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Studying Habits in Higher Education Before and After the Outbreak of the COVID-19 Pandemic

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The COVID-19 pandemic has caused many changes in all areas, including education. In this paper, we discuss the changes in the studying habits of higher education students brought about by the new modes of education. The research was conducted in Slovenia at the University of Maribor on a sample of 272 students. We investigated whether there had been changes in studying time, studying space, mode of studying and learning during lectures, social elements, and the advantages and barriers of distance learning. We found differences in certain studying habits related to the time and space of studying which are mainly associated with the prohibition of movement and socializing outside the household. We noticed a decline in motivation and its connection with lowering learning goals and students finding it harder to focus on learning. However, we also found that the new mode of studying brings greater flexibility for students, so some want to continue to study in this way.

Keywords: studying habits, higher education, online education, pandemic, COVID-19

Introduction

The spread of the COVID-19 pandemic has affected all sectors of society and education in particular (Flores & Gago, 2020). Rahiem (2021) says that the transition to working and studying from home, which took place rapidly, caused numerous issues for the education sector, including higher education, with university students dealing with significant obstacles to their learning process. The outbreak of COVID-19 resulted in a digital revolution in the higher education system, with online lectures, teleconferencing, digital open books, online examination and interaction in virtual environments (Strielkowski, 2020, cited in Kapasia et al., 2020).

For some students and teachers, this has meant enormous changes in the educational process. Not all of them are used to working online using various platforms and learning management systems, nor are they used to not seeing their peers face to face. Students are confronted with various challenges, some of which could become a real problem. Farooq, Rathore, and Mansoor (2020) identified difficulties such as lack of institutional support, lack of student engagement, difficulties with internet accessibility, issues with online assessments and broader

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problems with understanding online education dynamics. Kapasia et al. (2020) showed that students face stress, depression, anxiety, poor network connectivity and an unfavourable study environment. Learning at home can be made difficult by siblings and other distractions. Rahiem (2020), cited in Raheim (2021), on the other hand, found out that learning remotely at home allowed students the flexibility to control their own time, which provided them with additional time for self-care and family. Rahiem's (2020) study also explained the technology barriers and challenges in using ICT. Students face device issues such as incompatible devices and sharing devices with other family members; internet connectivity issues such as unstable connection and limited or non-available internet access; the costs of internet access and new devices; and the skills needed for using new programs and apps.

All these changes, challenges and problems influence the way students learn and their studying habits. In our research, we wanted to determine whether students had changed their studying habits during the COVID-19 pandemic, i.e., whether the pandemic has influenced the way students learn. Are specific changes in studying habits related to inadequate ICT equipment, poor internet connection, less accessibility to teachers, reduced communication with classmates and reduced collaboration with classmates? And has the motivation of students to learn during the pandemic fallen?

Theoretical Background

Studying habits can be described as methods and means of obtaining information (Urh & Jereb, 2014). This may take place at the conscious or unconscious level. They help students organize their efforts to solve problems, develop skills, acquire knowledge and complete school obligations (Carter, Bishop & Kravits, 2011). In the psychology literature, habits are usually defined as behaviours activated automatically by recurring environmental cues and are seen as being typically formed through repetitive behaviour and learned stimulus–response associations (Volpp & Loewenstein, 2020). Habit formation is the process by which actions become automatic. We can create habits without intending to acquire them. Or we can cultivate or eliminate them intentionally (Psychology Today, 2021). Habits are routines of mostly subconscious regular repetition behaviour (Urh & Jereb, 2014, cited in Butler & Hope, 1995). Once patterns are developed, people take actions without a conscious decision to do so without the behaviour being proximally motivated by the deliberate pursuit of specific goals (Gardner, 2015). Old habits are hard to break and new ones are hard to form. That is because the behavioural patterns we repeat most often are etched into our neural pathways. Habits may persist even when attention or motivation declines. The good news is that it is possible to form new habits (Psychology Today, 2021). An important implication is that to change behaviour, one must often undo existing habits by managing exposure to cues and creating new patterns (Wood & Rünger, 2016).

Good studying habits are vital for improving learning and retention capacity, and they are not difficult to pick up. Undoubtedly, students face many issues in

their daily lives which compete for their attention (Ho, 2020). As already mentioned, the COVID-19 pandemic raised many additional obstacles students must overcome. What makes it difficult for a student to focus on learning. The issues the pandemic raised will never go away completely. Students need to be proactive and improve their studying habits, which can help them study over a given period of time. They need to realize why studying habits are essential and cultivate them to enhance their knowledge. Finding the right selection and implementation of studying habits can result in a more effective and efficient mastery of new knowledge that allows students to work more easily and better and improve adaptation both to changes resulting from the pandemic and to more general changes.

