

**Level of preclinical student’s satisfaction and coping with online learning during COVID-19 pandemic at king Saud University - Opportunity for blended learning**

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**Abstract**

**Objectives:** To investigate the students' satisfaction and coping with online compared to traditional learning. Also, to determine their opinion about knowledge gained and hybrid online/traditional education for the future.

**Methods:** We conducted a cross-sectional study between October 2020 and March 2021 using an online self-administered questionnaire. The sample size was estimated to be 156. However, we invited all Pre-clinical second-year medical students, 266 (male 182, female 84). The data collection tool is composed of four main categories and a total of 56 validated statements. Five options followed the statements: strongly disagree, disagree, neutral, agree, and strongly agree. We use the

score of 1 to represent "I strongly disagree" and 5 to represent "I strongly agree."

**Results:** One hundred and sixty-two students participated in our study. The study showed a (56.8%) are satisfied and coped well with online teaching. It was reported that 73.2% of females had more success in managing their transition into online learning in comparison to 50.5% of males (p-value 0.01). Female students had a higher median(IQ) of 39(6) compared to males 37(7) regarding Attitudes and style of using network and information technologies(p-value 0.05).

After returning to physical classrooms, 74.6% of female students preferred some form of a mixture of physical classrooms and online learning more than their male counterparts' 54.9% (p-values 0.01). Also, 94.4%, female

students had all the necessary network and computer resources for online teaching compared to 76.9% of male students (p-values 0.01).

Also, one-third of students claimed to gain more knowledge online teaching.

Females more than male students felt that a lot of information could not be properly shared digitally, 64.8%, 52.7% respectively (p-values 0.05).

**Conclusion:** Satisfaction and coping well with online learning were reported by more than half of the subjects. Female students showed more preference for online learning. Further, they were satisfied with the resources needed. Also, students would prefer a mixture of online and physical classrooms. The authors recommend increasing online learning gradually until the proper balance of online/physical teaching is found.

**Keywords:** Online learning, Traditional learning, Student's satisfaction, Medical students, blended learning

### **Introduction**

Online learning uses technology and the Internet to interact with the content, instructor, and other learners to acquire knowledge. It is classified as asynchronous and synchronous. In Asynchronous learning, the learning material can be accessed any time, while in synchronous learning, there are real-time interactions between students and instructors. [1]

The usage of Online learning in higher education has increased worldwide in the emerging of the coronavirus 2019 (COVID-19) pandemic [2-4]. Moreover, in Saudi Arabia, on the 8th of March 2020, the ministry of education announced the suspension of students' attendance to schools and universities and directed them to use online learning as an alternative.

The implementation of online learning may face some barriers in medical education. A study showed that the

barriers were time constraints, poor technical skills, inadequate infrastructure, absence of institutional strategies and support, and negative attitudes [5]. Another study reported that medical students might face difficulty adjusting to learning styles, perform responsibilities at home, and poor communication between teachers and students as barriers to online learning [6].

Students' satisfaction with online learning is variable. Some studies investigated students' satisfaction over multiple styles [7], multiple modes [8]. Others focused on measuring factors that affect satisfaction [9] and how the satisfaction can affect other variables such as cognitive engagement [10].

The knowledge, skills, and behaviours are associated with a hugely positive effect on virtual learning. It does not remain easy to measure online efficacy compared to traditional learning, in which studies showed discrepant and little difference. [11]

There has been active research investigating health students' satisfaction, such as Dentists, nurses in Saudi Arabia [12-14]. However, getting medical students to share their satisfaction and performance level is a new contribution in this field.

Our study aimed to measure the students' satisfaction and coping with online learning. Also, to determine their opinion about knowledge gained and hybrid online/traditional education for the future.

### **Methods**

This quantitative observational cross-sectional study took place at the college of medicine at King Saud University between October 2020 and March 2021. This study targeted second-year medical students as they experienced the traditional teaching previously. Also, they were in their clinical years, and the majority of the classes are theoretical lectures. The inclusion criteria

were second-year medical students of both sexes at the college of medicine at King Saud University. At the same time, students of other levels or universities were excluded.

