UNIVERSITY OF LJUBLJANA

SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

THE IMPACT OF REMOTE TEACHING ON STUDENT LEARNING AND ENGAGEMENT AT THE UNIVERSITY OF LJUBLJANA

Ljubljana, September 2022   JOAN SABBADIN

AUTHORSHIP STATEMENT

The undersigned Joan Sabbadin, a student at the University of Ljubljana, School of Economics and Business, (hereafter: SEB LU), author of this written final work of studies with the title *The Impact of Remote Teaching on Student Learning And Engagement at the University of Ljubljana*, prepared under supervision of assoc. prof. Tamara Pavasović Trošt, PhD.

DECLARE

1. this written final work of studies to be based on the results of my own research;

2. the printed form of this written final work of studies to be identical to its electronic form;

3. the text of this written final work of studies to be language-edited and technically in adherence with the SEB LU's Technical Guidelines for Written Works, which means that I cited and / or quoted works and opinions of other authors in this written final work of studies in accordance with the SEB LU's Technical Guidelines for Written Works;

4. to be aware of the fact that plagiarism (in written or graphical form) is a criminal offence and can be prosecuted in accordance with the Criminal Code of the Republic of Slovenia;

5. to be aware of the consequences a proven plagiarism charge based on the this written final work could have for my status at the SEB LU in accordance with the relevant SEB LU Rules;

6. to have obtained all the necessary permits to use the data and works of other authors which are (in written or graphical form) referred to in this written final work of studies and to have clearly marked them;

7. to have acted in accordance with ethical principles during the preparation of this written final work of studies and to have, where necessary, obtained permission of the Ethics Committee;

8. my consent to use the electronic form of this written final work of studies for the detection of content similarity with other written works, using similarity detection software that is connected with the SEB LU Study Information System;

9. to transfer to the University of Ljubljana free of charge, non-exclusively, geographically and time-wise unlimited the right of saving this written final work of studies in the electronic form, the right of its reproduction, as well as the right of making this written final work of studies available to the public on the World Wide Web via the Repository of the University of Ljubljana;

10. my consent to publication of my personal data that are included in this written final work of studies and in this declaration, when this written final work of studies is published.

Ljubljana, _____   Author's signature: _____

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ATUS - American Time Use Survey
MOOC - Massive open online Course
OECD - The Organisation for Economic Co-operation and Development
OU – Open University
PLATO - Programmable Logic for Automatic Learning Operations
PTSD - Post-traumatic stress disorder
UL – University of Ljubljana / Univerza v Ljubljani

INTRODUCTION

Since the official declaration on March 12th of the Covid-19 pandemic in Slovenia (Urad vlade za komuniciranje, 2020) the main objective of all universities in Slovenia was to find a remote solution to continue the educational process avoiding negative impacts on knowledge acquisition. Institutions were forced to become smarter and switch to remote in order to secure the safety of employees and students (Vollbrecht, Porter-Stransky & Lackey-Cornelison, 2020). In the very first weeks of the pandemic educational leaders spent most of their efforts finding a suitable solution to replace in-class teaching. Professors, as well as students, found themselves in a completely new scenario where previous teaching models were not feasible because of the group gathering restrictions (Townsley, 2020).

In a couple of days, all courses had to transit from in-class to remote. Switching courses to an online mode generally requires a specific educational plan, audio and video materials, technology, and technological support, and because of the sudden transition, many professors found themselves lacking the required preparation, remote teaching experience, and technical support (Bao, 2020). In addition, teaching remotely exposed new challenges for faculties since different techniques are required to stimulate students' active learning outside of classrooms (Bao, 2020), and the role expected from the faculty when teaching remotely is significantly different than teaching in person (Berge, 2008). At the same time, both professors and students found themselves in a situation of poor conditions and constant interruptions, such as taking care of their children or younger siblings (Townsley, 2020).

Even before the pandemic, some believed that education had to be reinvented and reformed completely (Bartlett & Schugurensky, 2020), and research on remote learning was already taking place, due to the increase in home-schooled children (in elementary school) and online schooling (for university students), which sharply increased post-2000 (Bartlett & Schugurensky, 2020). But during the pandemic, we have witnessed an extraordinary change. That did not occur because of the evolving technology that is allowing new teaching methods or the simple belief that in-class or face-to-face education has become obsolete, but because of an unexpected global pandemic. Furthermore, this sudden change was not expected so what education was trying to recreate in the first phase is the in-class experience using variations of already existing options such as remote learning, homeschooling, micro-schooling, and unschooling (Bartlett & Schugurensky, 2020). And the institution has continued to remain the epicenter of education, just as it was during in-class (Bartlett & Schugurensky, 2020). Materials, content, supervision, and grading were still all provided by the institution, just the physical presence was not required anymore. And remote learning as such is not a big innovation or reformation since it is not introducing any real innovation to what in-class schooling offered and represented (Bartlett & Schugurensky, 2020).

Since the pandemic outbreak, a large body of research has focused on the possible effects of switching to remote learning. On one hand, benefits like flexibility, improved productivity, greater autonomy, and better continuity, but on the other downsides like social networks, communication, motivation, increased cheating, technical infrastructure, insufficient technological knowledge, disturbing learning environments, and zoom fatigue have been stressed. For instance, Saikat, Dhillon, Wan Ahmad & Jamaluddin (2021) reviewed the positive and negative effects of remote learning. According to their research, remote learning has importantly impacted the education sector by allowing learners to continue their educational path online and reducing the spread of the coronavirus, however as already mentioned above, it also introduced new challenges that cannot be disregarded. Nevertheless, Saikat, Dhillon, Wan Ahmad & Jamaluddin (2021) believe that educational institutions should continue devising appropriate ways to improve remote learning instead of proceeding using traditional methods. The effect of remote learning has been discussed in detail in numerous works of contemporary authors, which include Wei Bao, Igor Chirikov, Krista M. Soria, Bonnie Horgos, Daniel Jones-White, Sir John Daniel, Mohammad H. Rajab, Abdalla M. Gazal, Khaled Alkattan, Shahnawaz Saikat, Jaspaljeet Singh Dhillon, Wan Fatimah Wan Ahmad and Robiatul A'dawiah Jamaluddin.

A large portion of Slovenian youth between 18 and 27 is enrolled in a tertiary education program, which stresses the importance of studies on this population. There were officially 37,615, of which 3,094 were foreign students studying at the UL (University of Ljubljana hereinafter UL) in the school year 2019/2020 (Univerza v Ljubljani, no date a), all of whom had to switch to remote schooling for a large part of two academic years. Even though the major lockdowns because of the coronavirus are probably behind us, the need to understand remote learning is still very important. According to Chatti, Jarke & Frosch-Wilke (2007), modern times require different knowledge and therefore also new learning methods. "Learning is fundamentally personal, social, distributed, ubiquitous, flexible, dynamic, and complex in nature. Thus, a fundamental shift is needed toward a more personalized, social, open, dynamic, emergent and knowledge-pull model for learning, as opposed to the one-size-fits-all, centralized, static, top-down, and knowledge-push models of traditional learning solutions" (Chatti, Agustiawan, Jarke & Specht, 2010, p. 66–67). Thus, the primary argument that is made is that we need a better understanding of how remote teaching works and how it affects students so that it can be improved, and potential obstacles and pitfalls can be avoided.

The purpose of this thesis is to provide an insight into the sudden change to remote and its effects on time management, engagement, and learning process of students enrolled at the UL. Since the switch to remote happened during the Covid-19 pandemic and it had an enormous impact on students' general well-being and education, it was included in the thesis as a driving force behind the switch to remote. This thesis helps to understand the impact of remote learning during the Covid-19 pandemic on performance, effectiveness, and

knowledge acquisition and provides faculties, professors, and students with insights on the most problematic areas and ways to improve them.

The goals of the thesis are:

- To review the literature on the effects of remote learning and Covid-19 on tertiary education;
- To determine the main challenges of students in tertiary education and how it applies to the current pandemic and remote teaching situation;
- To determine the issues that are preventing students from a successful transition to remote;
- To measure the attitudes of Slovenian students toward remote learning;
- To measure the effects of remote learning and Covid-19 on the learning and engagement of Slovenian students;
- To provide recommendations for future improvements in remote teaching and after Covid-19 conditions.

The thesis relies on both secondary and primary data. To understand the effects of remote learning on tertiary education, remote productivity factors and build the fundamental theoretical framework, secondary sources like scientific papers and articles were used. An empirical study based on the collection of primary data via a survey questionnaire was carried out with 223 individuals in order to measure attitudes of Slovenian students towards remote learning.

In the first chapter of the thesis, I present the evolution of remote education and several foreign studies that serve as a theoretical foundation. In the second, I examine the main challenges in remote and the impact of Covid-19 on students, taking into consideration also socioeconomic factors. The benefits of remote learning are covered in the third chapter. The fourth and fifth parts are a presentation of the research methodology and the main findings as well as a short description of the research limitations with some avenues for future research, followed by the conclusion.

1 REMOTE EDUCATION

With technological advancement and the development of information and communication technologies, our professional and private lives have changed. It changed our social relationships, learning networks, educational processes, routines, and the abundance of information, methods, and possibilities led to learners becoming increasingly demanding (Sezgin, 2020). In response to the increasing demand for customized learning, aesthetic and quality of materials as well as simplicity and accessibility, state but mostly private education has reacted (Sezgin, 2020). Since March 2020 the UL, like all the universities and many other institutions in Slovenia, was forced to switch to remote and implement emerging information and communication technologies.

1.1 Predecessors of remote learning

The concept of remote learning appears in the late twentieth century when businesses and institutions start to collaborate for educational purposes (Kanafina, 2022). Even though the internet was created only in 1969, in 1960 the University of Illinois created PLATO (Programmable Logic for Automatic Learning Operations hereinafter PLATO), which we today consider the archetype of remote learning (Kanafina, 2022). PLATO is a set of connected computer terminals that allowed students to access lecture information and materials in their free time (Kanafina, 2022). So in many college libraries, it became possible to access lecture content already by the mid-1980s (Kanafina, 2022).

1.1.1 The Open Universities

Over the past decade, more and more profit-driven colleges and universities have been established, focusing on business-related topics and issues (Tait, 2018b). But the sustainability and necessity of OUs (Open University hereinafter OU) have been questioned since their beginnings (Tait, 2018b).

Today we know that OUs can help extend the network of smaller institutions and democratize education. For instance, the biggest university in the world is the Indira Gandhi National Open University, which is with its 4 million enrolled students, the first university to reach such a large number of enrollments (IgnouHelp, 2021).

One of the biggest improvements of remote learning compared to traditional learning is the ability to share and the OU in Milton Keynes, United Kingdom, is the perfect example. They decided to take advantage of modern possibilities and introduce their students to modern and flexible learning. For instance, in Mallorca, Spain, at the Observatori Astronomic de Mallorca where circumstances on average for observational astronomy are far better than anywhere in the United Kingdom, the OU in Milton Keynes installed a semi-autonomous astronomical telescope that students can employ at any time (Hunter, 2019). Their goal is to

find other institutions with similar equipment in order to share and be less dependent on weather conditions and technical hitching (Hunter, 2019). But they also have in-house equipment like optical and electron microscopes which are accessible from anywhere in predefined slots of 5 to 50 minutes with 400 pre-prepared samples and can be used by up to 45 students simultaneously, which was impossible before (Hunter, 2019). By doing so, the OU in Milton Keynes is also allowing students and young researchers to work with the latest equipment rather than making them use obsolete ones.

1.1.2   Massive open online Courses

MOOCs (Massive online open course hereinafter MOOC) are educational platforms usually free or very affordable provided by foundations, universities, private companies, or combinations of those (Sezgin, 2020). Similar to what OUs are offering, MOOCs make education even more accessible and flexible by offering a bigger spectrum of opportunities such as short introductory courses to full degree modules, and allowing users to watch the courses and complete tests based on their schedule. The main purpose is to liberalize education and support lifelong learning, but also to provide certificates from accredited universities and renowned professors (Sezgin, 2020). Therefore, MOOCs have huge potential to remove barriers in education and are suitable for young students as well as elderly people (Sezgin, 2020).

Coursera for example is a global learning platform that partners with more than 200 leading universities around the globe (Coursera, no date). Founded in 2012 by Daphne Koller and Andrew Ng, Coursera is today one of the leading platforms providing affordable, flexible, and work-related courses (Coursera, no date). The company started without planning to offer degrees, but today in addition to short courses, job certificates, and hands-on projects, they also offer degree programs, and many are wondering if tertiary education will be influenced or even fundamentally revolutionized by the emerging innovative learning platforms.

The pros and cons of MOOCs such as Coursera, edX, and Udemy are very similar to those stressed by professors and students today in remote learning. Andrew Ng, co-founder and professor at Stanford University, after he taught 100,000 students on machine learning in one semester, he said for the New York time: "I normally teach 400 students, to reach that many students before, I would have had to teach my normal Stanford class for 250 years" (Friedman, 2012, p. 25). While remote learning is providing the same or similar content as before the pandemic but in a different setting, MOOC is opening elite education to the masses. Students, but not only, have now access to materials from great professors from exclusive universities.

If on the one hand, flexibility, availability, and quality content of MOOCs and OUs is a big advantage, on the other, tertiary education is much more than just knowledge acquisition and productivity. Education and maturation processes that come from campus life, collaborations, network, and ties creation with other peers are part of students' social

baggage that is also the result of in-class tertiary education (Adams, 2012). Another very big issue of MOOCs and OUs is cheating. Antonio Rangel, a Caltech professor, said when asked about MOOCs for tertiary purposes: "I would not want to give credit until somebody figures out how to solve the cheating problem and make sure that the right person, using the right materials, is taking the tests [...]" (Lewin, 2012, p. 12).

The same concern Antonio Rangel expressed for MOOCs, arose in remote learning during the pandemic. Many institutions have struggled to assess the work done remotely. Teachers and professors were requested to lower the standards and/or not to give failing grades which can result in students not doing their work and slacking off (Hobbs & Hawkins, 2020).

1.2   Insights gained from the literature on remote working

While the conditions and consequences of remote working have been studied extensively, the effects of remote working on students are relatively unstudied (Pretti, Etmanski & Durston, 2020). However, some insights can be gained from reviewing the literature on remote working.

Remote working was typically used as an incentive for employees. Especially for those, who have good individual skills and the technology required to maximize effectiveness. Disadvantages like loss of communication, decreased support, the need to be online, and the stress provided by continuous interruptions have been identified in online working professionals (Pretti, Etmanski & Durston, 2020). However, the most cited drawbacks for remote workers were the loss of weak social and professional ties and the feeling of being isolated (Pretti, Etmanski & Durston, 2020). Similar to what has been observed during the Covid-19 lockdowns and remote education (Long et al., 2022). According to research on telecommuting intensity, the more workers are working remotely, the stronger their relationship with the supervisor, but the weaker their relationships with co-workers (Pretti, Etmanski & Durston, 2020). But also, many benefits of remote working have been identified such as job satisfaction, flexibility, autonomy, productivity, and stress reduction (Pretti, Etmanski & Durston, 2020). Especially the flexibility of remote working is appreciated among remote workers and according to the remote workers, it helps to improve the work-life balance, meet family demands, and increase productivity (Pretti, Etmanski & Durston, 2020). However, when everything shifted to remote, everyone had to be constantly available (Nadler, 2020). It is undesirable, or even impossible, to be more than an hour away from e-mails and online meetings which is putting additional pressure on workers (Nadler, 2020). Even though this is a major concern for remote working professionals, it is very unlikely that students feel the pressure of constantly being available, on the contrary, the concern in education is that students' engagement decreases on remote and that some students might fall behind.

Research done on working students has shown that for most students the support from supervisors and co-workers, the similarity of their duties, and their initiative have helped

them during the transition to remote working (Pretti, Etmanski & Durston, 2020). Therefore, if it's easier for full-time employees to adjust to working remotely than it is for part-time student employees, it should have been easier for seniors to adjust to remote learning compared to freshmen.