According to Loveless (2021), some students can get through school with minimal effort while others cannot. Successful students achieve their success by developing and applying effective studying habits. They schedule the times throughout the week when they are going to study and they stick to their schedule. Students who study occasionally usually do not perform as well as students with a plan and a schedule. Study time should become a part of students' daily routines. Compressing all of the study time into a few long days is not always working and is stressful. Time for studying should be every single day. Consistency and self-discipline are crucial. Developing good study habits will become a routine and help one maintain good performance throughout the study year. When scheduling study hours, students should choose blocks of time when they are at peak performance (Develop good habits, 2021). Some people work best in the mornings, others at night.

Taking breaks in between study sessions is very important. Prolonged studying is tiring. One cannot learn effectively when tired or under pressure. Taking breaks will refresh the brain and help absorb new information (Ho, 2020). White (2014) states that the 15-to-20-minute window is productivity's "golden hour". From our experience working with higher education students for over 20 years, we can say that studying for one hour and then taking a break helps students learn better.

Grohol (2016) says that many students make the mistake of studying in a place that is not conducive to concentrating. Students should choose an appropriate place to study where there are few distractions. Trying to study in a living room with a TV, a computer with games or even other people can be very difficult or even impossible.

Before we start studying, we need to ensure we have everything we need for work, from notebooks, books, pencils and calculators to drinking water, so we can study without unnecessary interruptions. Taking snack food and drinks to the study location will eliminate trips to the kitchen which break concentration (Chadron State College, 2021).

According to Zegarra (2019), it is essential to understand that there are many different learning styles and that each person will retain information better in different ways. Visual learners learn best from pictures, graphs and diagrams. They remember something by visualizing a picture of it in their mind. Auditory learners discover information by listening and interpreting information through pitch, emphasis and speed (Gilakjani, 2012). Kinesthetic learners learn through

physical activities. They use body, sense of touch and hands to learn. Logical learners need to use reasoning, logic and systems. Verbal learners favour using words and linguistic skills. Social learners like to learn with others or in groups (Zegarra, 2019). Solitary or intrapersonal learners prefer learning alone. It is essential to understand one's best learning style for successful learning. Working in groups enables students to get help from others, better and more quickly complete assignments, and teach others (Loveless, 2021). Some students prefer to practise by themselves. They practise by doing old exams and quizzes, depending on the course and availability (Grohol, 2016).

Another significant issue is taking good notes. These are beneficial and help to learn and remember important information. It is essential to understand not to take notes of everything, only of what is necessary. When teachers emphasize something, students should write it down (Develop good habits, 2021). A note-taking style might also depend on the learning style described above. For example, if someone is more of a visual learner, drawing diagrams in notes will help remember what is essential. But taking notes is not enough: revising them along with other class material is necessary. Successful students revise what they have learned. A well-known revision cycle is to revise shortly after the material was first presented and studied, then again the following week, the following month and six months on. The process of repetition does not have to be very long, and one does not have to repeat everything, only key points and keywords. If you do not revise, you can forget 80% of what you have learned in a few weeks. Frequent revision throughout the course will pay off during exams and ease pre-exam anxiety (Chadron State College, 2021).

Loveless (2021) states that simply learning without direction is not effective: students must know what they need to accomplish during each learning session. So before starting, a learning session goal that supports the overall academic goal needs to be set.

Enough quality sleep and food are essential studying habits that most learners do not manage properly – getting a good night's sleep and eating healthily influence the learning process. Students who consume unhealthy food, do not drink enough water and have little quality sleep will find it hard to retain information (Ho, 2020). In other words we must bear in mind that healthy living habits have a significant impact on learning abilities.

But there is one other component needed for successful study: taking responsibility for studying. According to Miller (2010), taking responsibility makes a lot possible in our lives. Taking responsibility for education means taking responsibility for homework, academic choices, seeking support if needed, attitude (believing in ourselves, being willing to learn), interactions with others, confidence and growth. If one works hard to learn effectively, the improved skills will soon become a habit and result in higher grades, knowledge, wisdom and confidence.