The "single proportion" formula was used, with a proportion level of satisfaction of 72.6% [16], and confidence interval of 95%, and an accuracy (precision) of 7%. The sample size was calculated to be 156. We invited all the students at this level, 266 (male 182, female 84). We divided the students into two strata, depending on gender.

The investigators used an online self-administered questionnaire on Google Forms as a data collection tool sent electronically to the participants. The questionnaire was titled "questionnaire for students about the transition to online teaching and future teaching." It is composed of four main categories and a total of 56 validated statements [15]. The categories were: 1. Transition to online learning 2. Current online classes 3. Return to physical classrooms. 4. Attitudes and style of using network and information technologies. The second category was further divided into six sub-categories: 1. General impression about online classes 2. Technical-technological aspects of online teaching 3. The difference between physical and online classrooms 4. Quality of teaching 5. Group studying 6. Online knowledge assessment. In addition to students' gender. Five options followed the statements: strongly disagree, disagree, neutral, agree, and strongly agree. We use the score of 1 to represent "I strongly disagree" and 5 to represent "I strongly agree."

At the college of medicine, the Institutional Review Board, King Saud University, approved our study (Ref. No. 21/0098/IRB – approval date: 20/01/2021). All the participants signed written informed consent. Also,

participants' anonymity was assured, and there were no incentives or rewards given to participants.

Data collection and organization were performed using Excel software (version 16.0). Moreover, IBM SPSS (Version 21.0. Armonk, NY: IBM Corp.) was used for Statistical analysis. We presented the data as frequencies and percentages. The Chi-Square test was used. Due to the lack of normality of data, we compared the median(range) of the questionnaire score amongst male and female students. Mann-Whitney test was used to measure the association between the various categories of the questionnaire and students' gender. The  $P < 0.05$  denoted statistically significant differences.

### **Results**

One hundred sixty-two students (91 males and 71 females) responded, with around (61%) responses rate from 266 students in the second medical year. The response for male students 91/182(50%), and female students, 71/84(84.5%)

Table 1 illustrates Students' agreement to statements in the category "Transition to online learning by their gender. The transition statements' overall agreement to the online learning category ranged from 16.5% to 84.6 % among males and 14.1% to 94.4% among females. The highest agreement was with the statement, "from the beginning; I had network and computer resources for online learning." In contrast, the lowest agreement was with the statement, "Working with the Moodle platform used for online testing was a challenge for me." However, the agreement on the statements "Working with the Zoom platform for online learning was a challenge and Working with the Moodle platform used for online testing was a challenge for me" were 15% and 27%, respectively. Female students agreed on the statements (I had previous experience in teaching online

courses, Students have successfully managed with the Transition to Zoom online classes.) more than their male students' counterparts (p-values 0.01, 0.01), respectively. Table 2 Illustrates Students' agreement to statements in the category "Current online classes" by their gender. It was divided into six sub-categories. The general impression showed that (57.8%) of our participants, males(49.5%), females(66.2%), are satisfied with how they have coped with online teaching. Nevertheless, when we compared male to female students, there was no statistically significant difference between them. The agreement with the current online classes category's statements ranged from 18.7% to 83.5 % among males and 8.5% to 97.2% among females. The highest agreement was with the statement, "To attend online classes, I connect to the Internet via Wi-Fi." While the lowest agreement was with the statement, "I sometimes follow online classes with the family members who are not students." Category (Technical-technological aspects of online teaching) demonstrates that female students 94.4%,97.2% agreed on the statements (I have all necessary network and computer resources for online teaching, and To attend online classes, I connect to the Internet via Wi-Fi) more than their male students counterpart76.9%,83.5% (p-values 0.01, 0.01) respectively. While male students24.3%, 22.0% agreed on the statements (I use a desktop computer for online learning, to attend online classes, and I connect to the Internet via a network cable.) more than their female students counterpart5.6%, 8.5% (p-values 0.016, 0.029) respectively. Category (The difference between physical and online classrooms) demonstrates that male students28.6% agreed on the statements (I attend more classes online than I would in a physical classroom) more than their female students' counterparts 25.4 (p-values