Remote working was possible before the pandemic because of technological advances, but the reason behind this growing trend was cultural (Hunter, 2019). The flexibility of remote working was key for modern workers. In a survey of 10,000 people from the EU, UK, USA, Canada, and Australia done by Fuze, a communications service provider from Boston, USA, 89% of workers reported that remote working should be an option and 54% were ready to change their job to obtain a better work/life balance (Hunter, 2019).

Many academic workers stressed the importance of face-to-face interactions before starting a common work even before the pandemic (Hunter, 2019). Michael Spannowsky from the Institute for Particle Physics Phenomenology at the University of Durham, UK, believes remote collaborations work very well if an initial contact was established (Hunter, 2019). "To initiate a project I consider it essential to have met my collaborators, which usually takes place at workshops or conferences. At least for all the collaborations I have participated in, it is extremely rare to collaborate with somebody whom one does not know at all beforehand" he said (Hunter, 2019, p. 2). Deepak Kar from the University of Witwatersrand in Johannesburg, South Africa, agreed that "[…] humans work better when they feel it's a real person on the other side. Even in our 3,000 plus people ATLAS collaboration, I know a large number of people personally, and it is always more efficient and pleasant working with them remotely, compared to someone who I have never met" (Hunter, 2019, p. 2).

1.3   Insights from studies at foreign universities

In the USA, shortly after the switch to remote, learning has been labeled as a failure (Hobbs & Hawkins, 2020). The problems identified by Hobbs and Hawkins (2020) hindering a pleasant transition were very similar to those underlined in other studies. The most concerning points were two. One was that students simply didn't show up online and that institutions had no solution to find the reasons behind those absences and the second was that in some districts students were not required to do any work, leading to big gaps in educational levels (Hobbs & Hawkins, 2020).

Research done at the Alfaisal University in Riyadh, Saudi Arabia, between March and May 2020 has shown that 62.5% of students would rather blend online and in-class learning methods, while 25.5% would rather switch back to the usual face-to-face and only 12% prefer remote teaching (Rajab, Gazal & Alkattan, 2020). At Alfaisal University, many respondents suggested that the circumstances fabricated by the pandemic have shown the usefulness of remote learning and should be considered in the post-pandemic reforms (Rajab, Gazal & Alkattan, 2020). Interestingly, at Alfaisal University, 70.7% of the students were positively impressed by the effectiveness of remote learning (Rajab, Gazal & Alkattan,

2020). But the study was conducted at a private university where most of the students are from middle or upper socioeconomic classes. Even though the research has some limitations, it shows that wealthier students are accepting remote learning as a valid alternative and as a future improvement of the usual in-class teaching by combining in-class and remote learning. Regardless of socioeconomic status, there are students facing problems in the transition to remote. Surprisingly, the third most cited issue among students (56.5%) at the University in Riyadh was the use of technology tools (Rajab, Gazal & Alkattan, 2020). The most cited issue was communication with 59% of 208 students who responded to the survey (Rajab, Gazal & Alkattan, 2020). So even private universities and wealthier students are mostly facing similar issues to public universities and their enrolled students.

Research conducted in the Baltic countries on engineering students from the Latvia University of Life Sciences and Technologies, the Vytautas Magnus University, and the Estonian University of Life Sciences, has shown that students prefer studying face-to-face with a teacher compared to remote learning, studying in a group or individually.

As presented in Figure 1, in contrast to Estonian and Latvian, Lithuanian students like to study remotely (6.6%) slightly more than face-to-face with a teacher (6.3%). However, aggregated data shows us that nearly half of the respondents (46.9%) prefer studying face-to-face with a teacher.

Figure 1: Learning form preferences by country

Country	Others	Remote learning	I like to study face to face with a teacher	I prefer to study in a group	I prefer to study individually	Total
Estonia	2.2%	6.3%	21.0%	4.1%	0.4%	34.0%
Lithuania	1.5%	6.6%	6.3%	3.3%	3.0%	20.7%
Latvia	1.1%	11.1%	19.6%	8.9%	4.7%	45.3%
Total	4.8%	24.0%	46.9%	16.3%	8.1%	100.0%

Source: Vintere, Aruvee & Rimkuviene (2021).

In Figure 2, we can see students' assessments concerning their digital skills to use distance learning platforms and tools provided by teachers. There was a statistically significant difference in the responses. 75.9% of Lithuanian respondents rarely or never experienced problems with digital skills to use distance learning platforms/tools offered by the teacher which partly explains a wider acceptance of remote learning for Lithuanian students.

Figure 2: Answers to question: "Have you had problems with digital skills to use distance learning platforms/tools offered by teachers?"

Country	Answers			
	always	**often**	**rarely**	**never**
Chi-square = 38.39, p-value < 0.001				
Estonia (ET)	9.9%	29.7%	50.5%	9.9%
Lithuania (LT)	7.4%	16.7%	42.6%	33.3%
Latvia (LV)	21.5%	40.5%	29.8%	8.3%

Source: Vintere, Aruvee & Rimkuviene (2021).

Figure 3 shows additional challenges faced by Baltic students during remote learning and a comparison of the results between the observed countries. The problem of availability of information on e-learning opportunities/remote study process was the least stressed by Lithuanian students. Estonian students had the most difficulty with the volume of study while Latvian students encountered the most difficulty with the implementation of practical/laboratory work/practice and the problem to achieve the study results provided for in the study courses. For the analysis of the assessment of the problem of the availability of appropriate hardware/smart devices/software at home, there was no statistically significant difference. The problem of internet connection instability was mostly cited by Estonian and Latvian students while 70.4% of Lithuanian students cited that this problem occurred rarely or never.

Figure 3: Answers to question: "What problems you encountered in remote learning?"

Country	Answers			
	always	often	rarely	never
Availability of information on e-learning opportunities/remote study process				
Chi-square = 13.86 p-value = 0.031				
Estonia (ET)	11.0%	19.8%	46.2%	23.1%
Lithuania (LT)	5.6%	14.8%	57.4%	22.2%
Latvia (LV)	14.0%	32.2%	40.5%	13.2%
Volume of study works				
Chi-square = 28.32 p-value < 0.001				
Estonia (ET)	25.3%	46.2%	25.3%	3.3%
Lithuania (LT)	9.3%	37.0%	38.9%	14.8%
Latvia (LV)	9.9%	28.1%	46.3%	15.7%
Implementation of practical/laboratory work/practice				
Chi-square = 37.22 p-value < 0.001				
Estonia (ET)	8.8%	19.8%	44.0%	27.5%
Lithuania (LT)	7.4%	22.2%	37.0%	33.3%
Latvia (LV)	30.6%	33.1%	22.3%	14.0%
To achieve the study results provided for in the study courses				
Chi-square = 31.57 p-value < 0.001				
Estonia (ET)	6.6%	20.9%	45.1%	27.5%
Lithuania (LT)	7.4%	22.2%	38.9%	31.5%
Latvia (LV)	27.3%	31.4%	28.1%	13.2%
Availability of appropriate hardware/smart devices/software at home				
Chi-square = 7.58 p-value = 0.270				
Estonia (ET)	4.4%	20.9%	41.8%	33.0%
Lithuania (LT)	5.6%	20.4%	59.3%	14.8%
Latvia (LV)	5.8%	24.8%	45.5%	24.0%
Internet connection instability				
Chi-square = 17.36 p-value = 0.008				
Estonia (ET)	11.0%	39.6%	45.1%	4.4%
Lithuania (LT)	11.1%	18.5%	53.7%	16.7%
Latvia (LV)	10.7%	46.3%	33.1%	9.9%

Source: Vintere, Aruvee & Rimkuviene (2021).

1.4   Formal and informal learning

Learning, as well as communication in general, is not only about hearing. With the transition to remote learning, body language and facial expressions became very limited since those tools are not very effective through screens. In fact, students appear to have weak persistence and are more likely to skip class when learning online (Bao, 2020). The faculty has less control over the students in remote and therefore should use different techniques to stimulate their active learning outside of classrooms (Bao, 2020).

Technology also tricked us into thinking that time and spaces are not important during the learning process (Andrade & Du, 2007). This is mainly because of its availability. It is true that technology made learning very accessible and flexible, however, this is also the reason why it is significant when and where we are learning. Compared to the traditional in-class,

where everyone is doing the same activity simultaneously and the teacher is the main source of knowledge, now materials and information are available at any time and any place, so time and space management skills are increasingly important (Andrade & Du, 2007). On one hand, the idea of the ubiquitous learning environment is allowing students to learn without them even noticing or being completely conscious of it, but on the other, the boundaries between "work/play, learning/entertainment, accessing/creating information, public/private, formal/informal" (Burbules, 2012, p. 4) are blurring (Andrade & Du, 2007).

With the introduction of emergency remote learning, synchronous events have dropped significantly (Vollbrecht, Porter-Stransky & Lackey-Cornelison, 2020). At the Western Michigan University Homer Stryker M.D. School of Medicine the synchronous events dropped from 75% to 36% (Vollbrecht, Porter-Stransky & Lackey-Cornelison, 2020). In class, the synchronous events occur in real-time, while asynchronous events occur outside of classrooms and include instructions, readings, tasks, seminar papers, recorded lectures, etc. provided by the institution or professor. Asynchronous events are not necessarily bad for knowledge acquisition, but now more than ever education should take advantage of asynchronous learning since it is best used in remote circumstances (Daniel, 2020). Even though it requires some time management skills to be effective, it gives students and professors the flexibility to prepare and organize based on individual needs and wants. It saves professors time and gives more room to operate since there is no need to be present for lectures, upload materials and instructions at a fixed time, and also students can engage based on their schedule and preferences. In this context, it is important to stimulate communication between peers and their professors (Daniel, 2020). Vollbrecht, Porter-Stransky & Lackey-Cornelison (2020) reported, that mandatory events significantly dropped with the increase of asynchronous events, in fact in their emergency program, mandatory events went from 42% down to 15%. The major concern of such a substantial drop in mandatory events is the negative effect on student engagement. For the advantages of asynchronous, synchronous, and blended events see Figure 4.

Figure 4: Characteristics of synchronous and asynchronous teaching strategies
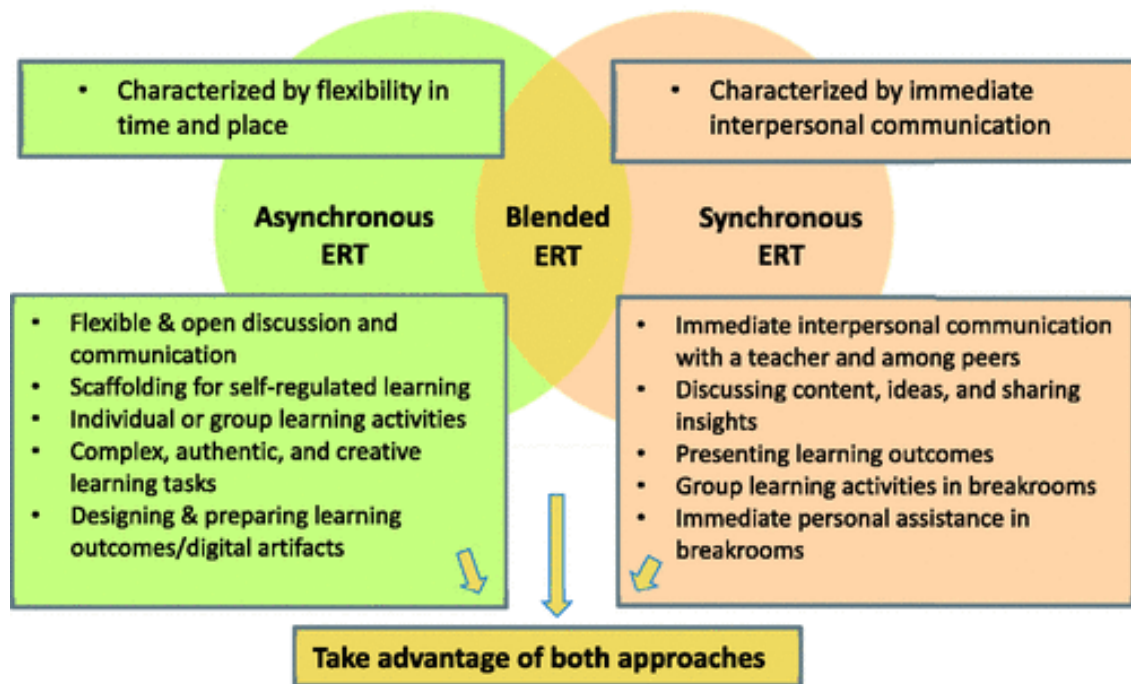
Source: Shamir-Inbal & Blau (2021).

Another effect of remote teaching on students is the lack of interaction they can acquire when compared to the face-to-face setting (Bartlett & Schugurensky, 2020). Remote learning contributes to the enhancement of individuality and computer skills, in lieu of teamwork, collaboration, and social-emotional skills. In remote, the limited opportunities to socialize can prevent peers from interacting, and socialization between different social groups, cultures, and backgrounds might disappear (Bartlett & Schugurensky, 2020).

2 MAIN CHALLENGES IN REMOTE LEARNING

Many believed that the Covid-19 pandemic will have a positive influence on a wider approval of technology integration in education (Rajab, Gazal & Alkattan, 2020). However, even before the Covid-19 pandemic, there was a growing propensity toward smart education (Rajab, Gazal & Alkattan, 2020). Some students do not have access to personal computers, high-speed internet, or encounter issues with the use of technology, but it is important to mention that professors are having issues with technology as well. And a smooth transition for professors is required to enable and implement remote teaching (Rajab, Gazal & Alkattan, 2020). According to the SERU Covid-19 Survey, 96% of bachelor's and 88% of master's students have experienced at least one issue in their transition to remote learning (Soria, Chirikov & Jones-White, 2020).

The authors Soria, Chirikov & Jones-White (2020) identified the following main issues students faced in remote undergraduate, as well as graduate studies:

- The lack of motivation for online learning;
- The lack of interaction or communication with other students;
- The inability to learn effectively in an online format;
- Distracting home environment or lack of access to appropriate study spaces;
- Course content that is not appropriate for online learning;
- Lack of clear expectations for online learning from the instructor(s);
- Lack of access to the instructor(s);
- Lack of access to academic advising,
- Inability to attend classes at their scheduled online meeting time;
- Lack of access to the technology necessary for online learning;
- Inability to access learning support services;
- Lack of familiarity with technical tools necessary for online learning.

The obstacles faced by students can be divided into two major groups: adaptive and technical. Adaptive issues are complicated, hard to recognize, and easy to ignore, other than the technical issues that are relatively easy to recognize and solve (Soria, Chirikov & Jones-White, 2020). While most of the issues experienced by students during the transition were adaptive, institutional leaders targeted from the beginning the technical issues like renting and buying the technical infrastructure and resources for students and professors (Soria, Chirikov & Jones-White, 2020). According to the SERU Covid-19 Survey, 61% of bachelor's and 41% of master's students believed that they are not able to study effectively in remote and most of those students in both educational levels believed that the course content was not suitable for remote learning (Soria, Chirikov & Jones-White, 2020). In the SERU Covid-19 Survey, some students specified the lack of technology as an important obstacle that they experienced in the switch to remote, but students were more likely to highlight the lack of non-technical reasons (Soria, Chirikov & Jones-White, 2020). Undergraduate students were less likely to specify "other" obstacles that were not listed in comparison to their graduated collages: "challenges serving as a caretaker to family members and lack of childcare, lack of access to on/campus resources (such as printers or lab equipment), research materials, and library resources/materials, inconsistent teaching style and increased workload expectations from faculty, faculty's poor integration of technology in their classes and lack of flexibility, poor mental health, difficulty concentrating, and increased stress, anxiety, and fatigue" (Soria, Chirikov & Jones-White, 2020, p. 3).

2.1   Zoom fatigue and its causes

The so-called "Zoom fatigue" is a new concept that describes the exhaustion created by the excessive usage of virtual communication platforms like Zoom, Skype, Microsoft teams, etc.