Method

Sample

The study sample consisted of 272 students from the University of Maribor, Slovenia. Of the 272, 35.8% were male and 64.2% were female; 81.6% were undergraduate and 18.4% postgraduate students; 74.6% were regular and 25.4% part-time students. Social science students accounted for 70.2% of the sample and the natural and technical sciences students for 29.8%.

Questionnaire and Procedure

The questionnaire contained closed questions referring to (i) general data (gender, level of study, mode of study and field of study), (ii) studying habits, and (iii) advantages and barriers of distance learning. The studying habits module was divided into four sub-modules: studying time (7 items), studying space (6 items), mode of studying (26 items) and learning during lectures (5 items). In addition, we included four items related to social elements. All 48 items were measured on a 5-point Likert-type frequency scale. Students were asked to choose from "1=Never", "2=Rarely", "3=Sometimes", "4=Often" and "5=Always" separately for the time before the pandemic and for the period of the pandemic. In addition, students were asked to indicate their average studying time per day.

Advantages and barriers of distance learning during the pandemic were studied using 19 items. Students were asked to indicate the level of agreement on a 5-point Likert-type scale from "1=I do not agree at all" to "5=I agree completely".

The online questionnaire was presented to students by professors during lectures and tutorials. Participation in this research was voluntary. The study was reviewed and approved by the ethics committee at the Faculty of Organizational Sciences, University of Maribor.

All statistical tests were performed with SPSS. Parametric tests (One – Samples *t*-Test, Paired – Samples *t*-Test, Paired – Samples Proportions Test, and Independent – Samples *t*-Test) were selected for normal and near-normal distributions of the responses.

Results

To determine to what extent and how the COVID-19 pandemic affected students' studying habits, means and standard deviation values for each of the 48 items in (ii) and overall of the sub-modules were calculated and then compared using a one-tailed Paired – Samples t-Test. Statistically significant differences were confirmed for *studying space* items and for *learning during lectures* items. Detailed results are given in Tables 1 to 5.

Statistically significant differences in the *studying time* sub-module were revealed for items 3, 4, 5 and 6 (see Table 1). Specifically, the test results showed that students studied on average more often in the morning and at night before the

pandemic than during it pandemic, while during the pandemic students studied on average more often in the afternoon and evening than before it.

Table 1. Descriptive Statistics for Studying Time Items and Results for t-Test

		Before Pandemic		**During Pandemic**			
	Studying time	**Mean**	**SD**	**Mean**	**SD**	***p***	
1	I prepare a studying schedule (plan for a week or a month).	2.91	1.379	2.98	1.464	0.143	
2	I study all the time.	2.87	1.213	2.97	1.265	0.079	
3	I study in the morning.	**2.96**	1.256	2.77	1.312	0.000	**
4	I study in the afternoon.	2.91	1.103	**3.36**	1.196	0.014	*
5	I study in the evening.	2.87	1.328	**3.15**	1.359	0.036	*
6	I study at night.	**2.40**	1.458	2.13	1.410	0.015	*
7	I study structured with breaks (e.g., 1 hour of studying, 15 minutes of rest).	3.50	1.272	3.00	1.345	0.191	
	Overall	2.87	0.593	2.91	0.696	0.117	

*: $p<0.05$; **: $p<0.01$

Statistically significant differences in the *studying space* sub-module were revealed for items 1, 2, 3 and 5 (see Table 2). Due to restrictions on movement and socializing during the pandemic, it is not surprising that students studied more often in the library or with classmates before the pandemic and more often at home, usually in the same room, during the pandemic.

Table 2. Descriptive *Statistics for Studying Space Items and Results for t-Test*

		Before Pandemic		**During Pandemic**			
	Studying space	**Mean**	**SD**	**Mean**	**SD**	***p***	
1	I study in a library.	**1.54**	0.948	1.11	0.491	.000	**
2	I study at home.	4.72	0.539	**4.80**	0.583	.013	*
3	I study at my classmate's place.	**1.68**	1.008	1.34	0.814	.000	**
4	The presence of others bothers me.	3.47	1.388	3.50	1.409	.208	
5	I always study in the same room.	3.78	1.143	**3.93**	1.096	.002	**
6	Before studying, I make sure that there are no disturbances (TV, telephone, etc.).	3.44	1.267	3.40	1.334	.221	
	Overall	**3.10**	0.527	3.01	0.515	.000	**