0.04). Category (Quality of teaching) demonstrates that Female students 74.6%, 66.2% agreed on the statements (I rather watch class recordings than attend live online classes, and It is good that the teacher uses an electronic whiteboard for some courses.) more than their male students counterpart52.7%, 49.5% (p-values 0.01, 0.02) respectively. Categories (General impression about online classes, Group studying, and Online knowledge assessment) did not demonstrate any significant differences between male and female students.

Table 3 Illustrates Students' agreement to statements in the category "Return to physical classrooms" by their gender. The overall agreement with the physical classrooms category statements ranged from24.2% to 64.8% among males and 33.8% to 74.6% among females. The lowest agreement was with the statement, "Upon termination of the state of emergency, all online classes should be discontinued."

Female students 74.6% agreed with the statement (Within one course, it makes sense that a part of the lecture is in physical classrooms and another part online.) more than their male students' counterparts 54.9% (p-values 0.01). Furthermore, male students41.8% agreed with the statement (All classes except practical exercises should be continued exclusively online.) more than their female students' counterparts 39.4% (p-values 0.01).

Table 4 illustrates Students' agreement to statements in the category "Attitudes and style of using network and information technologies" by their gender. The Attitudes and style of using network and information technologies statements agreement ranged from 22.0% to 65.9 % among males and 31.0% to 84.5% among females.

Female students 64.8%,84.5% agreed with the statements "I think that there is a lot of information that cannot be properly shared digitally, and I use social networks to

share important information and content with colleagues.) more than their male students' counterpart 52.7%,61.5% (p-values 0.05, 0.01) respectively.

Table 5 Illustrates The median scores of the students' agreement to statements in all categories by their gender. Female students had a higher median(IQ) of 39(6) compared to males 37(7) regarding (Attitudes and style of using network and information technologies section). It was a statistically significant difference (p-value 0.05).

### **Discussion**

Generally, 57.8% of our students were satisfied with how they have coped with online teaching. However, this finding was lower than the previous study of 72.6% [16]. Although the female students were more satisfied than their male counterparts, there was no statistically significant difference between them. This finding of low satisfaction among our participants may be attributed to new experiences. Globally the level of satisfaction had increased gradually since the early 2000s compared to the years that preceded the pandemic [7, 8, 17]. Although, the experience cannot be completely compared due to the current circumstances of the pandemic. Students had an emergency transition, not a planned one [10]. Our finding conformed with other studies done in Qassim University, which found a level of satisfaction of (58.8%, 67.3%) [18, 19] and the study conducted in Pakistan(56%) [20]. However, comparing previous studies during the pandemic showed great variabilities. A study claimed high satisfaction levels (88.6%) [21]. On the contrary, other studies found that only (23%, 23.1%) had a positive perception toward e-learning [22, 23]. Such a finding can also be related to the rapid and sudden change in teaching and using a new means of conducting lectures and assessments. Also, other researchers attributed it in part to the grade's achievement, which

many students viewed as no longer reflected their performance [14]. Furthermore, other reasons could be slower or more difficult communication processes with faculty or means of communication as a whole [13].

Our finding reported that females (73.2%) had more success in managing their transition into online learning in comparison to males (50.5%) (p-value 0.01). Also, it is noteworthy that the majority of females (67.6%) had previous experience in attending online courses compared to males (44.0%) (p-value 0.01). Understandably, fast coping with e-learning would be associated with previous experience. This association is similar to the findings of previous studies. [24, 25].

When comparing the possession of the necessary resources, the vast majority of male (76.9%) and female (94.4%) students had all the necessary network and computer resources (p-value 0.01). Also, Wi-fi was used by (83.5% of males) and (97.2% of females) (p-value 0.01). This result was similar to a previous study [26]. On the other hand, desktop computer and network cable were not popular as it was used by about one-fourth of male students and less than 10% of female students (p-value 0.01, 0.02) respectively. However, we did not find published literature that compared this point between male and female students.