It is not the fatigue that people experience by staring for too long at the screen, because otherwise, we could also talk about "Facebook fatigue" or "Netflix fatigue", but it focuses on the fatigue that people experience from prolonged virtual interactions. During the pandemic, everyone involved in the educational or business world has experienced the difference that arises with the virtual setting. Nadler (2020) even compared skyping with his in-laws and calling his partner in the adjoining room. He argued that it is not necessarily the physical presence that makes the difference, but the spatial, since he can see his in-laws while skyping and they still feel so far away compared to his partner that he cannot see but feels closer because in the adjoining room. The idea behind audio-visual technology is to grant as many stimuli as possible depending on each party's wishes which have to enable the camera and microphone (Nadler, 2020). Even though professors and students, as well as workers in respective industries, increasingly used technology to help them in everyday tasks, there were still modus operandi like teaching, consultations, workshops, etc. that were done face-to-face.

Older research, as well as newer research relating specifically to Covid-19, can generally be grouped into issues on the side of faculty adjustment to remote teaching, and issues related to student learning. On the side of student learning, one of the major concerns cited in the literature is the absence of some aspects of communication. Because nonverbal communication provides the observer with so many implicit signals, gestures are per se sometimes difficult to decode (Nadler, 2020). Depending on our well-being and decodifying abilities but also the communicator himself, we will sooner or later feel the fatigue of the interaction (Nadler, 2020). In other words, different settings require a different amount of "force" or "energy" invested in an interaction (Nadler, 2020). During lockdowns, meetings, lectures, consultations, etc. were exclusively remote and even if the cameras are enabled, signals are provided mostly or just by facial expressions and not by the whole body as during face-to-face interactions (Nadler, 2020). Because of the limited source of cues, it has been suggested, that remote compared to face-to-face interactions increase listeners' cognitive effort (Nadler, 2020). So, to capture the implicit signals, remote listeners have to invest more effort and consequently feel more exhausted at the end of the interaction (Nadler, 2020).

As Gianpiero Petriglieri told for BBC Worklife, besides the greater amount of focus required by remote interactions in ideal conditions, there are frustrating and tiring interruptions like screen freezing, weird echoes, delays, etc. that are the result of poor internet connections or disturbances (Jiang, 2020).

Another problem with remote interactions is silence (Jiang, 2020). During face-to-face interactions, it is an important and effective communication tool that can serve different purposes, but in remote, it is considered irritating (Jiang, 2020). It makes people uncomfortable and concerned about the technology, while the speaker is perceived as unfriendly or unfocused (Jiang, 2020).

In addition, the Covid-19 pandemic has brought severe measures and forced the global population into isolation. The negative effect of the pandemic and isolation on mental health, which will be treated in more detail in chapter 2.4.3 Effects on health, is also playing a main role in our perception of remote interactions and the related fatigue experienced. In other words, I am suggesting that the Zoom fatigue that many experienced during lockdowns was influenced by the weakened mental health and exclusive remote interactions of the population and that in non-pandemic conditions the perception of fatigue in computer-meditated communications would be different.

2.2   Dropout concerns

One of the major issues that OUs were facing before the pandemic was the perseverance of young students. For instance, a study conducted in 2017 by the Commonwealth of learning on 27 OUs within the Commonwealth, has shown an average output rate of only 15.26% (Mishra, 2017). So, it´s normal to question the impact of remote models on the retention and success rate of young students enrolled in a full-time tertiary education program.

Some studies suggest a decrease in applications and a decrease in the retention rate, like the one conducted in February 2021 by Kawaijuku, according to which Japan has recorded a 12% decrease in applications for the country's 107 major private universities' exams (Kakuchi, 2021).

Opening also means taking risks in terms of success, dropout, and retention. Past educational achievements make progression more likely and opening usually means granting access to those that are less probable to finish the program (Tait, 2018a). A probable consequence of opening would be a higher dropout rate and/or lower passing standards which could affect Universities' reputations and most importantly students' knowledge. In fact, before the pandemic, remote and part-time students were more likely to face challenges with time and energy because of family and jobs, due to their social background, compared to the full-time cohorts (Tait, 2018a).

2.3   Implications on social networks

A social network is a social structure that describes social relationships and interactions between actors (Long et al., 2022). It ranges from family, partners, coworkers to friends and acquaintances (Long et al., 2022).

During the most stringent measures governments imposed regarding Covid-19, face-to-face interactions were limited to those living in the same household (Long et al., 2022). In general, interactions became more restricted to those closest while many weak ties went lost (Long et al., 2022). According to Ian Leslie (2020), weak ties and casual acquaintances can boost knowledge, happiness, and a sense of belonging, which suggests that the overall well-

being and knowledge acquisition are negatively influenced by the remote setting and the governmental measures to contain the spread of the Covid-19 pandemic.

Social networks measure the ability and connections of individuals to benefit from other peoples' knowledge, to confront new and unfamiliar obstacles and are a very important determinant in forecasting the success rate of tertiary education (Moschetti & Hudley, 2015). During in-class teaching, it was the most influential predictor of tertiary education dropout in the first year, despite considering aspects like gender, race, full-time employment, and financial aid status (Moschetti & Hudley, 2015). Mostly, but not necessarily, students from low-socioeconomic households that are the first to attend a postsecondary education are lacking the social capital that would help them achieve their academic goals (Moschetti & Hudley, 2015). They are lacking basic knowledge about tertiary education like costs, procedures, preparation, and planning. Having a family member with a college degree is highly related to being aware of college life, having clearer expectations, and getting moral support (Moschetti & Hudley, 2015). Additionally, students with little social capital are less likely to understand the importance of social capital and the creation of new ties with colleagues and institutional agents that can provide additional support, assistance, information, and guidance (Moschetti & Hudley, 2015). As a result, those students which have little resources and information and would need greater assistance in order to make a successful transition from secondary to tertiary education systems, get even less assistance, because of the lack of social capital, social abilities (Moschetti & Hudley, 2015) and remote learning. In addition, independent networks are not equally adaptable to changes (Long et al., 2022). For instance, those who newly enrolled in universities and created new social ties just before the pandemic declaration may have had difficulties transferring those to remote (Long et al., 2022).

2.4   Covid-19's effect on tertiary education and students

Experiencing dissatisfaction or distress in students' learning environment can negatively affect performance (Cotton, Dollard & De Jonge, 2002) and because of the Covid-19 pandemic measures, students' lives have been completely disrupted. The most affected are those at a turning point in their life. Those that during the pandemic were starting the undergraduate or graduate programs or those finishing their tertiary education and looking for a job were facing particular challenges since they were not able to start or finish their school curriculum and assessment in an orthodox way (Daniel, 2020).

2.4.1   Effects on students with lower socio-economic status

It is impossible to speak about the implications of remote teaching during the Covid-19 pandemic without considering the implications of moving back home and the socioeconomic differences within societies. To understand how social backgrounds are influencing remote

learning, we must understand what divides social classes and how they affected education before remote teaching was introduced on a massive scale because of Covid-19.

Social classes are a division of the population based on cultural, social, and material backgrounds (Weis & Dolby, 2012). This kind of classification is often also seen as an illusion or non-existing, but the influence of the social environment on growth, education, career, etc. is evident (Weis & Dolby, 2012). Where and when we travel, what we eat, what and where we learn, what we believe, how we think, where we live, how we behave, our expectations, etc. are just a small part of what defines our social class and vice versa (Weis & Dolby, 2012). Economists tend to focus on income to define social status (Blanden, Gregg & Macmillan, 2013) and income inequalities are increasing within and outside national boundaries (Weis & Dolby, 2012). However, according to Kohn (1979), the most important factors determining social class are occupation and education, and only of secondary importance is the income level.

Even though some patterns can be differentiated based on social class, we cannot suppose there are specific attributes that apply to the whole class (Hughes & Perry-Jenkins, 1996). For instance, socioeconomic status does not define the home environment but rather influences the structure and the functioning of the family which will consequently be crucial in the ambition to recreate the cultural ideal of home (Hughes & Perry-Jenkins, 1996) and a pleasant learning environment. Another good example are job experiences that form social values which are then brought into our private lives and affect relationships (Hughes & Perry-Jenkins, 1996).

Especially during difficult times, people from lower socioeconomic strata are struggling the most. And even though it is true that the coronavirus is not discriminating, our social status is. There are factors related to a lower socioeconomic status that are influencing the likelihood of getting exposed to the coronavirus as well as other respiratory viruses. For instance, people with lower socioeconomic status normally have jobs that do not offer a remote alternative and live in smaller living spaces with more people (Patel et al., 2020). This makes social distancing very difficult and increases the probability of getting infected. But poverty does not only increase the probability of getting infected, it is also linked with higher stress, due to financial uncertainties, which results in a weakened immune system (Patel et al., 2020).

Higher education is perceived as the grantor of stable employment and a better income level (Browmana, Destina, Carswelld & Svobodab, 2017). And in fact, education is the most important factor defining the degree of social mobility and therefore a key determinant of students' future social class (Browmana, Destina, Carswelld & Svobodab, 2017). But educational success is also highly related to social backgrounds (Browmana, Destina, Carswelld & Svobodab, 2017). Many factors are influencing individual success, but for students from lower socioeconomic classes, the lack of belief in social mobility and consequently motivation is a common characteristic leading to failure (Browmana, Destina,

17

Carswelld & Svobodab, 2017). Studies suggest that academic success is not only related to socioeconomic class but also the academic background of our environment (Browmana, Destina, Carswelld & Svobodab, 2017). In other words, exposure to a less successful society makes success look very improbable and students need to see the relationship between education and an achievable opportunity to be resilient and successful (Browmana, Destina, Carswelld & Svobodab, 2017). Eventually, first-generation students might be negatively influenced in remote by their home environment and society.

According to the SERU COVID-19 Survey, scholars brought up the issue of how remote teaching is desperately affecting students of lower socio-economic backgrounds (Soria & Horgos, 2020). According to the study, low-income and working-class students faced more difficulties during the transition from in-class to remote learning compared to their peers from the middle and upper classes. One-third of low-income students cited the lack of technology as a real issue in the adjustment to remote learning compared to the 11% of middle- and upper-class students. Also, the lack of an appropriate learning space was more frequent among low-income (66%) than middle- and upper-class students (50%) (Soria & Horgos, 2020).

Not only the SERU Consortium but in general the issues that were debated about homeschooling are now applying to the remote learning model (Bartlett & Schugurensky, 2020). One of the biggest fears is that remote learning could lead to elitism since the asymmetries between social classes are augmenting educational inequalities (Bartlett & Schugurensky, 2020). Not only are students exposed more to their home environment, but also don't have access to the common educational infrastructure. Socioeconomically privileged students have adequate conditions to create an ideal environment for study purposes, while some disadvantaged students may even lack the most basic needs such as devices and connectivity (Bartlett & Schugurensky, 2020).

If on one hand, remote learning might not be the best solution for low-income students, on the other, remote learning has made education more accessible for people with disabilities. Living in another city or commuting every day can be very exhausting and expensive and the option to be remote has simplified and given a further option to people with disabilities of any kind.

2.4.2   Effects on security, food, and housing

The transition to remote learning has not only affected the educational system and learning processes, but it affected every single part of the economy and with it also the already economically vulnerable students (Rajab, Gazal & Alkattan, 2020).

The Covid-19 pandemic has enlarged the existing gap between students from different financial backgrounds. Lost on or off-campus jobs, unemployment of family members and

increased living and study expenses are some of the problems that low-income students, which are already living in fragile conditions, were confronted with.

According to Grimard & Maddaus, 2004, youth from rural communities are less likely to start as well as finish postsecondary education. This is also because rural youth must decide if they want to stay in their community or abandon the community to seek education and employment (Grimard & Maddaus, 2004). Housing prices in Slovenia are rising in an unsustainable manner, especially in urban areas where higher education possibilities are concentrated, making it harder and harder for students from rural areas to move to urban centers. In addition, average earnings in rural communities are much lower compared to urban areas (Statistics Canada, 2010). This implies that teenagers from rural areas that would like to pursue higher education and usually face higher costs to do so, have at the same time a lower family income compared to their peers from urban areas. But also remote learning might not be the best solution for students from rural areas. According to a report from the Michigan State University's Quello Center, limited or slow internet connections in urban areas might result in students falling behind academically (Bauer, Brooks & Hampton, 2020).

A final issue discussed by researchers of the switch to remote teaching concerns basic survival problems, such as food insecurity. In the United States, during the first period of the pandemic, every fifth student encountered food insecurities (Soria, Horgos, Jones-White & Chirikov, 2020). First-generation, low-income, Black, Hispanic international, transgender, gay, bisexual, pansexual, and other students from marginalized backgrounds are the most affected by financial hardships (Soria, Horgos, Jones-White & Chirikov, 2020). The SERU Covid-19 Survey reported that 21% of undergraduate students had sometimes or often concerns about running out of food before they could buy more (Soria, Horgos, Jones-White & Chirikov, 2020). 14% of undergraduate students cited that they ran out of food without sufficient money to buy more (Soria, Horgos, Jones-White & Chirikov, 2020). Graduate students had slightly lower concerns with 18% of students concerned about food shortages and 11% experiencing food shortages (Soria, Horgos, Jones-White & Chirikov, 2020). When we extract and analyze those results based on the demographic groups, the food insecurity rates are remarkably higher for students from marginal backgrounds (Soria, Horgos, Jones-White & Chirikov, 2020). 58% of low-income students, 40% of non-binary, caregivers for adults and working-class students, 38% of those who cared for their children, international students, and first-generation students experienced food insecurities (Soria, Horgos, Jones-White & Chirikov, 2020). According to the SERU Covid-19 Survey, there was a slight increase in food insecurity during the pandemic, however, we cannot say that there is a direct influence of the pandemic on the food insecurity of students (Soria, Horgos, Jones-White & Chirikov, 2020). Nevertheless, the loss of student jobs and the jobs of family members may have influenced the perception of food insecurity among students (Soria, Horgos, Jones-White & Chirikov, 2020).

2.4.3 Effects on health

Patients that had the coronavirus are experiencing long-lasting symptoms like fatigue and mild fever that normally disappear within a few days (Doykov et al., 2020). It is called "Long Covid", "Long-Haul Covid" or "Long-Tail Covid" and in most cases, the patients were in excellent conditions before the infection. A study, conducted by Doykov et al. (2020), has shown that in all patience there are significant inflammatory responses even after 40 to 60 days. This includes also asymptomatic patients and those with moderate infections (Doykov et al., 2020). Even if the effects of the so-called "Long-Tail Covid" on student performance have not been tested yet, a drop in attention span and inability to focus are side effects that everyone has been confronted with during ill-being. And it can be a major obstacle for students' knowledge acquisition, engagement, and consequently education itself.

The coronavirus rapidly became a global pandemic and the physical health concerns were quickly followed by the mental health concerns of the population that experienced deaths or serious complications (Marelli et al., 2020). But also discomforts like isolation, moderate illness, and fear of survival may become serious issues, that in some cases can develop into PTSD (Post Traumatic Stress Disorders hereinafter PTSD) (Marelli et al., 2020). Even being exposed and/or asymptomatic has been a very stressful situation due to the obligations to share the news and quarantine. But stress is part of everyone's life and in little quantities, it can even help to focus, get things done, and make positive changes (Wolpow, Johnson & Hertel, 2009). However, when the stress accumulated is big enough it can become self-destructive and develop into anxiety and/or depression and in some cases even leaving permanent mental damage that might lead to deleterious behaviors like substance abuse, eating disorders, insomnia, etc. (Wolpow, Johnson & Hertel, 2009). By the time the pandemic broke out, public opinion further harmed the mental well-being of those already weak as a result of being quarantined and ill.