*: $p<0.05$; **: $p<0.01$

Statistically significant differences in the *mode of studying* sub-module were revealed for items 3, 4, 12, 13, 15, 16, 17, 25 and 26 (see Table 3). Studying in pairs or groups was more common before the pandemic. Monitoring students via video surveillance, especially if there are several students in a group, is very challenging, and there may be several options for using illicit devices like smartwatches, smartphones, magic calculators, live stream wifi glasses and others during exams. As the test results showed, during the pandemic, students used such devices more often than before. During distance education, students received a lot of e-material, which they studied directly via computer, whereas before the

pandemic, they had preferred to learn from printed notes or books and they more often learned from other students' notes. While students did not often ask others to test their knowledge before the pandemic, they did so even less during it. It is also crucial to note that students found it harder to start studying and stay focused during the pandemic.

Table 3. Descriptive Statistics for the Mode of Studying Items and Results for t-Test

		Before Pandemic		**During Pandemic**			
	Mode of studying	**Mean**	**SD**	**Mean**	**SD**	***p***	
1	I prepare carefully for studying (I take care of everything I need).	3.92	0.950	3.96	1.068	0.209	
2	I study alone.	4.53	0.711	4.57	0.784	0.191	
3	I study in pairs.	**1.92**	1.053	1.74	0.986	0.000	**
4	I study in a group.	**1.64**	0.871	1.48	0.822	0.002	**
5	I study with the help of mind maps.	2.26	1.215	2.20	1.244	0.093	
6	I study from the exams/tests.	3.28	1.227	3.24	1.310	0.232	
7	I study by completing tasks.	3.74	1.063	3.76	1.095	0.357	
8	I study by heart.	2.93	1.072	2.87	1.100	0.105	
9	I ask my classmates about unclear notions or terms.	3.42	1.165	3.35	1.198	0.097	
10	I find an explanation for unclear terms by myself.	4.01	0.860	4.05	0.917	0.159	
11	I ask the teacher about unclear notions or terms.	2.59	1.171	2.51	1.222	0.076	
12	I am using cheat sheets or other illicit devices (smart devices etc.) for exams.	1.50	0.840	**1.65**	0.903	0.001	**
13	I study from a book.	**3.04**	1.131	2.90	1.208	0.010	*
14	I study from my notes.	4.26	0.920	4.23	1.014	0.246	
15	I study from other students' notes.	**2.58**	1.251	2.43	1.259	0.002	**
16	I read the notes in e-format directly from my computer.	2.37	1.207	**2.82**	1.417	0.000	**
17	I study more easily from printed material than from a computer.	**4.30**	1.014	4.21	1.139	0.030	*
18	Before I finish studying, I ask someone to test me.	**1.84**	1.131	1.70	1.027	0.002	**
19	I find it challenging to connect theory with practical examples.	2.27	1.050	2.29	1.073	0.246	
20	I help myself with examples of other seminar assignments.	3.07	1.216	3.08	1.280	0.403	
21	I connect the learning material with other knowledge (also with other subjects etc.).	3.63	0.979	3.64	1.038	0.365	
22	I need help or instructions.	1.68	0.923	1.70	0.964	0.357	
23	I learn with pleasure.	3.05	1.116	2.99	1.192	0.128	
24	I revise the studyed material.	3.41	1.063	3.39	1.096	0.371	
25	I find it hard to start studying.	3.25	1.160	**3.42**	1.233	0.006	**
26	I find it challenging to stay focused – while studying, my thoughts tend to wander.	3.13	1.092	**3.34**	1.165	0.001	**
	Overall	2.99	0.329	2.98	0.377	0.427	

*: $p<0.05$; **: $p<0.01$

Re-designing the educational process from face-to-face to distance learning resulted in different patterns of student behaviour during lectures. This was confirmed by statistically significant differences for all *learning during lectures* items (see Table 4). Before the pandemic, students took notes more often, memorized more during lectures and participated in discussions more often.

Classes seemed less interesting to them during the pandemic, but they also estimate that they learned more by writing seminar papers.