Nevertheless, previous studies supported our findings that most students, regardless of gender, used Wi-Fi and laptops more than other modalities [27,28]. Although, it was claimed in both studies that students use smartphones and tablets more than laptops, which was in contrast to our study. Such findings showed that the use of Wi-Fi and laptop gives the Student more flexibility in studying. Generally, Internet use is high (95.7%) among the public in Saudi Arabia [29].

Social media is very popular in Saudi Arabia as 18.3 million (58%) individuals use various social media types [30]. This finding was reflected among our participants as (84.5%) of female students and (61.5%) of male students used social media to share important information and content (p-value 0.01). Other studies stated that social media usage is highly prevalent among medical students (87.7%, 93.4%) [28, 29]. The high popularity of social media is not surprising as it contains a lot of study materials and resources that help students gain more knowledge and a better understanding of various subjects. Also, it makes sharing information much easier and accessible by students at their convenient time and place.

Our findings demonstrated that about one-fourth of students preferred to attend more online than physical classes. However, male students (28.6%) were more than female students (25.4%) in this aspect (p-value 0.040). While between (52.7% to 74.6%) of students preferred watching recorded classes favouring female students (p-value 0.01). Also, the female students (66.2%) agreed to use an electronic whiteboard more than male students (49.5%) (p-value 0.025). These results demonstrate how recordings can significantly affect students' perception of e-learning. About one-third of students agreed that their knowledge gained through online learning was higher than traditional physical learning. Nevertheless, no significant sex differences were observed. A systematic review by the World health organization (WHO) examined global e-learning versus traditional learning, reported that 11 studies (33%) demonstrated statistically significant knowledge gains [33].

Our study showed a broad spectrum of opinions on how to conduct classes after return to physical classrooms. About (40%) of all students prefer exclusive online

teaching with minor differences favouring male students (p-value 0.001). Further, about (70%) of students preferred that some courses be in physical classrooms and online for the others in favour of female students (p-value 0.030). While other students (74.6% females) and (54.9% males) felt that within one course, it makes sense that a part of the lecture is in physical classrooms and another part online (p-value 0.01). Other similar findings showed that (68.6%) students expressed a desire to have > 90% of the future lectures online. While (2.9%) preferred to have < 10% of the lectures online, and none preferred to have only traditional classes [21]. Such results may reflect some of the students' difficulties in some courses' aspects, such as the practical parts.

The students gave positive agreement to some statements such as (Sometimes I act like "I am an internet addict," "I organize my digital content efficiently," "I am usually the one who advises the others on how to solve technical problems concerning their digital devices"). This finding reflected the positive attitudes and style of using network and information technologies.

The median scores and range of female students (39[6.0]) were higher than that of their male counterparts (37[7.0]) with (p-value 0.050). The no significant difference between male and female students in this aspect was consistent with a previous study [34].

### **Limitations**

Our study has some limitations. First, the lack of generalizability because it is done in a single university only. We intended to conduct a short-time preliminary assessment in the college of medicine necessary for future planning. Exact grades and knowledge impact comparing to traditional learning could not be obtained during this short period; it is beyond this study's impact. These issues should be investigated in further studies.



Furthermore, this study is based on an online questionnaire, which is susceptible to many response biases, especially extreme responses where people tend to answer neutral responses.

### Conclusion

Satisfaction and coping well with online learning were reported by more than half of the students. Female students showed more preference for online learning. Further, they were satisfied with the resources needed, such as Wi-Fi and devices. Also, students would prefer online learning of some of the courses after returning to physical classrooms. Also, a third of students felt that they gained more knowledge through e-learning.

### Recommendations

The authors recommend including online learning in theoretical subjects. Furthermore, gradually increasing until they find the proper balance of online/physical teaching. This is an Opportunity for blended learning. More research is needed to evaluate online learning's impact on students' knowledge and the performance assessment. Further, a cost-effective assessment of this experience should be evaluated.