Researchers found a correlation between acute contagious diseases like Covid-19 and mental issues such as anxiety, depression, stress, and post-traumatic stress (Marelli et al., 2020). This included infected and non-infected people (Marelli et al., 2020). Studies among young students and workers show the negative effect of the Covid-19 outbreak on routines and habits (Marelli et al., 2020). Since the Covid-19 outbreak young adults spend more time on social media before bed, spend more time in bed, go to bed and wake up later and get less quality sleep (Marelli et al., 2020). Bad habits that additionally damage mental as well as physical health.

Compared to their peers, low-income students are more prone to anxiety, depression, and other mental disorders (Chirikov, Soria, Horgos & Jones-White, 2020). Besides, students from low-income families are also more likely to encounter issues during the transition to remote learning (Chirikov, Soria, Horgos & Jones-White, 2020). But how students transit from in-class to remote is an important determinator of their overall well-being and mental health. Consequently, low-income students that are more prone to mental disorders, have

encountered additional obstacles during the transition to remote and were even more inclined toward mental illness and at an even higher risk to become mentally unstable.

The SERU Covid-19 Survey conducted a research that examined the effect of the switch on remote learning on student mental health (Chirikov, Soria, Horgos & Jones-White, 2020). The research confirmed that students which reported mental issues also reported the inability to properly adapt to remote learning (Chirikov, Soria, Horgos & Jones-White, 2020). As reported by SERU Covid-19 Survey, one-third of students screened positive for serious depressive disorders and 39% screened positive for general anxiety disorders (Chirikov, Soria, Horgos & Jones-White, 2020). Compared to data from 2019, in 2020 there were twice as many considerable depressive disorders among undergraduate as well as graduate students, while generalized anxiety disorder increased by 50% in that same period (Chirikov, Soria, Horgos & Jones-White, 2020). As reported by the SERU Covid-19 Survey, the Covid-19 pandemic is having a negative influence on the mental health of students in tertiary education (Chirikov, Soria, Horgos & Jones-White, 2020).

How trauma affects learning and learning abilities has been reviewed by the Massachusetts Advocates for Children in the book Helping Traumatized Children Learn.

- "Acquisition of academics (e.g., reading, writing, and math) requires attention, organization, comprehension, memory engagement in learning, and trust. Traumatic stress from adverse childhood experiences can undermine the ability of children to form relationships, regulate their emotions, and learn the cognitive skills necessary to succeed academically.
- When students enter the classroom with symptoms of trauma (hyperarousal, intrusion or constriction), they may be unable to process verbal/nonverbal and written academic information. They tend to have limited ability to understand or respond to classroom instructions or explanations, or to retrieve information on demand.
- Traumatized students struggle to use language to relate to people, often because they are unable to use language to articulate emotional needs and feelings. Consequently, they have trouble identifying and differentiating emotions. While they may be somewhat effective in using language to get something from somebody, they struggle with the language of mutual relationship. Many students struggle to relate well with others, or in conveying abstractions, both of which are essential skills required for higher-level learning.
- Successful completion of many academic tasks depends on the ability to bring linear order to the chaos of daily experience. When one comes from a home where sequencing is not logical, where things are "out of order" one's ability to organize material sequentially may be inhibited. This is often shown in poor ability to organize, remember and store new information. It may also result in struggles to understand cause and effect relationships.
- When a child does not feel safe expressing a preference without first assessing the mood of a potentially volatile parent, he or she cannot fully develop a sense of self. This may

result in an inability to define boundaries that often leads to difficulties in making independent choices, articulating preferences and gaining perspective. Deficits in this area can make it hard to solve a problem from a different point of view, infer ideas from a text, or participate in group work or exhibit empathy of another.

- The so-called executive functions—setting goals, developing a plan, anticipating consequences, carrying out goals, reflecting on the process—are very important for achieving academic success and, for reasons listed above, are often lacking for children who have experienced trauma. (Sometimes children are very focused on what they need to survive instead of those things needed for academic success.) These children tend to "act instead of plan."

- Children affected by trauma have trouble with classroom transitions (endings and beginnings). After all, if one finally feels safe in one situation, transition from one situation to another could be wrought with danger.

- Classroom behavioral adaptations to trauma include aggression, defiance, withdrawal, perfectionism, hyperactivity, reactivity, impulsiveness, and/or rapid and unexpected emotional swings. Trauma-related behaviors are often confused with symptoms from other mental health issues such as ADHD and mood disorders such as bipolar disease and depression. When educators review the reasons that children are not behaving and/or learning, trauma should be considered a possible contributing factor. Trauma is one potential cause of these problems, one that is often overlooked. However, it is often only one of several contributing factors." (Wolpow, Johnson & Hertel, 2009, p. 12–13).

One of the strongest prognosticators to predict PTSD is past trauma (Michigan Medicine, no date). According to the data from the website of the University of Michigan Hospital, most people do not develop PTSD after a traumatic event and recover from it within 30 days. If we consider that the majority recover within 30 days and sum it to the duration of the illness and quarantine (not considering Long Covid or severe cases), we can expect students that experienced Covid-19 as a traumatic event to fully recover in one to three months. This can be very hard to manage, especially if it happens during a sensitive period like it is the exam period for students. And cases of PTSD due to Covid-19 in combination with stress from course duties can also not be excluded.

According to pre-pandemic studies, the estimation of potentially traumatic events in college students ranged between 55.8% and 84.5% (Smyth, Hockemeyer, Heron, Wonderlich & Pennebaker, 2008). And the fact that having past traumatic experiences is linked to a higher probability of developing PTSD in the future and that Covid-19 is a potentially traumatic event, mental health has been a major concern for students during remote education.

Wolpow, Johnson & Hertel (2009) suggest, that trauma is influencing education outcomes and that students that have experienced traumatic events:

- Are two-and-one-half times more likely to fail a grade;
- Score lower on standardized achievement test scores;
- Have more receptive or expressive language difficulties;
- Are suspended or expelled more often; and,
- Are designated to special education more frequently.

The outcomes of the pandemic and increasing mental issues have also increased alcohol consumption among students (Lechner et al., 2020). Students increased alcohol consumption on drinking occasions as well as drinking occasions (Lechner et al., 2020). Those with fewer signs of mental illness and more perceived social support cited less alcohol consumption (Lechner et al., 2020). Previous studies showed that there is a bilateral relation between mental illnesses and alcohol abuse (Lechner et al., 2020). The stronger the depression symptoms the higher the likelihood of alcohol abuse and alcohol problems anticipate future depressive symptoms (Lechner et al., 2020).

2.4.4   Perception of time

Time perception is of fundamental importance for perceptual and cognitive processes and is consequently essential for understanding knowledge acquisition and engagement.

When we think about time, we have this linear idea of time going from left to right, up to down, or vice versa. And objectively seen time passes at a constant rate that cannot be manipulated. Nevertheless, we know that time is not that linear after all, at least the perception of time is not. While some substances can interfere with our perception of time, our lifestyle and habits can influence it as well. The activities we perform and the emotions that we experience distort it (Ogden, 2020). For instance, waiting in the waiting room for your turn slows time down and a busy period accelerates it. But we are not like on/off switches just waiting or in complete focus. Studies have shown that familiar activities and those of lower complexity slow time down even though we are active (Ogden, 2020). So, it would be more accurate to point out that the physical and cognitive load defines the sensation of time or even more precisely, defines our cognitive capacity to focus on the passing of time (Ogden, 2020).

Waiting and isolation are usually associated with slowing time down while socialization and busyness are associated with speeding time up. So, when the Covid-19 pandemic started and countries were forced to lockdown, people would be expected to be more aware of time and consequently slow the passage of it. But interestingly, according to Ogden S. Ruth (2020) for citizens from the United Kingdom time didn't pass slower or faster, but it was rather distorted. For most of the respondents, time passed differently compared to the pre-pandemic period, but not in one direction (Ogden, 2020). The respondents split almost equally between

faster and slower (Ogden, 2020). Therefore, lockdown seems to have different outcomes when it comes to the perceptions of time. The research showed that the perception of time was affected by several factors such as satisfaction, depression, stress, age, workload, etc. and their correlation (Ogden, 2020), but for the purpose of this paper it is relevant that the lockdown didn't influence unilaterally the perception of time and that the sudden change in everyday life routines, work schedules, work type, increased childcare necessity, etc. distorted time perception during this period.

3   BENEFITS OF REMOTE LEARNING

The main objective of the UL and also the main benefit of the massive switch to remote during the Covid-19 pandemic was to keep students and employees at a safe distance to prevent them from contracting the coronavirus. But even after the pandemic tertiary education should take advantage of the adaptability, stability, and cost-efficiency of remote learning. Other unforeseen environmental changes might occur in the future such as war, regional conflicts, natural disasters, etc. which emphasizes the importance of preparing and enhancing remote education (Shim & Lee, 2020).

The most popular educational approach among students combines in-class with online learning, allowing students to benefit from both settings' advantages. Regular in-class teaching combined with remote teaching has been tested and proven to be valid by Sitzmann T. and colleagues already back in 2006. They found that the so-called blended learning was more effective to teach declarative as well as procedural knowledge. Declarative knowledge was 13% more effective and is the knowledge that refers to the memory of information and principles taught, while procedural knowledge was 20% more effective and refers to knowledge about the processes to perform a task (Sitzmann, Kraiger, Stewart & Wisher, 2006)

3.1   Smart learning

With the huge evolution of computing devices in the last 50 years, industries were able to disseminate technology nearly everywhere (Mikulecký, 2012). This also allowed the creation of smart environments that are now the fundament of our smart work or study spaces. The idea behind smart spaces has gone far beyond having a pc and a Wi-Fi network which is nowadays a basic requirement to study or work remotely. We have reached a point where the goal is to enrich work and study spaces with sensors and devices that serve as electronic butlers (Mikulecký, 2012). The subjects are scanned at regular intervals and automatic actions are taken to enhance the well-being and productivity of the user (Mikulecký, 2012). The user's routine tasks are replaced by customized interfaces that can go from facilitating tasks, executing tasks, predicting and anticipating activities, improving time management, etc. (Mikulecký, 2012). It prevents the user from losing time and

concentration on minor problems and replaces those with knowledge and comfort (Mikulecký, 2012).

The most used and well know hand-free or voice-controlled Intelligent Personal Assistants are Google Assistant, Alexa, Siri and Cortana. Many other similar human-computer interfaces allow the use of different sensors and devices to improve everyday life as well as study and work (López, Quesada, & Guerrero, 2017), but for the purpose of this master thesis, it is not relevant to count and describe them all.

Nowadays younger generations don't have many issues with technology. In fact, setting up devices and creating smart rooms in order to improve their productivity and well-being wouldn't be very hard for most students at the UL. But even though most teenagers are very proficient in computer skills, even before enrolling in a tertiary education program, this doesn't mean they will perform well in a remote setting (Hobbs & Hawkins, 2020). In addition, technology indeed improved our lives in the last few decades but an aged educator, as well as learners, might find it challenging to adapt (Saikat, Dhillon, Wan Ahmad & Jamaluddin, 2021). Also, many education experts claim that there is a big difference between what students can achieve in their free time for fun and how effectively will they use digital materials and devices for educational purposes (Hobbs & Hawkins, 2020). Since younger generations spend most of their time on their devices, we forget that switching to remote can be challenging for younger generations as well (Hobbs & Hawkins, 2020). However, since distant learning has expanded technology use, it also promoted computer literacy, which is becoming increasingly important in the labor market.

3.2   Financial aspect

Even though Slovenia is a very affordable place to finish a tertiary education program compared to other developed countries, there are major costs related to tertiary education because of the face-to-face setting such as transportation and accommodation. As mentioned in chapter 2.4.2 Effects on security, food, and housing, due to a lack of housing, both rental and purchase prices are at all-time highs.

In remote, living and travel expenses can be avoided, but there are also fixed educational fees based on the modules and courses that students select. Theoretically, the only mandatory cost at the UL for full-time students is the enrollment fee of 29 Euros for the first enrollments and 21 Euros for each additional enrollment (Univerza v Ljubljani, no date b) but that's far from reality. For instance, excluding the costs of living and commuting, each year of education at the Faculty of Architecture will cost you between 2000 and 3000 Euros (Kamenarič, 2018). Other Faculties at the UL cost on average below 700 Euros per year (Kamenarič, 2018) while local student dorms, which are the most affordable accommodations for students who are not from Ljubljana, cost on average 927 Euros per year without including variable costs like dorm security, damages, dorm funds, and student council funds (Študentski dom Ljubljana, no date). In addition, the price of public

transportation and travel to their hometown must also be taken into account. Therefore, for non-local residents enrolled at the UL, physical presence is the most expensive component of tertiary education.

Figure 5 shows the increasing real estate prices in Slovenia from 2014 to 2021. Real estate prices are also reflecting rental prices. The increase in prices is even larger in urban areas where demand for rental as well as acquisition is very high (Zavec, 2021).

Figure 5: Annual real estate prices indices for Slovenia
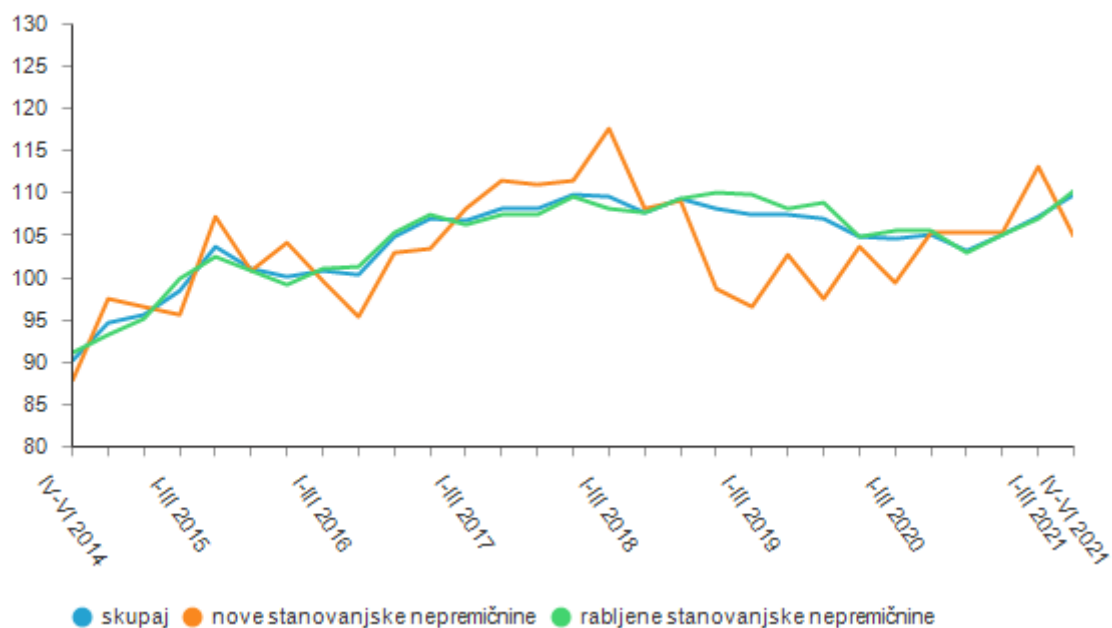
(Blue = together , Orange=New real estates, Green = Resale real estates)

Source: Zavec (2021).

3.3   Commuting

One of the biggest and most stressed benefits in literature covering remote learning is the flexibility of the remote setting. Not only because of the increased asynchronous tasks and events that allow students to adjust their progress based on their preferences but also because they don't need to bother with what to wear or worry about commuting (Shim & Lee, 2020). According to research conducted by the ATUS (American Time Use Survey), there is a trade-off between commuting time and health-related activities such as physical activity, preparing food, eating meals with family, and sleeping (Christian, 2012). The research showed that an increase in daily commute time of 60 minutes is linked to a 6% drop in health-related activities, and an increase of 120 minutes is linked to a 12% drop (Christian,

2012). Longer commutes are also associated with increased levels of stress and weariness, which may have an impact on commuters' health (Christian, 2012). Prior studies have examined the association between commute length and absence due to illness finding a correlation between longer commutes and greater absence rates (Gimenez-Nadal & Molina, 2019).

