture delivery" codes shows that technical and pedagogical competencies should be evaluated together.

Participants stated that a lack of system knowledge negatively affects the flow of lessons and the learning process. This indicates that instructors in online education should be equipped not only with subject matter knowledge but also with digital pedagogical competencies.

In the context of communication skills, the codes "providing feedback" and "effective communication with students" stand out. This finding shows that the sustainability of interaction in the online environment depends on the instructor's communication skills.

Comparison of Online and Face-to-Face Education

Participants, when comparing online and face-to-face education environments, particularly focused on the level of interaction and the management of the teaching process. The code "limited interaction" indicates a decrease in spontaneous interaction in online education, while the code "increasing student participation" shows that the instructor must make conscious efforts to compensate for this deficiency. The high frequency of the code "time management" (n = 42, 10.4%) within the scope of managing the teaching process reveals that planning and structuring have gained importance in online courses. This finding shows that online teaching requires more preparation and systematic organization.

The Effects of Instructor Competencies

The codes "course efficiency" and "increasing motivation" under this theme show that the instructor's level of competence is directly related to learning outcomes. Participants stated that pedagogically qualified instructors conduct online courses more effectively and increase students' motivation to participate in the course.

This finding reveals that the instructor's role has become more visible and decisive in the online environment.

General Assessment of Online Education

The fact that the code "learning outcomes" has a remarkable frequency under the general assessment theme (n = 49, 12.2%) shows that the quality of online education is closely related to the performance of the

instructor. In addition, the code "in-service training need" reveals that instructors need professional development support.

These findings point to the importance of institutional support mechanisms and in-service training programs for the sustainable and high-quality implementation of online education.

5. DISCUSSION

In this research, the distance education process was examined through two different stakeholder groups: quantitative data were obtained from university students, and qualitative data were obtained from teaching staff. In this respect, the study offers a holistic evaluation that addresses distance education from both the learner's and the teacher's perspectives.

Discussion of Quantitative Findings Based on Student Opinions

The quantitative findings obtained from students show that satisfaction with the technical operation of distance education is relatively high, but more cautious evaluations are made regarding pedagogical effectiveness and equivalence to face-to-face education. In particular, the high averages of variables such as "on-time start of classes" and "no technical problems" reveal that the institutional infrastructure is considered functional. This finding is consistent with studies emphasizing that technical infrastructure is a key determinant in the sustainability of distance education (Moore & Kearsley, 2012).

However, the lower averages in the variables of "distance education being as effective as face-to-face education" and "positively affecting success" indicate that students exhibit a more critical attitude towards learning outcomes. This is consistent with the Community of Inquiry model, which reveals the decisive role of interaction, instructional design, and instructional presence on learning quality in online learning (Garrison, Anderson & Archer, 2000). Even in a technically smooth system, students consider pedagogical effectiveness as a separate evaluation criterion.

Correlation analysis results show a strong relationship between students' perceptions of "efficiency" and "contribution to success." This finding reveals that perceived teaching quality is directly linked to academic achievement assessment (Anderson, 2008). Students' perception of success largely depends on the quality of the learning experience.

Findings regarding gender differences showed that male students had higher perceptions of the effectiveness of distance education. The literature indicates that perceptions of self-efficacy towards technology may differ based on gender (Venkatesh & Morris, 2000). However, the lack of significant differences in technical variables suggests that infrastructure experience is independent of gender.

Findings regarding the age variable revealed that perceptions of distance education become more positive as age increases. This result is significant when evaluated within the framework of adult learning theory (Knowles, Holton & Swanson, 2015). Adult learners may have a more positive approach to distance education due to the advantages of flexibility and time management.

Discussion of Qualitative Findings Based on Faculty Opinions

The qualitative findings obtained from faculty members show that faculty competencies play a central role in the distance education process. Participating faculty members emphasized technological, pedagogical, and communicative competencies as key dimensions. This supports the importance of the TPACK (Technological Pedagogical Content Knowledge) model in the context of distance education (Mishra & Koehler, 2006).

Faculty members' system proficiency and ability to intervene in technical problems were expressed as a factor directly affecting the flow of the course. However, pedagogical planning, interactive course design, and strategies to increase student participation emerged as key factors determining the quality of online teaching. This finding parallels research that emphasizes the decisive role of the instructional presence in the online learning experience (Shea & Bidjerano, 2009).

Faculty members also stated that online and face-to-face education differ in the interaction dimension. This is consistent with theoretical approaches that argue for the conscious construction of social presence in online environments (Garrison et al., 2000).

Holistic Evaluation of Quantitative and Qualitative Findings

When student and faculty opinions are evaluated together, it is seen that distance education is functional from a technical point of view; however, it has aspects that need to be improved in terms of pedagogical effectiveness. While students question pedagogical effectiveness, faculty members state that pedagogical and technological competencies need to be strengthened. This situation shows that distance education is not only a technological transformation but also a pedagogical restructuring process.

6. CONCLUSION

In this research, the distance education process was examined in a multidimensional way, considering both student and faculty perspectives. Quantitative findings revealed the satisfaction levels of students with distance education, while qualitative findings reflected the evaluations and perceptions of competence of faculty members regarding the process. The results show that the technical and pedagogical dimensions of distance education are perceived at different levels.

Students reported a relatively high level of satisfaction with variables related to the technical operation of distance education (on-time start of classes, limited technical problems, etc.). This indicates that the institutional digital infrastructure has a functional and sustainable structure. However, perceptions that distance education is as efficient as face-to-face education and positively affects academic success remained at a lower level. This result reveals that technical competence alone does not guarantee the quality of learning; pedagogical design and interaction are decisive in the learning experience.

Analyses regarding gender and age variables showed that perceptions of distance education differed according to demographic characteristics. While male students had higher perceptions of the effectiveness of distance education, it was determined that the level of satisfaction increased with age. The more positive attitude of students, especially those aged 26 and over, towards distance education can be attributed to their flexibility and self-regulated learning skills.

Qualitative findings obtained from faculty members revealed that technological, pedagogical, and communicative competencies are of central importance in distance education. Faculty members emphasized that elements such as system mastery, interactive course design, time management, and providing feedback to students directly affect the quality of online teaching. Furthermore, it was stated that the main difference between online and face-to-face learning environments is concentrated at the level of interaction.

When quantitative and qualitative findings are evaluated together, it is concluded that distance education is largely functional from a technical point of view; however, pedagogical effectiveness needs to be strengthened. Faculty competencies are seen to play a decisive role in increasing student satisfaction. This

situation shows that distance education should be supported not only by technological infrastructure investments but also by the development of pedagogical capacity.

In conclusion, a holistic approach that centers both student experience and faculty competencies is needed for distance education to be conducted in a sustainable and high-quality manner.

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