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Table 1: Students' agreement to statements in the category "Transition to online learning by their gender [n=162]

Statements	Male [n=91] (100%)			Female [n=71] (100%)			p-value
	Agree N (%)	Neutral N (%)	Disagree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	
It is good that the classes	62 (68.1)	16 (16.9)	13 (14.3)	50 (70.4)	9(12.7)	12 (16.9)	0.66

immediately transitioned to the online teaching with Zoom.							
The instructions for transition to the Zoom online classes were clear to me.	66 (72.5)	15 (16.5)	10 (11.0)	52 (73.2)	12 (16.9)	7 (9.9)	0.97
From the beginning, I had network and computer resources for online learning.	77 (84.6)	6 (6.6)	8 (8.8)	67 (94.4)	1 (1.4)	3 (4.2)	0.12
I had previous experience of attending online courses.	40 (44.0)	16 (17.6)	35 (38.5)	48 (67.6)	6 (8.5)	17 (23.9)	0.01
Working with the Zoom platform for online learning was a challenge for me.	27 (29.7)	24 (26.4)	40 (44.0)	16 (22.5)	12 (16.9)	43 (60.6)	0.10
Working with the Moodle platform used for online testing was a challenge for me.	15 (16.5)	52 (57.1)	24 (26.4)	10 (14.1)	42 (59.2)	19 (26.8)	0.91
The educational institution has successfully managed the transition to the Zoom online classes.	53 (58.2)	20 (22.0)	18 (19.8)	47 (66.2)	16 (22.5)	8 (11.3)	0.33
Teachers have successfully managed the transition to the Zoom online classes.	50 (54.9)	19 (20.9)	22 (24.2)	42 (59.2)	15 (21.1)	14 (19.7)	0.78
Students have successfully managed the transition to the Zoom online classes.	46 (50.5)	25 (27.5)	20 (22.0)	52 (73.2)	13 (18.3)	6 (8.5)	0.01

Table 2: Students' agreement to statements in the category "Current online classes" by their gender [n=162]

Statements	Male [n=91] (100%)			Female [n=71] (100%)			p-value
	Agree N (%)	Neutral N (%)	Disagree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	

<b>2.1 General impression about online classes</b>							
I am satisfied with how I cope with online learning.	45 (49.5)	19 (20.9)	27 (29.7)	47 (66.2)	10 (14.1)	14 (19.7)	0.10
<b>2.2 Technical-technological aspects of online teaching</b>							
I have all necessary network and computer resources for online learning.	70 (76.9)	6 (6.6)	15 (16.5)	67 (94.4)	4 (5.6)	0 (0.0)	0.01
Occasional interruptions and technical problems hinder my online learning.	42 (46.2)	25 (27.5)	24 (26.4)	42 (59.2)	19 (26.8)	10 (14.1)	0.12
I use a smartphone for online learning.	25 (27.5)	14 (15.4)	52 (57.1)	18 (25.4)	9 (12.7)	44 (62.0)	0.80
I use a desktop computer for online learning.	22 (24.2)	13 (14.3)	56 (61.5)	4 (5.6)	1 (1.4)	66 (93.0)	0.01
I use a laptop for online learning.	47 (51.6)	15 (16.5)	29 (31.9)	41 (57.7)	6 (8.5)	24 (33.8)	0.31
I use a tablet for online learning.	62 (68.1)	12 (13.2)	17 (18.7)	59 (83.1)	5 (7.0)	7 (9.9)	0.09
To attend online classes, I connect to the Internet via Wi-Fi.	76 (83.5)	10 (11.0)	5 (5.5)	69 (97.2)	2 (2.8)	0 (0.0)	0.01
To attend online classes, I connect to the Internet via a network cable.	20 (22.0)	9 (9.9)	62 (68.1)	6 (8.5)	4 (5.6)	61 (85.9)	0.02
<b>2.3 The difference between physical and online classrooms</b>							
At home, more than in the university premises, I am concerned about missing my class.	32 (35.2)	18 (19.8)	41 (45.1)	27 (38.0)	21 (29.6)	23 (32.4)	0.19
The saving of the commuting time, which was brought by online learning, is important to me.	62 (68.1)	17 (18.7)	12 (13.2)	53 (74.6)	14 (19.7)	4 (5.6)	0.27
I attend more classes online than I would in a physical classroom.	26 (28.6)	23 (25.3)	42 (46.2)	18 (25.4)	8 (11.3)	45 (63.4)	0.04
I think that the online teaching has increased the degree of interaction	26 (28.6)	16 (17.6)	49 (53.8)	12 (16.9)	9 (12.7)	50 (70.4)	0.09