4 METHODOLOGY

4.1 Research framework

The purpose of this thesis is to provide an insight into the sudden change to remote and its effects on time management, engagement, and learning process of students enrolled at the UL. Since the switch to remote happened during the Covid-19 pandemic and it had an enormous impact on students' general well-being and education, it was included in the thesis as a driving force behind the switch to remote. This thesis helps to understand the impact of remote learning during the Covid-19 pandemic on performance, effectiveness, and knowledge acquisition and provides faculties, professors, and students with insights on the most problematic areas and ways to improve them.

The goals were to:

- To review the literature on the effects of remote learning and Covid-19 on tertiary education;
- To determine the main challenges of students in tertiary education and how it applies to the current pandemic and remote teaching situation;
- To determine the issues that are preventing students from a successful transition to remote;
- To measure the attitudes of Slovenian students toward remote learning;
- To measure the effects of remote learning and Covid-19 on the learning and engagement of Slovenian students;
- To provide recommendations for future improvements in remote teaching and after Covid-19 conditions.

The thesis relies on both secondary and primary data. To understand the effects of remote learning on tertiary education and remote productivity factors and build the fundamental theoretical framework, secondary sources like scientific papers and articles were used.

4.2 Primary data collection method

The main part of the thesis relies on an empirical study based on primary data collection. The data presented is based on a quantitative survey. The demographic questions include

gender, faculty, educational level, household income, employment, and housing status. The dependent variables are student motivation, engagement, and time management, which were measured quantitatively using established scales. An online survey was created in English and promoted to undergraduate and graduate students enrolled at the UL during the school year 2020/2021 through social media and networks. The survey was created in English to include Erasmus and foreign students that would otherwise be excluded. In this way, the sample is more representative of the population of enrolled students in full-time UL programs. During the Covid-19 pandemic, online was the only possible and safe option to collect data. To gather deeper information, I focused only on students enrolled in UL full-time programs. The aim was to gather at least some fulfilled questionnaires from every faculty from the UL. The data was analyzed using descriptive statistics and hypothesis testing.

Primary data was structured and collected through the online survey tool EnKlikAnketa, better known as 1KA. The application is free of charge for students enrolled at the UL by using the university e-mail and allows to create surveys and do some basic data analysis. Data collection was hindered by the pandemic and the measures imposed by the Slovene government to contain the spread of Covid-19 and limited to online approaching. With regard to the pandemic, I opted for convenience sampling and posted the link to the survey on private Facebook groups of student dorms. To do so, I had to send a request to the Facebook administrator of each student dorm group separately explaining the reason for my request to join the group. Once approved, I posted the link to the survey with a short introduction to the survey. In this way, I managed to reach residents from 22 different dormitories across Ljubljana. This allowed me to reach at least one student from each faculty and create a representative sample population. Foreign students were a little more challenging to include since I was not able to reach them through the usual convenience sampling. When circumstances allowed, I opted for purposive sampling and approached Erasmus students personally. This led to snowball sampling because they did not only help me by taking part in the survey, but also reached other Erasmus students in Ljubljana.

In the first part of the questionnaire, I aimed to identify the population and exclude those that aren't enrolled in a full-time tertiary program and therefore not part of the selected population. The main part of the questionnaire was about the issues that students encountered during their remote studies and their attitudes toward them. In the final part of the questionnaire, sensitive and demographic questions were asked.

The questionnaire consists of 26 questions divided into 6 sections, plus the introductory page. The average time to solve the questionnaire was about 8 minutes. The questionnaire was online from 5th March 2021 until 20th April 2021 and got 269 valid responses, but only 223 were fully finished and considered.

4.3   Sample description

In the school year 2020/2021, the population of the UL was 40,607 students of which 3,653 were foreign students (Univerza v Ljubljani, no date a). 23,543 were undergraduate students (57.98%), 14,863 were master's students (36.60%) and 2,201 were Ph.D. students (5.42%) (Univerza v Ljubljani, no date a). I managed to gather 223 fully finished respondents from the UL of which 131 were undergraduate students (58.74%) and 92 were graduate students (41.26%).

Most of the respondents were studying at the School of Economics and Business, Faculty of Arts, and the Biotechnical Faculty which is in proportion to the actual population at the UL. In fact, the three biggest faculty per enrolled students at the UL are the School of Economics and Business (5,183, 12.76%) Faculty of Arts (4,763, 11.73%) Biotechnical Faculty (3,009, 7.41%) (Univerza v Ljubljani, no date a).

As mentioned above, I managed to reach non-Slovene students studying at the UL and include them in the research. Despite the effort, I was able to gather just 5.83% out of 8.99% of the actual population, of which 4.03% were Erasmus students, 0.9% were foreign students from non-EU countries and 0.9% were students from foreign EU countries (Univerza v Ljubljani, no date a).

The gender share of the sample doesn't reflect exactly the population. In both cases, females were prevailing, but the sample has, with 30.49% men and 68.61% female (0.90% didn't want to respond), a slightly higher percentage of females compared to the actual population of 40.20% men and 59.80% female (Univerza v Ljubljani, no date a).

Different faculties might have different scores and approach remote learning in different ways based on their possibilities and needs, but for the purpose of this thesis, I decided to compare aggregate data and divide the population into faculties to have an overview of the sample population and its representativeness.

The following faculties/options allowed students to proceed and take the questionnaire:

- Academy of Fine Arts and Design - Akademija za likovno umetnost in oblikovanje;
- Academy of Music - Akademija za glasbo;
- Academy of Theater, Radio, Film and Television - Akademija za gledališče, radio, film in televizijo;
- Biotechnical Faculty - Biotehniška fakulteta;
- Faculty of Architecture - Fakulteta za arhitekturo;
- Faculty of Arts - Filozofska fakulteta;
- Faculty of Chemistry and Chemical Technology - Fakulteta za kemijo in kemijsko tehnologijo;
- Faculty of Civil and Geodetic Engineering - Fakulteta za gradbeništvo in geodezijo;
- Faculty of Computer and Information Science - Fakulteta za računalništvo in informatiko;

- Faculty of Education - Pedagoška fakulteta;
- Faculty of Electrical Engineering - Fakulteta za elektrotehniko;
- Faculty of Health Sciences - Zdravstvena fakulteta;
- Faculty of Law - Pravna fakulteta;
- Faculty of Maritime Studies and Transport - Fakulteta za pomorstvo in promet;
- Faculty of Mathematics and Physics - Fakulteta za matematiko in fiziko;
- Faculty of Mechanical Engineering - Fakulteta za strojništvo;
- Faculty of Medicine - Medicinska fakulteta;
- Faculty of Natural Sciences and Engineering - Naravoslovnotehniška fakulteta;
- Faculty of Pharmacy - Fakulteta za farmacijo;
- Faculty of Public Administration - Fakulteta za upravo;
- Faculty of Social Sciences - Fakulteta za družbene vede;
- Faculty of Social Work - Fakulteta za socialno delo;
- Faculty of Sports - Fakulteta za šport;
- Faculty of Theology - Teološka fakulteta;
- Faculty of Veterinary - Veterinarska fakulteta;
- School of Economics and Business – Ekonomska fakulteta.

4.4 Data analysis method

Descriptive variables are presented as frequencies and percentages, and numeric variables or ordinal descriptive variables are presented as mean and standard deviation or median and interquartile range (first and third quartile), respectively. A comparison between two descriptive variables was performed using the Chi-Square test after checking the values of expected frequencies in each contingency table (expected values >5 in each cell of the selected contingency table). The comparison between the three groups based on monthly income in selected ordinal variables was performed using the Kruskal-Wallis test. All analyses were performed in the statistical program IBM SPSS version 25.

5 FINDINGS

In order to identify the various factors affecting knowledge acquisition and engagement during lectures in remote, many foreign studies have been reviewed. The data gathered from students enrolled at the UL showed that students in Slovenia have been experiencing very similar issues with remote learning as foreign students. The biggest surprise came from the income division of the sample. In fact, students from lower-income families had comparable values as students from middle and upper-income families and didn't report any evident difference.

5.1 Attitudes towards teaching methods

Table 1 presents the preferred teaching method of students at the UL in a non-pandemic environment. The preferred teaching method is optional with 41.26% of the students which means that students can choose to follow the lecture remotely or in-class based on their needs and wants, followed by in-class teaching with 37.22% and hybrid with 19.73% which means that some classes are online and some on remote based on professors' preferred method. Only 1.35% preferred remote teaching and 0.45% didn't have preferences about the teaching method. Similar preferences have been identified at the Alfaisal University in Riyadh with the difference that more students at the UL would like to switch back to in-class teaching (+11.72%) and just a few students preferred remote teaching (-10.65%) compared to students from the Alfaisal University in Riyadh.

Table 1: Students' attitude toward teaching methods in a non-pandemic environment

		f	f (%)
Preferred teaching method in a non-pandemic environment	In-class teaching	83	37.22%
	Remote teaching	3	1.35%
	Hybrid	44	19.73%
	Optional	92	41.26%
	I don't have preferences	1	0.45%
	Total	223	100%

Source: Own work.

Interestingly, hybrid was not a preferred option among students at UL compared to in-class. The reason is probably not directly related to learning, but rather that most of the students enrolled at the UL are not from Ljubljana. In a blended setting, students would still be required to have an accommodation in Ljubljana and due to extremely high rental prices, students' accommodations are frequently very small and shared with other students making them inappropriate for remote learning.

Table 2 presents students' attitudes at the UL toward remote learning, Covid-19, and their implications on well-being and educational scores. The overall attitudes toward remote learning and Covid-19 measures tends to be negative. This is proven by the fact that 65.48% of students agreed or strongly agreed that remote teaching negatively influenced their engagement during lectures, 59.19% agreed or strongly agreed that remote teaching negatively influenced their knowledge acquisition during lectures and just 12.67% agreed or strongly agreed that remote teaching is as valid as in-class teaching for tertiary education. Students are also slightly less likely to ask questions remotely compared to face-to-face. In addition, they believed that the pandemic didn't play an important role in their transition to

31

remote. In fact, more students strongly disagreed (+5.86%) compared to those that strongly agreed that the pandemic made the transition more difficult. While 86.54% of students agreed or strongly agreed that their overall well-being would be better in a non-pandemic environment.

Table 2: Students' attitudes toward remote learning and the Covid-19 pandemic

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total	Mean
Remote learning SUITS me better than in-class learning	f	60	81	40	34	8	223	2.32
	f (%)	26.91%	36.32%	17.94%	15.25%	3.59%	100%	
Remote teaching NEGATIVELY influenced my ENGAGEMENT during lectures	f	8	31	38	92	54	223	3.69
	f (%)	3.59%	13.90%	17.04%	41.26%	24.22%	100%	
Remote teaching negatively influenced my KNOWLEDGE ACQUISITION during lectures	f	7	25	59	99	33	223	3.57
	f (%)	3.14%	11.21%	26.46%	44.39%	14.80%	100%	
My COURSES are more suitable for in-class teaching compared to remote teaching	f	10	28	46	80	59	223	3.67
	f (%)	4.48%	12.56%	20.63%	35.87%	26.46%	100%	
Remote teaching is as valid as in-class teaching for TERTIARY EDUCATION	f	37	87	69	20	8	221	2.43
	f (%)	16.74%	39.37%	31.22%	9.05%	3.62%	100%	
I am more likely to ASK QUESTIONS during in-class lectures compared to remote lectures	f	21	45	55	63	39	223	3.24
	f (%)	9.42%	20.18%	24.66%	28.25%	17.49%	100%	
In a non-pandemic environment, the TRANSITION TO REMOTE would be easier	f	21	56	81	56	8	222	2.88
	f (%)	9.46%	25.23%	36.49%	25.23%	3.60%	100%	

table continues

My OVERALL WELL-BEING would be better in a non-pandemic environment	f	0	10	20	68	125	223	4.38
	f (%)	0%	4.48%	8.97%	30.49%	56.05%	100%	

Source: Own work.

5.2 Main obstacles to the implementation of distance education

One of the biggest concerns from the institutional point of view in remote is cheating during exams. Table 3 shows that the vast majority of students believe that it is easier to cheat and that there is more cheating in remote compared to in-class exams at the UL. In fact, 62.78% of students agreed or strongly agreed that it is easier to cheat on remote compared to in-class while only 18.39% disagreed or strongly disagreed. We find very similar numbers to the question of whether there is more cheating on remote compared to in-class with 63.23% of students that agreed or strongly agreed and only 16.59% disagreed or strongly disagreed. Since the questions were answered by the actual students that are taking the exams, we can assume they answered based on their behavior and experience and as suspected by Antonio Rangel, without proper supervision, the test results are not showing the actual knowledge acquired during courses and lectures.

Table 3: Cheating during remote exams

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total	Mean
Remote exams are easier to CHEAT on compared to usual in-class exams	f	9	32	42	87	53	223	3.64
	f (%)	4.04%	14.35%	18.83%	39.01%	23.77%	100%	
There is more CHEATING during remote exams compared to the usual in-class exams	f	5	32	45	77	64	223	3.73
	f (%)	2.24%	14.35%	20.18%	34.53%	28.70%	100%	

Source: Own work.

Table 4 presents the commonly highlighted technical and physical issues during remote lectures for students enrolled at the UL. The most stressed issues for both undergraduate and graduate studies are eye strain, zoom fatigue, connectivity issues, and technical issues related to platforms, in this order. As expected, due to the lack of information and adaptation time to regular practices, undergraduate students faced in general more issues compared to graduate students, but both degree levels had whopping numbers. 94.66% of undergraduate and 84.78% of graduate students had some technical or physical issue because of remote courses. Only 5.34% of undergraduate and 15.22% of graduate students didn't experience any technical or physical issues because of remote learning.

Table 4: Technical issues and general physical issues divided per degree level related to the switch to remote

	Undergraduate studies		Graduate studies	
	f	f (%)	f	f (%)
Zoom fatigue	94	71.76%	50	54.34%
Eye strain	95	72.52%	63	68.48%
Connectivity issues	73	55.73%	39	42.39%
Lack of computer knowledge required	19	14.50%	4	4.35%
Lack of technology needed to study in remote	13	9.92%	6	6.52%
Technical issues related to platforms	59	45.04%	21	22.83%
Others	1	0.76%	1	1.09%
I did not experience any	7	5.34%	14	15.22%
Total respondents	131	100%	92	100%

Source: Own work.

Table 5 presents some of the distractions and technical issues that students are facing on remote and divided per average weekly frequencies. According to the results, 85.65% of students enrolled at the UL were at least sometimes exposed to a distracting study environment and 55.16% reported that at least once a week they were unable to actively follow the lectures. With 93.7%, voice delays and freezing screens were the most reported issues.

Table 5: Technical, environmental, and other issues that make studying in remote more difficult and frustrating

		Never	Less than once a week	Once a week	Twice a week	Three times a week	Four times a week	Every day	Total	Mean
Voice delays and freezing screens	f	14	46	34	49	25	25	30	223	2.15
	f (%)	6.30%	20.60%	15.20%	22.00%	11.20%	11.20%	13.50%	100%	
Roommates/family members distracting (too loud)	f	32	43	26	43	23	15	41	223	2.10
	f (%)	14.35%	19.28%	11.66%	19.28%	10.31%	6.73%	18.39%	100	
Complete inability to connect to zoom lecture	f	107	83	13	13	3	2	2	223	0.48
	f (%)	47.98%	37.22%	5.83%	5.83%	1.35%	0.90%	0.90%	100%	
Inability to upload homework and other materials	f	151	51	14	4	2	1	0	223	0.26
	f (%)	67.71%	22.87%	6.28%	1.79%	0.90%	0.45%	0%	100%	
Inability to actively follow the lectures	f	37	63	22	32	31	16	22	223	1.72
	f (%)	16.59%	28.25%	9.87%	14.35%	13.90%	7.17%	9.87%	100%	
Inability to turn on video or audio because of background	f	98	49	16	23	16	11	10	223	1.02
	f (%)	43.95%	21.97%	7.17%	10.31%	7.17%	4.93%	4.48%	100%	

Source: Own work.