Table 4. Descriptive Statistics for Learning During Lectures Items and Results for t-Test

		Before Pandemic		**During Pandemic**			
	Learning during lectures	**Mean**	**SD**	**Mean**	**SD**	***p***	
1	I take notes during lectures.	**4.01**	1.071	3.58	1.241	0.000	**
2	I remember a lot from the lectures.	**3.82**	0.894	3.53	1.017	0.000	**
3	I get bored during lectures.	2.63	0.945	**2.97**	1.026	0.000	**
4	I learn a lot by participating in discussions.	**3.64**	1.063	3.45	1.182	0.000	**
5	I learn a lot by writing seminar papers.	3.27	1.156	**3.40**	1.210	0.002	**
	Overall	**3.48**	0.534	3.38	0.572	0.002	**

*: $p<0.05$; **: $p<0.01$

Statistically significant differences in the *social elements* sub-module were revealed for items 1 and 2 (see Table 5). During the pandemic, fewer jobs were available for students. This could be one of the reasons why students devoted less time to student emplyment during the pandemic and more time to sleep compared to the time before the pandemic, as the test results show.

Table 5. Descriptive Statistics for Social Elements Items and Results for t-Test

		Before Pandemic		**During Pandemic**			
	Social elements	**Mean**	**SD**	**Mean**	**SD**	***p***	
1	I also have a full or part-time job while at university.	**3.45**	1.534	3.19	1.681	0.004	**
2	I get enough sleep.	3.44	1.162	**3.70**	1.107	0.000	**
3	I have healthy eating habits.	3.56	1.059	3.63	1.145	0.159	
4	The course is a big responsibility for me.	4.19	0.837	4.22	0.926	0.177	
	Overall	3.66	0.700	3.68	0.752	0.282	

*: $p<0.05$; **: $p<0.01$

In addition to studying habits, we were also interested whether there were changes in studying time. Students indicated how much time, on average per day, they studied before and during the pandemic. The results are presented in Table 6.

Table 6. Descriptive Statistics of Studying Time Items and Results for Proportions Test

Studying time	**Before pandemic**	**During pandemic**	***p***	
Up to two hours	69.9 %	65.5 %	0.086	
Two to four hours	25.8 %	26.8 %	0.407	
More than four hours	4.2 %	**7.7 %**	0.030	*

*: $p<0.05$; **: $p<0.01$

Sample results show that the proportion of students with longer studying times was higher during the pandemic. Using the one-tailed Paired–Samples Proportions

Test, it was confirmed that the proportion of students who studied for more than four hours per day on average was statistically significantly higher than before the pandemic.

To identify advantages and barriers that distance learning has introduced during the pandemic and how these affect students' studying habits, we inferred from responses to the 19 elements listed in Table 7. Students were asked to indicate the level of agreement on a 5-point Likert-type scale from "1=I do not agree at all" to "5=I agree completely". Mean values of responses with standard deviations are also given in Table 7.

Table 7. Descriptive Statistics of During-the-Pandemic Items

	Advantages and barriers of distance learning	**Mean**	**SD**
1	During the pandemic, my motivation to study has dropped.	2.85	1.318
2	During the pandemic, I have spent more time studying.	2.96	1.192
3	During the pandemic, I have needed assistance more often.	2.37	1.098
4	Studying has seemed much more difficult to me during the pandemic.	2.67	1.291
5	During the pandemic, I have been under more stress due to my studying.	2.71	1.266
6	During the pandemic, my communication with classmates has declined.	3.64	1.270
7	During the pandemic, my collaboration with classmates has declined.	3.48	1.309
8	The pandemic has drastically changed my studying habits.	3.09	1.229
9	Due to the pandemic, I have not had a suitable studying environment/space.	2.15	1.115
10	The pandemic has increased my digital literacy (the ability to find, evaluate and compile clear information through the use of computer programs and tools).	3.59	1.111
11	Due to the pandemic, I have lowered my learning goals.	2.10	1.111
12	I have not had the appropriate ICT equipment to study during the pandemic.	**1.85**	0.944
13	I have not had a suitable internet connection to study during the pandemic.	1.98	1.026
14	Teachers have been less accessible during the pandemic.	2.12	0.932
15	Teachers have been less interested in teaching during the pandemic.	2.13	0.974
16	Assessment of knowledge during the pandemic has not been appropriate.	2.27	1.054
17	Due to the pandemic, I have had difficulty accessing learning material.	2.75	1.164
18	I prefer distance learning to traditional learning.	3.16	1.410
19	Distance learning gives me more flexibility.	**3.93**	1.201

The item with the highest mean value (3.93) was item 19, "Distance learning gives me more flexibility." This was also the only item for which the one-tailed One–Samples t-Test confirmed an average agreement score statistically significantly higher than 3.5 (t=5.156, p=0.000), which confirms that distance learning for students represents a more flexible form of study compared to the classical one. The item with the lowest mean value (1.85) was item 12, "I have not had the appropriate ICT equipment to study during the pandemic." The one-tailed One–Samples t-Test confirmed that students on average disagree with statements 3 (t=2.368, p=0.042), 9 (t=1.148, p=0.000), 11 (t=2.100, p=0.000), 12 (t=1.851, p=0.000), 13 (t=1.981, p=0.000), 14 (t=1.124, p=0.000), 15 (t=2.129, p=0.000) and 16 (t=2.268, p=0.001), as the average agreement score is statistically significantly lower than 2.5.