with teachers and other students, compared with the teaching in physical classrooms.							
I learn more efficiently in the physical classroom than at home.	39 (42.9)	32 (35.2)	20 (22.0)	25 (35.2)	29 (40.8)	17 (23.9)	0.60
<b>2.4 Quality of teaching</b>							
I rather watch class recordings than attend live online classes.	48 (52.7)	21 (23.1)	22 (24.2)	53 (74.6)	9 (12.7)	9 (12.7)	0.01
I watch a recorded lecture more than once.	33 (36.3)	18 (19.3)	40 (44.0)	30 (42.3)	13 (18.3)	28 (39.4)	0.73
It is important for me to see the teacher's face during the online classes.	32 (35.2)	31 (34.1)	28 (30.8)	22 (31.0)	22 (31.0)	27 (38.0)	0.62
It is good that the teacher uses an electronic whiteboard for some courses.	45 (49.5)	36 (39.6)	10 (11.0)	47 (66.2)	14 (19.7)	10 (14.1)	0.02
I think that the level of knowledge gained through online learning is higher than that gained in the physical classroom.	34 (37.4)	25 (27.5)	32 (35.2)	19 (26.8)	29 (40.8)	23 (32.4)	0.16
The applicability of online learning varies drastically from course to course.	47 (51.6)	37 (40.7)	7 (7.7)	45 (63.4)	23 (32.4)	3 (4.2)	0.29
Online teaching has stimulated my interest in network technologies.	38 (41.8)	26 (28.6)	27 (29.7)	28 (39.4)	14 (19.7)	29 (40.8)	0.25
<b>2.5 Group studying</b>							
I regularly coordinate learning and assignments with my fellow students.	32 (35.2)	26 (28.6)	33 (36.6)	21 (29.6)	20 (28.2)	30 (42.3)	0.68
I sometimes follow online classes with the family members who are not students.	17 (18.7)	19 (20.9)	55 (60.4)	6 (8.5)	12 (16.9)	53 (74.6)	0.10
<b>2.6 Online knowledge assessment</b>							

I feel more anxious before an online knowledge test than before a knowledge test in the physical classroom.	19 (20.9)	35 (38.5)	37 (40.7)	11 (15.5)	25 (35.2)	35 (49.3)	0.49
I think that the regularity of online knowledge assessment is ensured.	31 (34.1)	44 (48.4)	16 (17.6)	28 (39.4)	34 (47.9)	9 (12.7)	0.62
I think that online assessments are an objective way of knowledge evaluation.	37 (40.7)	41 (45.1)	13 (14.3)	32 (45.1)	31 (43.7)	8 (11.3)	0.78
I think that the time allotted for online tests is sufficient.	38 (41.8)	41 (45.1)	12 (13.2)	26 (36.6)	32 (45.1)	13 (18.3)	0.62

Table 3: Students' agreement to statements in the category "Return to physical classrooms" by their gender [n=162]