Table 6: Professors' engagement and adaptation to remote courses

		Very disappointed	**Disappointed**	**Neither disappointed, nor satisfied**	**Satisfied**	**Very satisfied**	**Total**	**Mean**
PROFESSORS' PREPARATION for remote teaching	f	6	28	59	105	25	223	3.52
	f (%)	2.69%	12.56%	26.46%	47.09%	11.21%	100%	
MATERIALS UPLOADED by professors for remote teaching	f	9	21	38	121	34	223	3.67
	f (%)	4.04%	9.42%	17.04%	54.26%	15.25%	100%	
Professors' willingness to ADAPT AND ADJUST to student needs during the pandemic	f	10	42	47	95	29	223	3.41
	f (%)	4.48%	18.83%	21.08%	42.60%	13%	100%	

Source: Own work.

Another major concern of switching to remote was the transition of professors and their adaptability to the new setting. Professors' preparation for remote teaching, their willingness to adapt and adjust to students' needs during the pandemic, and the materials uploaded by professors for remote teaching were crucial for a smooth transition and for which the expectations of students' responses were not very high. This was mainly due to the lack of time for the preparation of remote teaching. Table 6 presents the students' perception of professors' engagement and adaptation to remote education. For all three questions, there is a positive attitude with over 55% of satisfied or very satisfied respondents and less than 5% very disappointed. From the survey conducted on students enrolled at the UL, we can confirm that students at the UL are not able to study as effectively in remote or at least that they are not pleased with the remote setting (see table 12: Students' attitudes toward remote learning and the Covid-19 pandemic), but in contrast to the SERU Covid-19 Survey, students at the UL have a positive attitude toward course contents.

The following three tables will present the same issues reported by the respondents during remote learning, but the responses are divided based on degree levels, housing situation, and family income of the respondents. Regardless of the division, the lack of motivation was the most cited issue, followed by a distracting environment.

Table 7 presents the main learning issues experienced by the students at the UL. Similar to what was found by Soria, Chirikov & Jones-White (2020), most of the students had some sort of learning issues during the pandemic in remote. 98.47% of undergraduate students and 95.65% of graduate students experienced some issues with studying remotely. For both undergraduate and graduate students, the main issue reported was the lack of motivation, followed by a distracting environment, time management issues, and lack of moral support.

Table 7: Learning issues compared between undergraduate and graduate students during the COVID-19 pandemic

	Undergraduate studies		Graduate studies	
	f	f (%)	f	f (%)
Time management issues.	73	55.73%	40	43.48%
Lack of motivation.	122	93.13%	73	79.35%
Lack of moral support (lack of a supporting environment)	52	39.69%	28	30.43%
Distracting environment (continuous external stimuli that make it hard to focus)	91	69.47%	52	56.52%

Others	2	1.53%	2	2.17%
I did not experience any	2	1.53%	4	4.35%
Total	131	100%	92	100%

Source: Own work.

5.3   Differences based on housing situation and economic status

Table 8 presents the same learning issues as Table 7 with the difference that students are divided based on their housing situation. Interestingly, students that lived in apartments experienced more moral support compared to students that lived at home or in student dorms and have on average a less distracting environment.

Table 8: Learning issues compared between students in different housing situations during the Covid-19 pandemic

	Living in an apartment		Living at home		Living in a dorm	
	f	f (%)	f	f (%)	f	f (%)
Time management issues.	10	38.46%	70	50.36%	33	53.23%
Lack of motivation	21	80.77%	118	84.89%	56	90.32%
Lack of moral support (lack of a supporting environment)	2	7.69%	47	33.81%	31	50%
Distracting environment (continuous external stimuli that make it hard to focus)	11	42.31%	92	66.19%	40	64.52%
Others	1	4%	2	1.44%	1	1.61%
I did not experience any	0	0%	4	2.88%	2	3.23%
Total	26	100%	139	100%	62	100%

Source: Own work.

Table 9 presents the same learning issues as Table 7 and Table 8 with the difference that students are divided based on their family income level. There are no major differences in learning issues among students from all three income groups. Lack of moral support and the

distracting environment was expected to be higher for the low-income group compared to other groups, however, the percentage is even lower compared to the middle-income group.

Table 9: Learning issues compared between students from different economic backgrounds during the Covid-19 pandemic

	<850 eur		851-2500 eur		>2501 eur	
	f	f (%)	f	f (%)	f	f (%)
Time management issues	44	52.38%	55	50.93%	14	45.16%
Lack of motivation	74	88.10%	92	85.19%	29	93.55%
Lack of moral support (lack of a supporting environment)	26	30.95%	47	43.52%	7	22.58%
Distracting environment (continuous external stimuli that make it hard to focus)	52	61.90%	73	67.59%	18	58.06%
Others	4	4.76%	0	0%	0	0%
I did not experience any	3	3.57%	3	2.78%	0	0%
Total	84	100%	108	100%	31	100%

Source: Own work.

5.4 Impact of remote learning on students' engagement and knowledge acquisition

To measure the impact of remote learning, respondents were asked to assess if their time invested for educational purposes, attendance at lectures, and average grade points have increased, stayed the same, or reduced.

Table 10 presents the comparison between undergraduate and graduate students in a fluctuation of time invested for educational purposes. There was no significant difference between the degree studies (p=0.458). Both groups reported similar results. Undergraduate students reported a slightly higher percentage of reduced time invested in education (+5.77%), while graduate students reported a slightly higher percentage of invariant time spent on education (+7.21%).

Table 10: Comparison of levels of studies in the fluctuation of time invested for education

		Your estimated time invested for education purposes has			Total	χ²	p
		Reduced	**Stayed the same**	**Increased**			
Undergraduate studies	f	36	30	58	124	1.628	0.458
	f (%)	29.03%	24.19%	46.77%	100%		
Graduate studies	f	20	27	39	86		
	f (%)	23.26%	31.40%	45.35%	100%		
Total	f	56	57	97	210		
	f (%)	26.67%	27.14%	46.19%	100%		

Abbreviations. f-frequency, χ²- statistic, p-statistical significance.

Source: Own work.

Table 11 presents the comparison between undergraduate and graduate students in a fluctuation of class attendance. There was only a borderline difference between undergraduate and graduate students in a fluctuation of lecture attendance (p=0.051). A higher percentage of graduate students increased attendance to remote lectures compared to undergraduate students (+13.77%), however, the majority of both student groups reported that their lecture attendance stayed the same. Aggregate data shows us that Bao's (2020) prediction, that students' propensity to skip class increases in remote, was correct since more students reported a decrease compared to those that reported an increase in lecture attendance (+10.5%).

Table 11: Comparison of levels of studies in the fluctuation of class attendance

		Do you think that your attendance at lectures has			Total	χ²	P
		Reduced	**Stayed the same**	**Increased**			
Undergraduate studies	f	49	58	23	130	5.956	0.051
	f (%)	37.69%	44.62%	17.69%	100%		
Graduate studies	f	25	36	28	89		
	f (%)	28.09%	40.45%	31.46%	100%		
Total	f	74	94	51	219		
	f (%)	33.79%	42.92%	23.29%	100%		

Abbreviations. f-frequency, χ²- statistic, p-statistical significance.

Source: Own work.

Table 12 presents the comparison between undergraduate and graduate student and their average grade change. There was no significant difference between undergraduate and graduate students in the change in the average grade (p=0.949). More undergraduate students (+13.71%), as well as graduate students (+9.52%), reported an average grade point increase compared to those that reported a drop. The majority of undergraduate and graduate students reported that their average grade points stayed the same during the Covid-19 pandemic.

Table 12: Comparison of levels of studies in changes of average grade

| | | You think your average grade point has | | | Total | χ^2 | P |
		Reduced	Stayed the same	Increased			
Undergraduate studies	f	26	55	43	124	0.167	0.949
	f (%)	20.97%	44.35%	34.68%	100%		
Graduate studies	f	19	38	27	84		
	f (%)	22.62%	45.24%	32.14%	100%		
Total	f	45	93	70	208		
	f (%)	21.63%	44.71%	33.65%	100%		

Abbreviations. f-frequency, χ^2- statistic, p-statistical significance.

Source: Own work.

5.5   Income inequalities

According to The Organisation for Economic Co-operation and Development (OECD), Slovenia has one of the lowest Gini coefficients and is as such one of the world countries with the lowest income inequality (OECD, no date). One of the possible explanations for students in Slovenia not being as affected by income inequalities compared to foreign studies is that the smaller income inequalities in Slovenia are also reflected in the smaller differences observed between students from different income groups compared to other foreign studies. A potential factor that was excluded, due to the well-divided income, is that the low-income level students are not applying to tertiary education programs. In addition, Slovene Universities are government-owned and mostly funded by the Ministry of Education, Science, and Sport. Also important to mention is that the Slovene government supports financially all students based on their financial status. This is not only preventing bottlenecks in the transition from high school to university but also incentivizing students to pursue a tertiary education by keeping university fees extremely low compared to foreign institutions, providing scholarships for low-income students, affordable student dorms, living contributions, partly state-funded meals, etc.

Table 13 present the comparison between monthly income categories in limitations of remote learning. There were no significant differences between the three monthly income categories in the frequency of roommates or family distractions during remote learning (p=0.110) and the inability to turn on video or audio due to background (p=0.606). All income groups reported a similar frequency of weekly distraction caused by the household members (2-3 times per week). The participants in all income groups had less frequent problems with video or audio due to the background.

Table 13: Comparison between monthly income categories in limitations of remote learning

	Family income per month in EUR	N	Median	Q1	Q3	χ^2	p
Roommates/family members distracting (too loud)	<850 EUR	84	3	2	5	4.419	0.11
	851-2500 EUR	108	4	2	6		
	>2501 EUR	31	4	2	5		
Inability to turn on video or audio because of background	<850 EUR	84	2	1	4	1.000	0.606
	851-2500 EUR	108	2	1	3		
	>2501 EUR	31	2	1	5		

Abbreviations. Q1/3-first and third quartile, χ^2- statistic, p-statistical significance.

Source: Own work.

Table 14 presents the socio-economic issues experienced by students from different economic backgrounds. The reduction of personal incomes was the most prevalent socio-economic issue in all groups. Housing insecurity was the second most stressed issue in all groups, while for the lowest income group increasing expenses had the same number of matches as housing insecurities (26.19%). As expected, the higher the income level the lower the probability to experience socioeconomic issues, but the differences are not substantial.

Table 14: Comparison between students from different economic backgrounds and the socio-economic issues experienced during the Covid-19 pandemic

	<850 eur		851-2500 eur		>2501 eur	
	f	f (%)	f	f (%)	f	f (%)
Housing insecurity	22	26.19%	32	29.63%	9	29.03%
Food insecurity	5	5.95%	8	7.41%	1	3.23%

Unemployment of family members	20	23.81%	20	18.52%	1	3.23%
Reduction of personal incomes	46	54.76%	52	48.15%	12	38.71%
Increasing expenses	22	26.19%	16	14.81%	2	6.45%
Relatives you had to take care of	3	3.57%	19	17.59%	5	16.13%
Others	1	1.19%	0	0%	2	6.45%
I did not experience any	23	27.38%	35	32.41%	11	35.48%
Total	84	100%	108	100%	31	100%

Source: Own work.

5.6   Future outlook of remote learning

The pandemic has calmed down due to the use of vaccines and the milder variants of Covid (Bunn, 2022), but making predictions about the post-pandemic future is still challenging. Even though the Covid-19 pandemic is likely to result in more people working and learning remotely in the future (OECD, 2021). For many, the pandemic was forced but it also brought many positive opportunities such as a temporary decrease in greenhouse gas emissions, better work-life or study-life balance, and cost savings (OECD, 2021).

Students that have access to sufficient infrastructure in their hometown or village may not be forced to commute to or move into larger cities anymore which until the Covid-19 pandemic provided better options for good education and employment, but also higher costs of living. It is very important to stress the importance that remote was applied to the business world as well and that 30% of the surveyed students have a part-time or full-time job[1]. This setting would ensure better opportunities for teenagers from rural areas and create a fairer environment compared to the past, especially for those that come from lower socio-economic families and/or don't want to abandon their community.

On one hand, a complete lockdown due to Covid-19 is very unlikely, at least not for such extended periods as it happened between 2020 and 2021 so that students would not be able to have at least part of the courses or exams in classes, but on the other hand, students enrolled at the UL would rather see remote to remain part of tertiary education even after the pandemic. The most probable setting for the upcoming years is optional or hybrid because

---

[1] 12% lost their job due to the pandemic, 21% are doing seasonal jobs and 37% reported that they are not working (Source: Own work).

of the uncertainties related to the development of the pandemic. Switching completely back to in-class would be a huge risk. It would have a negative impact on the pandemic which is not yet fully under control and reckless because it would also harm students who have just adapted to the current setting. So, we can expect a very flexible setting in which institutions and professors decide to switch from some to none courses in classes based on course specifics, students' and professors' needs and preferences, health situation within the country borders and abroad, physical and technical infrastructure availability, number of enrollments, governmental recommendations and measures, etc.

The pandemic has reshaped the educational model and had consequently an enormous impact on the future outlook of tertiary education. As this master thesis showed, remote learning is a very useful and appreciated learning method, but not on its own. Students would rather see it in a blended version with in-class courses. The ability of faculties to adapt and implement innovations will play a key role in the life span of remote learning in tertiary education.

According to the official data from the UL (Univerza v Ljubljani, no date a), the number of enrolled students increased from 37,615 in the school year 2019-2020 to 40,607 in the school year 2020-2021, which is a 7.95% increase. This is especially interesting when compared to the data from SURS, the statistical office of the Republic of Slovenia, according to which there was a decreasing tendency of enrolled tertiary students in Slovenia for nine years in a row (Sever, 2019). In fact, there were 75,991 enrollments during the school year 2018/2019 which is 0.7% less compared to the previous year 2017/2018 (76,534) and 34.2% less (115,445) compared to ten years before (Sever, 2019).

Also, the dropout rate doesn't seem to be an issue at the UL. Despite the consensus that the Covid-19 pandemic initially had a detrimental effect on students' finances and mental health, statistics from UL show a greater retention rate. The higher number of enrolled students for the school year 2020/2021 is a combination of an increased number of new enrollments at the UL 14,912, compared to 14,287 for the school year 2019/2020 and 14,319 for 2018/2019, and an increased number of retained students, 25,695 for the school year 2020/2021 compared to 23,382 for 2019/2020 and 23,555 for 2018/2019 (Univerza v Ljubljani, no date a). Unfortunately, the number of graduating students in the year 2020, 7,786, decreased by 5.78% compared to the year 2019, 8,264 (Univerza v Ljubljani, no date a) which suggests a negative impact on the students' output rate at the UL as observed for OUs. However, the average student profile enrolled in an OU or a regular full-time tertiary program differs in many aspects. This limits the forecasting of future dropout and output rates because of remote learning and the coronavirus, by comparing data from students enrolled in the UL and OUs.

5.7   Limitations and avenues for further research

This master thesis can be seen as a starting point for future research about remote learning, its effectiveness, and its suitability for tertiary education at UL. The very first limitation is the absence of similar research done by or for the UL. However, a lot of research has been done about remote education during the pandemic and more and more materials will be available with time. Also, the absence of similar data from this area done before the pandemic, means that the population cannot be compared in two different settings. So, it was only possible to confront data with foreign studies that have done pre-pandemic data collection.

For future research related to testing engagement and knowledge acquisition, I would consider post-traumatic stress as an important factor that will influence future student generations, especially for students from marginalized groups. Even if the UL would switch back to the pre-pandemic in-class model, especially data about the general health and well-being of students who experienced Covid-19 or witnessed illness, deaths, anxiety, depression, etc. would be negatively affected for months, maybe years. On the contrary, for some students, the end of the pandemic and the abolishment of the restrictions may result in better overall well-being and appreciation of freedom and education differently than before.