A one-tailed Independent Samples t-Test was used to study the differences in the presented items according to gender (male, female), level of study (undergraduate,

postgraduate), type of study programme (regular, part-time), and field of study (social sciences, natural and technical sciences).

In studying gender differences, a significant difference was found for item 6, "During the pandemic, my communication with classmates has declined." The average agreement score for male students was found to be higher than that for female students (t=2.143, p=0.017).

When comparing student responses by the level of study, differences were confirmed for items 1, "During the pandemic, my motivation to study has dropped." (t=3.333, p=0.001), and 15, "Teachers have been less interested in teaching during the pandemic." (t=2.491, p=0.007). For both items, undergraduate students' average agreement score was higher than that of postgraduate students.

Analysis for the type of study programme showed significant differences for items 1, "During the pandemic, my motivation to study has dropped." (t=3.746, p=0.000), 7, "During the pandemic, my collaboration with classmates has declined." (t=2.096, p=0.019), and 8, "The pandemic has drastically changed my studying habits." (t=3.195, p=0.001). For all these items, the average agreement score for regular students was found to be higher than for part-time students.

In terms of field of study, the average level of agreement proved to be significantly different in more than half of the items when comparing groups of students. For all the following items listed below, the average agreement score for students of natural and technical sciences was found to be higher than that for social sciences students: 1, "During the pandemic, my motivation to study has dropped." (t=1.671, p=0.048), 2, "During the pandemic, I have spent more time studying." (t=1.836, p=0.034), 3, "During the pandemic, I have needed assistance more often." (t=2.441, p=0.008), 4, "Studying has seemed much more difficult to me during the pandemic." (t=2.001, p=0.023), 8, "The pandemic has drastically changed my studying habits." (t=1.706, p=0.045), 9, "Due to the pandemic, I have not had a suitable studying environment/space." (t=2.018, p=0.022), 11, "Due to the pandemic, I have lowered my learning goals." (t=1.907, p=0.030), 12, "I have not had the appropriate ICT equipment to study during the pandemic." (t=1.890, p=0.030), 14, "Teachers have been less accessible during the pandemic." (t=2.281, p=0.012), and 16, "Assessment of knowledge during the pandemic has not been appropriate." (t=2.677, p=0.004).

As the analysis of students' studying habits showed that during the pandemic they have found it harder to start studying and to concentrate, they got bored during lectures, and used illicit devices for exams, we also checked whether this was due to specific barriers of distance learning (16 items were selected from Table 7). For this purpose, Pearson Correlation analysis was used. The results are presented in Table 8.

Table 8. Correlation Analysis Results

Correlations	**I am using cheat sheets or other illicit devices (smart devices etc.) for exams.**	**I find it hard to start studying.**	**I find it challenging to stay focused – while studying, my thoughts tend to wander.**	**I get bored during lectures.**
During the pandemic, my motivation to study has declined.	0.243**	0.431**	0.383**	0.444**
During the pandemic, I have spent more time studying.	-0.131*	0.104	0.103	0.085
During the pandemic, I have needed assistance more often.	0.059	0.207**	0.219**	0.163**
Studying has seemed much more difficult to me during the pandemic.	0.020	0.240**	0.229**	0.181**
During the pandemic, I have been under more stress due to my study.	0.027	0.271**	0.288**	0.138*
During the pandemic, my communication with classmates has declined.	-0.024	0.105	0.119*	0.077
During the pandemic, my collaboration with classmates has declined.	0.001	0.154*	0.120*	0.085
The pandemic has drastically changed my studying habits.	0.032	0.099	0.144*	0.209**
Due to the pandemic, I have not had a suitable studying environment/space.	0.046	0.116*	0.153*	0.151*
Due to the pandemic, I have lowered my learning goals.	0.130*	0.226**	0.222**	0.259**
I have not had the appropriate ICT equipment to study during the pandemic.	0.006	0.015	0.091	0.125*
I have not had a suitable internet connection to study during the pandemic.	0.056	0.138*	0.187**	0.224**
Teachers have been less accessible during the pandemic.	0.125*	0.037	-0.009	0.310**
Teachers have been less interested in teaching during the pandemic.	0.256**	0.111	0.087	0.373**
Assessment of knowledge during the pandemic has not been appropriate.	0.105	0.165**	0.104	0.371**
Due to the pandemic, I have had difficulty accessing learning material.	0.040	0.115	0.148*	0.220**