Statements	Male			Female			p-value
	Agree N (%)	Neutral N (%)	Disagree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	
Upon termination of the state of emergency, all online classes should be discontinued.	22 (24.2)	28 (30.8)	41 (45.1)	24 (33.8)	16 (22.5)	31 (43.7)	0.31
All classes except practical exercises should be continued exclusively online.	38 (41.8)	27 (29.7)	26 (28.6)	28 (39.4)	6 (8.5)	37 (52.1)	0.01
I think that lectures for some courses should be in physical classrooms and online for the other.	59 (64.8)	23 (25.3)	9 (9.9)	52 (73.2)	7 (9.9)	12 (16.9)	0.03
Within one course, it makes sense that a part of the lecture is in physical classrooms and another part online.	50 (54.9)	28 (30.8)	13 (14.3)	53 (74.6)	7 (9.9)	11 (15.5)	0.01
All classes should be held in physical classrooms, broadcasted live, and recorded at the same time.	38 (41.8)	29 (31.9)	24 (26.4)	42 (59.2)	15 (21.1)	14 (19.7)	0.08
Colloquia and exams must be	57 (62.6)	19 (20.9)	15 (16.5)	38 (53.5)	20 (28.2)	13 (18.3)	0.46

returned to physical classrooms, so that students are less tempted to cheat.							
In the future, I will use teleconferencing more.	53 (58.2)	22 (24.2)	16 (17.6)	47 (66.2)	18 (25.4)	6 (8.5)	0.23

Table 4: Students’ agreement to statements in the category “Attitudes and style of using network and information technologies” by their gender [n=162]

Statements	Male [n=91] (100%)			Female [n=71] (100%)			p-value
	Agree N (%)	Neutral N (%)	Disagree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	
I am well acquainted with the functioning of the Internet, its standards and technological concepts.	60 (65.9)	27 (29.7)	4 (4.4)	41 (57.7)	28 (39.4)	2 (2.8)	0.40
Sometimes I act like I'm an internet addict.	50 (54.9)	23 (25.3)	18 (19.8)	39 (54.9)	18 (25.4)	14 (19.7)	1.00
I implement security measures for the various digital devices I use,	41 (45.1)	32 (35.2)	18 (19.8)	40 (56.3)	14 (19.7)	17 (23.9)	0.09
I think that there is a lot of information that cannot be properly shared digitally.	48 (52.7)	26 (28.6)	17 (18.7)	46 (64.8)	9 (12.7)	16 (22.5)	0.05
It happens to me that I permanently lose some digital information that I saved earlier.	28 (30.8)	29 (31.9)	34 (37.4)	29 (40.8)	14 (19.7)	28 (39.4)	0.18
I use social networks to share important information and content with colleagues.	56 (61.5)	27 (29.7)	8 (8.8)	60 (84.5)	4 (5.6)	7 (9.9)	0.01
I have accepted the algorithmic programming way of thinking and I use it in learning as well.	20 (22.0)	51 (56.0)	20 (22.0)	22 (31.0)	40 (56.3)	9 (12.7)	0.20



I organize my digital content efficiently.	46 (50.5)	28 (30.8)	17 (18.7)	45 (63.4)	18 (25.4)	8 (11.3)	0.22
I am usually the one who advises the others on how to solve technical problems concerning their digital devices.	32 (35.2)	28 (30.8)	31 (34.1)	32 (45.1)	18 (25.4)	21 (29.6)	0.43
I believe that society can be changed if enough people sign online petitions.	36 (39.6)	39 (42.9)	16 (17.6)	38 (53.5)	28 (39.4)	5 (7.0)	0.07
I think I can find a good balance between online and offline life.	44 (48.4)	27 (29.7)	20 (22.0)	35 (49.3)	25 (35.2)	11 (15.5)	0.53

Table 5: The median scores of the students' agreement to statements in all categories by their gender [n=162]

Overall categories	Male 91()	Female 71()	Z	p-value
	Median (IQR)	Median (IQ)		
Transition to online learning (3-11)	31[5.00]	33[5.00]	-1.286	0.19
Current online classes (12-38)	84[12.00]	85[13.00]	-0.297	0.76
Return to physical classrooms (39-45)	24[5.00]	25[7.00]	-1.352	0.17
Attitudes and style of using network and information technologies (46-56)	37[7.00]	39[6.00]	-1.956	0.05