A limitation of the survey instrument was that my limited knowledge about education, social status, social capital, social ties, psychology, pandemics, etc. could have led to biased or ambiguous questions and unconsciously influenced the results of the questionnaire. Using pre-validated scales and comparing instruments used in different studies could improve the validity of the scales. Regarding the questions included, even though the questionnaire was very long with its 26 questions, additional data about time perception during the lockdown and in general on remote would be very helpful to better understand perceptual and cognitive processes among students at the UL.

Regarding the sample, a further limitation is the language of the questionnaire which was in English. In order to reach non-Slovene-speaking students, it might have created language barriers for Slovene students that are not fluent in English and didn't fully understand the questions. This barrier might have resulted in unfinished questionnaires and/or wrongly answered questions. With this concern in mind, I have decided to remove the unfinished questionnaires during the data analysis. The vast majority of the respondents reported an extremely low household income which suggests that they didn't understand correctly the question regarding their family income. A bilingual questionnaire would on one hand incentivize Slovene students to start and finish the survey, and on the other help to include Erasmus and foreign students. The main concern of having two separate questionnaires was that the differences in the Slovene and English language could produce a different understanding of the questions and significant deviations in responses.

Further, because of the pandemic, data collection was limited to remote options. In order to make the questionnaire more accessible and gather as many respondents as possible to recreate the population in the best possible way, it was freely accessible online. The respondents had unlimited time and were allowed to go back and change their answers during the questionnaire. Later questions could have stimulated further thinking and influenced past answers, especially because of the questionnaire's length.

Additionally, a separate questionnaire for professors would be needed to fully understand how knowledge acquisition and engagement changed among students during the pandemic. This would give a different perspective and provide a better understanding of remote education at the UL during the pandemic.

To better understand the implications of remote learning and factors influencing the well-being as well as focus, knowledge acquisition, engagement, etc. at the UL more future studies are required.

CONCLUSION

Covid-19 brought new challenges for everyone. From professors and institutions to students and families, everyone had to face their own challenges during lockdowns besides the social, mental, and financial issues that arose with the pandemic and the imposed measures by governments all around the world. It forced tertiary education to switch to remote learning and the UL to rethink the usual in-class teaching. And as this study showed, remote teaching is not a particularly effective and prized method for tertiary education at the UL as well as abroad, but in combination with in-class teaching, it could be helpful to tackle modern issues of educational systems. Depending on faculties, courses, and topics, professors could use the knowledge and infrastructure built during the pandemic to ease the recent issues of in-class teaching such as overscheduling of students and professors and overcrowded classes. Remote teaching could be a solution for faculties that are facing increasing numbers of enrollments, without the need of expanding the physical infrastructure.

In-class teaching is effective as long as the classes are of a reasonable size. Microphones that are not properly working, speakers making strange sounds or absence of audio tools, colleagues chatting and distracting, and not enough seats and desks available are just some of the reasons that made overcrowded in-class teaching less effective. Issues that we have to remember if tertiary education is planning to switch back to in-class teaching.

MOOCs like Coursera already have countless educational programs which could benefit many students and the UL has the infrastructure and personnel to tackle the cheating issues around the current identification methods and cheating prevention.

Traumatic events such as the Covid-19 pandemic require a very responsive institution that can ensure a smooth transition from one teaching method to another. Even though professors,

as well as faculties, should consider the fact that many students are not able to focus properly on learning during stressful events or ill-being, it should not affect the passing standards and adapt by reducing the learning materials or making the exams easier. The fact that at the UL student retention has increased while the number of graduated students has decreased and that students enrolled at the UL admitted the increasing cheating in remote, suggests that remote learning during the pandemic has negatively affected knowledge acquisition and faculty standards.

The purpose of this master's thesis was to provide the UL and readers with a comprehensive insight into the effects of remote teaching on student learning and engagement at the UL.

Based on the survey conducted on 223 individuals, I found that students enrolled at the UL during the Covid-19 pandemic prefer in-class compared to remote teaching. Even though students were in general satisfied with remote teaching, they would rather not continue with remote tertiary education as proposed during the pandemic. The preferred alternative was optional, allowing students to decide whether to participate in person or virtually. As confirmed by students, cheating during exams is a significant issue remotely. Most students also stressed that they experienced various technical, physical, environmental, socioeconomic, and other issues that arose because of remote education and the Covid-19 pandemic. Despite the limited amount of time to prepare for remote teaching, students were satisfied with the preparation, materials, and flexibility of their lecturers. Additionally, they reported that they invested more time for educational purposes in remote compared to in-class while for the majority their average grade point and attendance remained the same.

In conclusion, we can say that remote learning is not the perfect solution that fits all students and faculties. The hypothesis that the biggest issues in remote arose due to the pandemic and not the remote setting itself was rejected by students, but at the same time, most students reported that their overall well-being would be better in a non-pandemic environment and well-being is highly important during transition periods. Even though slovene education was not prepared and was forced from one day to another to adapt, students, in general, are satisfied and would like to retain remote learning in a blended version besides regular in-class teaching.

REFERENCE LIST

1. Adams, S. (2012, 17 July). *Is coursera the beginning of the end for traditional higher education?*. Retrieved on June 12, 2021 from https://www.forbes.com/sites/susanadams/2012/07/17/is-coursera-the-beginning-of-the-end-for-traditional-higher-education/?sh=778305e412ae

2. Andrade, H. & Du, Y. (2007). Student responses to criteria-referenced self-assessment. *Assessment & Evaluation in Higher Education*, *32*(2), 159–181.

3. Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies*, *2*(2), 113–115.

4. Bartlett, T. & Schugurensky, D. (2020). Deschooling Society 50 Years Later: Revisiting Ivan Illich in the Era of COVID-19. *Sisyphus*, *8*(3) 65–84.

5. Bauer, J., Brooks, C., & Hampton, K. (2020). *Poor internet connection leaves rural students behind*. Retrieved on October 22, 2021 from https://msutoday.msu.edu/news/2020/poor-internet-connection-leaves-rural-students-behind

6. Berge, Z. L. (2008). Changing instructor's roles in virtual worlds. *Quarterly Review of Distance Education*, *9*(4), 407–414.

7. Blanden, J., Gregg, P. & Macmillan, L. (2013). Intergenerational persistence in income and social class: the effect of within-group inequality. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *176*(2), 541–563.

8. Browmana, A. S., Destina, M., Carswelld, K. L. & Svobodab, R. C. (2017). Perceptions of socioeconomic mobility influence academic persistence among low socioeconomic status students. *Journal of Experimental Social Psychology*, *75*, 45–52.

9. Bunn, S. (2022, 07 March). *COVID-19: Omicron, recent developments, and the likely impact of future variants on the pandemic.* Retrieved on May 04, 2022 from https://post.parliament.uk/covid-19-omicron-recent-developments-and-the-likely-impact-of-future-variants-on-the-pandemic/

10. Burbules, N. C. (2012). Ubiquitous learning and the future of teaching. *Encounters in Theory and History of Education, 13* (3), 3–14.

11. Chatti, M. A., Agustiawan, M. R., Jarke, M. & Specht, M. (2010). Toward a personal Learning Environment Framework. *International Journal of Virtual and Personal Learning Environments, 1*(4), 66–85.

12. Chatti, M. A., Jarke, M., & Frosch-Wilke, D. (2007). The future of elearning: A shift to knowledge networking and social software. *International Journal of Knowledge and Learning*, *3*(4/5), 404–420.

13. Chirikov, I., Soria, K. M., Horgos, B. & Jones-White, D. (2020). *Undergraduate and graduate students' mental health during the COVID-19 pandemic.* Berkeley: Center for Studies in Higher Education, UC Berkeley.

14. Christian, T. J. (2012). Trade-offs between commuting time and health-related activities. *Journal of urban health*, *89*(5), 746–757

15. Cole, S.F., O'Brien, J.G., Gadd, M. G., Ristuccia, J., Wallace, D. L. & Gregory, M. (2005). *Helping traumatized children learn: Supportive school environments*. Boston: Massachusetts Advocates for Children.

16. Cotton, S. J., Dollard, M. F., & De Jonge, J. (2002). Stress and student job design: Satisfaction, well-being, and performance in university students. *International Journal of Stress Management, 9*(3), 147–162.

17. Coursera (no date). *Our vision*. Retrieved on June 12, 2021 from https://about.coursera.org/

18. Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects, 49,* 91–96.

19. Doykov, I., Hällqvist, J., Gilmour, K. C., Grandjean, L., Mills, K., & Heywood, W. E. (2020). *'The long tail of Covid-19'-The detection of a prolonged inflammatory response after a SARS-CoV-2 infection in asymptomatic and mildly affected patients* (2nd edition). Swansea: Swansea University.

20. Friedman, L. T. (2012, 16 May). *Come the revolution.* Retrieved on August 15, 2021 from https://www.nytimes.com/2012/05/16/opinion/friedman-come-the-revolution.html

21. Gimenez-Nadal, J. I., & Molina, J. A. (2019). Daily feelings of US workers and commuting time. *Journal of Transport & Health, 12,* 21–33.

22. Grimard, A. & Maddaus, J. (2004). Overcoming Obstacles to Preparing for College. *The Rural Educator*, *25*(3), 30–37.

23. Hobbs, T. D., & Hawkins, L. (2020, 5 June). *The results are in for remote learning: It didn't work.* Retrieved on August 14, 2021 from https://www.wsj.com/articles/schools-coronavirus-remote-learning-lockdown-tech-11591375078

24. Hughes, R. & Perry-Jenkins M. (1996). Social Class Issues in Family Life Education. *Family Relations, 45*(2), 175–182.

25. Hunter, P. (2019). Remote working in research: An increasing usage of flexible work arrangements can improve productivity and creativity. *Embo Reports*, *20*(1), p. 1–4.

26. IgnouHelp (2021, 10 September). *IGNOU – Indira Gandhi National Open University*. Retrieved on November 21 2021 from http://www.ignouhelp.in/ignou/

27. Jiang, M. (2020, 22 April). *The reason Zoom calls drain your energy*. Retrieved on September 05, 2021 from https://www.bbc.com/worklife/article/20200421-why-zoom-video-chats-are-so-exhausting

28. Kakuchi, S. (2021, 10 March). *Student dropout rate on the rise due to pandemic impact.* Retrieved on August 12, 2021 from https://www.universityworldnews.com/post.php?story=2021031006383627

29. Kamenarič, K. (2018, 2 February). *Če študent za stroške študija nima denarja, fakultete žal ne more dokončati.* Retrieved on July 03, 2022 from:

https://siol.net/novice/slovenija/ce-student-za-stroske-studija-nima-denarja-fakultete-zal-ne-more-dokoncati-458170

30. Kanafina, A. (2022). *Analysis of the Effect of Covid-19 Pandemic on Education Technology in Kazakhstan.* Vilnius: Mykolo Romerio universitetas.

31. Kohn, M. L., Scotch, N. A. & Glick, I. D. (1979). *The effects of social class on parental values and practices* (The American family, 45–77). Boston: Springer.

32. Lechner, W. V., Laurene, K. R., Patel, S., Anderson, M., Grega, C., & Kenne, D. R. (2020). Changes in alcohol use as a function of psychological distress and social support following COVID-19 related University closings. *Addictive behaviors*, *110.*

33. Leslie, I. (2020, 3 July). *Why your 'weak-tie' friendships may mean more than you think.* Retrieved on June 15, 2021 from https://www.bbc.com/worklife/article/20200701-why-your-weak-tie-friendships-may-mean-more-than-you-think

34. Lewin, T. (2012, 17 July). *Universities reshaping education on the web*. Retrieved on October 7, 2021 from https://www.nytimes.com/2012/07/17/education/consortium-of-colleges-takes-online-education-to-new-level.html

35. Long, E., Patterson, S., Maxwell, K., Blake, C., Pérez, R. B., Lewis, R., McCann, M., Riddell, J., Skivington, K., Wilson-Lowe& Mitchell, K. R. (2022). COVID-19 pandemic and its impact on social relationships and health. *Journal of Epidemiol Community Health, 76*(2), 128–132.

36. López, G., Quesada, L., & Guerrero, L. A. (2017). Alexa vs. Siri vs. Cortana vs. Google Assistant: a comparison of speech-based natural user interfaces. *International Conference on Applied Human Factors and Ergonomics*, *592*, 241–250.

37. Marelli, S., Castelnuovo, A., Somma, A., Castronovo, V., Mombelli, S., Bottoni, D. & Ferini-Strambi, L. (2020). Impact of COVID-19 lockdown on sleep quality in university students and administration staff. *Journal of Neurology*, *267*(7), 1–8.

38. Michigan Medicine: University of Michigan, Department of Psychiatry (no date). *Posttraumatic Stress Disorder during COVID-19.* Retrieved on September 19, 2021 from https://medicine.umich.edu/dept/psychiatry/michigan-psychiatry-resources-covid-19/specific-mental-health-conditions/posttraumatic-stress-disorder-during-covid-19.

39. Mikulecký, P. (2012). Smart Environments for Smart Learning. *DIVAI 2012 9th International Scientific Conference on Distance Learning in Applied Informatics,* 213–222.

40. Mishra, S. (2017). *Open universities in the Commonwealth: At a glance*. Burnaby, BC: Commonwealth of Learning.

41. Moschetti R.V. & Hudley C. (2015). Social Capital and Academic Motivation Among First-Generation Community College Students. *Community College Journal of Research and Practice*, *39*(3), 235–251.

42. Nadler, R. (2020). Understanding "Zoom fatigue": Theorizing spatial dynamics as third skins in computer-mediated communication. *Computers and Composition, 58*.

43. Ogden, R. S. (2020). The passage of time during the UK Covid-19 lockdown. *Plos one, 15*(7), 1–16.

44. Organisation for Economic Co-operation and Develop (2021, 22 June). *Implications of Remote Working Adoption on Place Based Policies: A Focus on G7 Countries*. Retrieved on May 28, 2022 from https://www.oecd.org/cfe/implications-of-remote-working-adoption-on-place-based-policies-b12f6b85-en.htm

45. Organisation for Economic Co-operation and Develop (no date). *Income inequality (indicator)*. Retrieved on January 19, 2022 from https://www.oecd-ilibrary.org/social-issues-migration-health/income-inequality/indicator/english_459aa7f1-en

46. Patel, J. A., Nielsen, F. B. H., Badiani, A. A., Assi, S., Unadkat, V. A., Patel, B., Ravindrane, R. & Wardle, H. (2020). Poverty, inequality and COVID-19: the forgotten vulnerable. *Public health*, *183*, 110.

47. Pretti, T. J., Etmanski, B., & Durston, A. (2020). Remote work-integrated learning experiences: Student perceptions. *International Journal of Work-Integrated Learning*, *21*(4), 401–414.

48. Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the COVID-19 pandemic. *Cureus*, *12*(7).

49. Saikat, S., Dhillon, J. S., Wan Ahmad, W. F., & Jamaluddin, R. A. D. (2021). A systematic review of the benefits and challenges of mobile learning during the COVID-19 pandemic. *Education Sciences, 11*(9), 459.

50. Sever, M. (2019). *V študijskem letu 2018/19 je v terciarno izobraževanje vpisanih 75.991 študentov, 0,7 % manj kot v letu pred tem.* Ljubljana: Statistični Urad Republike Slovenije.

51. Sezgin, S. (2020). Teacher education MOOCs: Re-thinking professional development of teachers according to the MOOC experiences of preservice teachers and teacher trainers. *Ilkogretim Online*, *19*(4), 2484–2502.

52. Shamir-Inbal, T., & Blau, I. (2021). Facilitating emergency remote K-12 teaching in computing-enhanced virtual learning environments during COVID-19 pandemic-blessing or curse?. *Journal of Educational Computing Research*, *59*(7), 1243–1271.

53. Shim, T. E., & Lee, S. Y. (2020). College students' experience of emergency remote teaching due to COVID-19. *Children and youth services review, 119.*

54. Sitzmann, T., Kraiger, K., Stewart, D. & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. *Personnel psychology*, *59*(3), 623–664.