*: $p<0.05$; **: $p<0.01$

Discussion

The COVID-19 pandemic has caused many changes in education. In this research, we tried to determine whether the changed modes of studying have also caused changes in the studying habits of higher education students. We found that the modes of studying have indeed had an impact and changed certain studying

habits of students, but not all of them. Changes in studying time, i.e., when students study (morning, afternoon, evening or night) were noticed. Before the pandemic, students studied more in the morning and at night, while during the pandemic, they have tended to study more in the afternoon and evening. This could be related to the restricted movement and prohibition of specific activities and socializing and the decline in student employment during the pandemic. Instead of going out with friends, doing sports activities, or working in the afternoon and evening, students could study. We did not detect changes in the duration of studying, except for those studying for four or more hours a day. The proportion of students with longer studying time during the pandemic was higher. Although Li and Lalani (2020) state that some research shows that students can learn faster online and that e-learning requires 40–60% less time to learn than a traditional classroom setting, we did not identify a shorter duration of studying. There were no differences in preparing the schedule or curriculum or studying breaks. Those who carefully planned before the pandemic and took breaks continued to do so during the pandemic. Students stated that they had no problems organizing studying time and combining it with other responsibilities. For some, it was even easier.

As expected, students studied more often in the library or with classmates before the pandemic and more often at home, usually in the same room, during the pandemic. In Slovenia, libraries were closed for a few months, and socializing outside the household was not permitted. We think these are the main reasons for students staying and studying at home. However, there were no changes detected regarding distractions during study. Those who could provide a learning environment free from distractions (telephone, television, radio, etc.) before the pandemic also maintained this during it.

Students who already studyed from exam assignments before the pandemic also did so during it. They also asked classmates or teachers for clarifications to the same extent as before. So despite stating that communication and collaboration with classmates had diminished, they remained connected and helped each other in cases of unclarity. It turned out that before the pandemic, they had studied primarily from classical textbooks and used other students' notes, while during the pandemic they studied more from e-materials, despite stating that they found it easier to learn from printed than from electronic sources. In many cases, they had no choice but to study from electronic sources, either because of the movement restriction and inability to access written material or because they did not have printers and could not print notes.

It turned out that the students did not have any problems in combining theoretical and practical knowledge or with connecting the learning material with other knowledge (also with other subjects etc.) as a result of the new mode of studying. But it was harder for them to start studying during the pandemic, they had problems staying focused and their thoughts tended to wander. This can be related not only to a decline in motivation, but also to the pandemic situation itself. Pudelko (2020) says that research in cognitive sciences today confirms what we know intuitively: learning requires attention, time and mind availability. We are paying attention to emotionally charged information. Not surprisingly, then, in a

context full of messages about the dangers of the pandemic, students find it difficult to focus sustainably on their studies.

We did not find any statistically essential differences related to stress due to study before and during the pandemic. Some students stated that distance learning is more suitable for them because there is no contact with people, which otherwise causes them the most stress. On the other hand, Kapasia et al. (2020) found that students have faced stress, depression and anxiety during the pandemic that has affected their learning.

Our research showed that students who had difficulties studying and staying focused lowered their learning goals and have not had a suitable studying environment/space during the pandemic. We also found that students who have needed a little more help/instructions during the pandemic have had difficulties staying focused and were bored during lectures.

In addition, we found a slight increase in the use of cheat sheets and other illicit devices (smartdevices etc.) during exams during the pandemic. We might attribute this to the more complex control of cheating in remote knowledge testing and students finding it easier to cheat. Reedy, Pfitzner, Rook, and Ellis (2021) also discovered that some students perceived cheating to be easier in online exams. But we also associated this factor with a decline in motivation and students lowering their learning goals. The research also connects the increased use of illicit devices with students' opinions that teachers have been less accessible and less interested in teaching during the pandemic. We think that all these factors encouraged students to use illicit devices during exams.

We were surprised that students took notes to a greater extent before the pandemic than during it. It also turned out that they remembered more from the lectures before the pandemic. It seems that students perceive the teacher and the courses differently live than over the net and therefore retain more. As already mentioned, students have been more bored during lectures during the pandemic than they were before it. That explains why they learned less by participating in discussions and more by writing seminar papers. Chakraborty et al. (2021) also found that students feel that they can interact better with professors in a physical classroom. As with some other factors, the increase in boredom during lectures was also associated with decreased motivation. The research showed that increased boredom during classes is associated with students lowering their learning goals and the opinion that teachers are less accessible during the pandemic and less interested in teaching. Higher boredom was also related to students' view that assessment of knowledge during the pandemic has not been appropriate and difficulties with accessing learning material. Kundu and Bej (2021) also found that many students were critical of the online multiple-choice question and the effectiveness of this type of examination.

As already mentioned, student employment turned out to have declined during the pandemic. Students were more likely to report getting enough sleep during the pandemic than before, which may also be related to the decline in student employment. Other studies also reported that students had extended their sleep time during the pandemic. Wright et al. (2020) found that students increased their sleep duration by 30 minutes during weekdays and 24 minutes at weekends.

The percentage of those who had seven or more hours' sleep per night increased from 84% to 92%. Blume, Schmidt, and Cajochen (2020), meanwhile, found that sleep duration had increased by 13 minutes.

Eating habits did not change during the pandemic, nor did the attitude towards study. Those for whom study represented a great responsibility before the pandemic said that it also did during it. The pandemic also did not affect regular revising of course material or learning pleasure.

We found that specific changes in studying habits are mostly not related to inadequate ICT equipment, poor internet connection, reduced communication with classmates or reduced collaboration with classmates. But we identified some changes related to less accessibility of teachers and students' perception that teachers are less interested in teaching. Some students stated that they have had problems with more demanding material in school because communication with professors is more complicated.

The study showed that online learning for students represents a more flexible learning form than the traditional one. Despite the decline in student employment, some students stated that the greater flexibility due to distance learning has allowed them to work regularly. Many stated that they have gained time for learning because they do not have to commute to lectures. They say the pandemic has even made their courses more accessible. Several other researchers also found that the main advantage of online learning was its flexibility. Gherhes, Stoian, Farcasiu, and Stanici (2021) found that the surveyed students considered the main benefits of online learning during the pandemic: flexibility of working time, the comfort of working from home and the variety of documentation sources, while Muthuprasad, Aiswarya, Aditya, and Girish's (2021) results indicate that flexible schedules and convenience are the major benefits of online learning. Online education offers students the opportunity to study at their own pace and at a time of their convenience. Hence flexibility and convenience are significant drivers behind the demand for online education.

Conclusion

The study found that the pandemic has caused specific changes in students' studying habits, especially in terms of when and where they study, with whom they study, how they take notes during lectures, how they participate in discussions, and how much sleep they get. However, it has not affected the preparation for learning itself, cooperation in cases of uncertainty, learning sources or the need for additional help.

More than study habits, the new mode of working has affected the well-being of students. They largely missed socializing with classmates and contact with their teachers. Some stated that they were lazy at first but got back into a routine quickly and got used to it and that they would even have a problem going back to the faculty again. Many believe that distance learning should be introduced as a permanent mode of learning or at least allow a choice between traditional and online learning. For some, online learning is very convenient, and some even do

not wish to return to the traditional classroom. They state that online learning is better in terms of time and finances and is more comfortable and that such learning does not seem more difficult.

Thus it would make sense in further research to examine what suits students in their study, what they like about online learning and what they miss to enrich the online learning experience. In all likelihood, future studies will need to be more tailored to the needs of the individual. From the students' answers here, it can be seen that online learning has proved to be much more suitable for some, while others wish to return to the traditional classroom and lecture hall. Some students state that it has been a positive experience for them and refer to there being no commutes to faculty, to the comfort of home, and to adequate toilet breaks and refreshments. One of them also stated that his grade point average had risen during the pandemic. As a negative experience, many students mention the lack of personal socializing with classmates, but this is not an especially worrying issue for others, because they are connected via Zoom and Messenger. One student also wrote that everything is good for something: you just have to look at the situation positively. Again others hope to get back to the faculty as soon as possible. Furthermore, the wishes and needs of individuals are also very different depending on the field of study. Therefore it would be reasonable to focus further research on the possibility of adapting courses to individual needs or individual students' studying habits not just during the pandemic.

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