55. Smyth, J. M., Hockemeyer, J. R., Heron, K. E., Wonderlich, S. A., & Pennebaker, J. W. (2008). Prevalence, type, disclosure, and severity of adverse life events in college students. *Journal of American College Health*, *57*(1), 69–76.

56. Soria, K. M., Chirikov, I. & Jones-White, D. (2020). *The obstacles to remote learning for undergraduate, graduate, and professional students.* Berkeley: Center for Studies in Higher Education, UC Berkeley.

57. Soria, K. M., & Horgos, B. (2020). *Social class differences in students' experiences during the COVID-19 pandemic.* Berkeley: Center for Studies in Higher Education, UC Berkeley.

58. Soria, K. M., Horgos, B., Chirikov, I., & Jones-White, D. (2020). First-generation students' experiences during the COVID-19 pandemic. Berkeley: Center for Studies in Higher Education, UC Berkeley.

59. Soria, K. M., Horgos, B., Jones-White, D. & Chirikov, I. (2020). *Undergraduate and graduatestudents' food insecurity during the COVID-19 pandemic.* Berkeley: Center for Studies in Higher Education, UC Berkeley.

60. Statistics Canada. (2010, January). *Cities and Growth: Earnings Levels Across Urban and Rural Areas: The Role of Human Capital.* Retrieved on November 20, 2021 from: https://www150.statcan.gc.ca/n1/pub/11-622-m/2010020/part-partie1-eng.htm#h2_4

61. Študentski dom Ljubljana (no date). *Cena študentskih domov ljubljana.* Retrieved on July 03, 2022 from: https://www.stud-dom-lj.si/o-nas/faq/pogosta-vprasanja-lokacije-in-ceniki/

62. Tait, A. (2018a). Education for development: From distance to open education. *Journal of Learning for Development*, *5*(2), 101–115.

63. Tait, A. (2018b). Open universities: The next phase. *Asian Association of Open Universities Journal*, *13*(1), 13–23.

64. Townsley, M. (2020). Grading Principles in Pandemic-Era Learning: Recommendations and Implications for Secondary School Leaders. *Journal of School Administration Research and Development*, *5*(S1), 8–14.

65. Univerza v Ljubljani (no date, a). Univerza v številkah. Retrieved on February 20, 2022 from: https://www.uni-lj.si/o_univerzi_v_ljubljani/univerza_v_stevilkah/

66. Univerza v Ljubljani (no date, b). Cenik storitev za študente. Retrieved on July 03, 2022 from: https://www.uni-lj.si/studij/cenik-storitev/

67. Urad vlade za komuniciranje (2020, 12 March). *Slovenija razglasila epidemijo novega koronavirusa*. Retrieved on October 28, 2020 from: https://www.gov.si/novice/2020-03-12-slovenija-razglasila-epidemijo-novega-koronavirusa/

68. Vintere, A., Aruvee, E., & Rimkuviene, D. (2021). Challenges and benefits of remote learning in context of competence development of engineeri1ng students during Covid-19 pandemic. *Engineering For Rural Development, 9,* 10.

69. Vollbrecht, P. J., Porter-Stransky, K. A. & Lackey-Cornelison, W. L. (2020). Lessons learned while creating an effective emergency remote learning environment for students during the COVID-19 pandemic. *Advances in Physiology Education*, *44*(4), 722–725.

70. Weis, L. & Dolby, N. (2012). *Social Class and Education: Global Perspectives*. New York: Routledge.

71. Wolpow, R., Johnson, M. M., & Hertel, R. (2009). *The heart of learning and teaching*. Olympia, WA: Office of Superintendent of Public Instruction (OSPI) Compassionate Schools.

72. Zavec, B. (2021). *Cene stanovanjskih nepremičnin v 2. četrtletju 2021 znova višje*. Ljubljana: SURS.

APPENDICES

Appendix 1: Povzetek (Summary in Slovene language)

Od profesorjev in institucij do študentov in družin, vsak se je moral med pandemijo koronavirusne bolezni soočiti z novimi izzivi. Prav tako se je zgodilo izobraževalnim inštitucijam, ki so morale izobraževanje v učilnicah fakultet premestit na daljavo.

Od izbruha pandemije se je veliko raziskav osredotočilo na učinke učenja na daljavo. Na eni strani so študentje navedli prednosti učenja na daljavo, kot so fleksibilnost, izboljšana produktivnost, samostojnost, na drugi strani slabosti kot so nizka socialna povezanost in komunikacija, moteče okolje, povečana utrujenost in pomankanje tehnične infrastrukture.

Na podlagi ankete, opravljene na 223 posameznikih, sem ugotovil, da študentje imajo raje pouk v učilnicah kot na daljavo. Čeprav so bili študentje z izvedbo poučevanjem na daljavo med pandemijo Covid-19 zadovoljni, si izključnega učenja na daljavo ne želijo. Raziskava je pokazala, da poučevanje na daljavo ni posebej učinkovita in cenjena metoda na UL kot tudi ne v tujini. Vseeno so študentje izrazili željo, da se ohrani izobraževanje na daljavo v kombinaciji s poučevanjem v učilnicah, saj obe metodi imata dobre in slabe lastnosti in vsak študent ima drugačne potrebe kot tudi želje. Najraje bi se študentje sami odločali ali se bodo predavanj udeleževali osebno ali virtualno. Večina študentov je tudi poudarila, da so se soočali z različnimi tehničnimi, fizičnimi, okolijskimi, socialno-ekonomskimi in drugimi težavami, ki so se pojavile zaradi izobraževanja na daljavo in pandemije Covid-19. Kljub omejenemu času, ki so ga imeli profesorji na razpolago za pripravo predavanj na daljavo, so bili študentje zadovoljni s pripravo, snovjo in prilagodljivostjo predavateljev. Poleg tega so študentje poročali, da so v izobraževalne namene vložili več časa za učenje na daljavo kot so pred tem v učilnicah, medtem ko je pri večini anketirancev povprečna ocena in prisotnost ostala nespremenjena.

Magistrska naloga je sestavljena iz empiričnega dela in sekundarnih virov, ki predstavlja osnovo za primarne raziskave. Primarni podatki za analizo so bili zbrani s pomočjo spletnega orodja 1ka. Vprašalnik je sestavljen iz 26 vprašanj, razdeljivih v 6 sklopov in dodatna uvodna stran. Upoštevanih je bilo 223 v celoti dokončanih odgovorov.

Glede na potrebe fakultet, predmetov in obravnavanih tematik, bodo morali profesorji uporabiti znanje in infrastrukturo zgrajeno med pandemijo, da bodo rešili težave poučevanja v živo, kot sta na primer preobremenjeni urniki študentov in profesorjev ter prenatrpanost učilnic. Učenje na daljavo bi lahko bila rešitev UL za spopadanje z naraščajočim številom vpisanih študentov rednih programov, ne da bi investirali v dodatno fizično infrastrukturo, saj so poučevanja v razredih učinkovita, če so razredi primerne velikosti. Prenatrpane učilnice, mikrofoni, ki ne delujejo pravilno, zvočniki, ki oddajajo nenavadne zvoke ali odsotnost zvočnih orodij, kolegi, ki klepetajo, pomankanje sedežev in miz so le nekateri izmed razlogov zaradi katerih je pouk v prenatrpanih razredih neučinkovit in zaradi katerih moramo razmisliti o ohranitvi učenja na daljavo.

V primerjavi s tujimi študijami, so študentje na UL iz družin z nižjimi dohodki bili manj prizadeti zaradi pandemije koronavirus kot tudi prehoda izobraževanja iz učilnic na daljavo. Ena izmed možnih razlag je, da so razlike med dohodki v Sloveniji bistveno manjši kar potrjuje Ginijev koeficient, druga, da državne subvencije in finančne pomoči so študentom pomagale v zadosti meri, da izpadi dohodkov niso negativno vplivali na pridobivanje znanja.

Množični odprti spletni tečaji, kot je na primer Coursera, imajo že nešteto izobraževalnih programov, ki bi lahko koristili številnim študentom, UL pa ima infrastrukturno in osebje za preprečevanje goljufij s katerim se izobraževalne platforme že dolgo let borijo.

Appendix 2: Survey

Dear respondents,

Thank you for participating in my research on the impact of remote teaching on student learning and engagement at the University of Ljubljana. This research is conducted for the purpose of completing a master's thesis at the School of Economics and Business, University of Ljubljana. It is meant for students who are currently enrolled in a full-time tertiary program at the University of Ljubljana. Your data will be strictly anonymous and only be used for academic purposes. It will take you about 10 minutes to finish this questionnaire. If you have any doubt or question, feel free to contact me per e-mail: joansabbadin@gmail.com.

Q1	Which program are you currently attending at University of Ljubljana?
Q1a	Undergraduate
Q1b	Masters
Q1c	PhD

Q2	Which faculty are you enrolled in?
Q2a	Academy of Fine Arts and Design - Akademija za likovno umetnost in oblikovanje
Q2b	Academy of Music - Akademija za glasbo
Q2c	Academy of Theater, Radio, Film and Television - Akademija za gledališče, radio, film in televizijo
Q2d	Biotechnical Faculty - Biotehniška fakulteta
Q2e	Faculty of Architecture - Fakulteta za arhitekturo
Q2f	Faculty of Arts - Filozofska fakulteta
Q2g	Faculty of Chemistry and Chemical Technology - Fakulteta za kemijo in kemijsko tehnologijo
Q2h	Faculty of Civil and Geodetic Engineering - Fakulteta za gradbeništvo in geodezijo
Q2i	Faculty of Computer and Information Science - Fakulteta za računalništvo in informatiko
Q2j	Faculty of Education - Pedagoška fakulteta
Q2k	Faculty of Electrical Engineering - Fakulteta za elektrotehniko
Q2l	Faculty of Health Sciences - Zdravstvena fakulteta
Q2m	Faculty of Law - Pravna fakulteta
Q2m	Faculty of Maritime Studies and Transport - Fakulteta za pomorstvo in promet
Q2o	Faculty of Mathematics and Physics - Fakulteta za matematiko in fiziko
Q2p	Faculty of Mechanical Engineering - Fakulteta za strojništvo
Q2q	Faculty of Medicine - Medicinska fakulteta
Q2r	Faculty of Natural Sciences and Engineering - Naravoslovnotehniška fakulteta
Q2s	Faculty of Pharmacy - Fakulteta za farmacijo

Q2t	Faculty of Public Administration - Fakulteta za upravo
Q2u	Faculty of Social Sciences - Fakulteta za družbene vede
Q2v	Faculty of Social Work - Fakulteta za socialno delo
Q2w	Faculty of Sports - Fakulteta za šport
Q2x	Faculty of Theology - Teološka fakulteta
Q2y	Faculty of Veterinary - Veterinarska fakulteta
Q2z	School of Economics and Business – Ekonomska fakulteta
Q2aa	Not currently studying at the University of Ljubljana

Q3	**Are you enrolled at the University of Ljubljana as:**
Q3a	Full time Slovene student
Q3b	Erasmus student
Q3c	Full time EU student
Q3d	Full time foreign non-EU student
Q3e	Part-time student

Q4	**Please enter your nationality:**

Q5	**In the pandemic, did you experience any SOCIO-ECONOMIC ISSUES? Select all that apply and add if you had any socioeconomic issue that is not listed**
Q5a	Housing insecurity
Q5b	Food insecurity
Q5c	Unemployment of family members
Q5d	Reduction of personal incomes
Q5e	Increasing expenses
Q5f	Relatives you had to take care of
Q5g	Others:
Q5h	I did not experience any

Q6	**In the pandemic, did you experience any MENTAL HEALTH PROBLEMS? Select all that apply and add if you had any issue related to mental well-being that is not listed**
Q6a	Depression
Q6b	Anxiety
Q6c	Stress
Q6d	Sleeping disorders
Q6e	Eating disorders
Q6f	Others:
Q6g	I did not experience any

Q7	In the pandemic, did you experience any LEARNING ISSUES? Select all that apply and add if you had any learning issue that is not listed
Q7a	Time management issues
Q7b	Lack of motivation
Q7c	Lack of moral support lack of a supporting environment
Q7d	Distracting environment continuous external stimuli that make it hard to focus
Q7e	Others:
Q7f	I did not experience any

Q8	In the pandemic, did you experience any REMOTE ISSUES? Select all that apply and add if you had any other technical issue or health/well-being issue because of the excessive use of technology that is not listed
Q8a	Zoom fatigue tiredness or burnout associated with overusing virtual platforms of communication
Q8b	Eye strain eye fatigue, caused by looking at a computer screen for too long
Q8c	Connectivity issues
Q8d	Lack of computer knowledge required
Q8e	Lack of technology needed to study in remote
Q8f	Technical issues related to platforms
Q8g	Others:
Q8h	I did not experience any

Q9	Please select your level of agreement or disagreement with the following statements, where 1 means you strongly disagree with the statement and 5 that you strongly agree with it					
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Q9a	Remote learning SUITS me better than in-class learning	Q9a1	Q9a2	Q9a3	Q9a4	Q9a5
Q9b	Remote teaching negatively influenced my ENGAGEMENT during lectures	Q9b1	Q9b2	Q9b3	Q9b4	Q9b5
Q9c	Remote teaching negatively influenced my KNOWLEDGE ACQUISITION during lectures	Q9c1	Q9c2	Q9c3	Q9c4	Q9c5
Q9d	My COURSES are more suitable for in-class teaching compared to remote teaching	Q9d1	Q9d2	Q9d3	Q9d4	Q9d5
Q9e	Remote teaching is as valid as in-class teaching for TERTIARY EDUCATION	Q9e1	Q9e2	Q9e3	Q9e4	Q9e5

Q9f	I am more likely to ASK QUESTIONS during in-class lectures compared to remote lectures	Q9f1	Q9f2	Q9f3	Q9f4	Q9f5
Q9g	In a non-pandemic environment, the TRANSITION TO REMOTE would be easier	Q9g1	Q9g2	Q9g3	Q9g4	Q9g5
Q9h	My OVERALL WELL-BEING would be better in a non-pandemic environment	Q9h1	Q9h2	Q9h3	Q9h4	Q9h5

Q10	**Please select your level of agreement or disagreement with the following statements, where 1 means you strongly disagree with the statement and 5 that you strongly agree with it**					
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Q10a	Remote exams are easier to CHEAT on compared to usual in-class exams	Q10a1	Q10a2	Q10a3	Q10a4	Q10a5
Q10b	There is more CHEATING during remote exams compared to the usual in-class exams	Q10b1	Q10b2	Q10b3	Q10b4	Q10b5
Q10c	The RELATIONSHIPS with professors are better in remote compared to regular in-class	Q10c1	Q10c2	Q10c3	Q10c4	Q10c5
Q10d	Professors provide clear instructions on how the TEACHING PROCESS (lectures, assignments, etc) would be adjusted to remote learning	Q10d1	Q10d2	Q10d3	Q10d4	Q10d5
Q10e	Professors provide clear instructions on how the EXAM PROCESS will be conducted on remote	Q10e1	Q10e2	Q10e3	Q10e4	Q10e5

Q11	**Please select your level of agreement or disagreement with the following statements, where 1 means you strongly disagree with the statement and 5 that you strongly agree with it**					
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Q11a	Having a REMOTE INTERACTION (Zoom, Microsoft teams, etc) is more exhausting compared to face-to-face interactions	Q11a1	Q11a2	Q11a3	Q11a4	Q11a5
Q11b	It is very hard to create new SOCIAL TIES (new friendships and connections) with peers in remote circumstances compared to regular in-class	Q11b1	Q11b2	Q11b3	Q11b4	Q11b5

		Very disappointed	Disappointed	Neither disappointed nor satisfied	Satisfied	Very satisfied
Q11c	Since the introduction of remote learning, I have become more INDIVIDUALISTIC (learning more on your own / less group studying and helping each other than before Covid-19 and remote learning)	Q11c1	Q11c2	Q11c3	Q11c4	Q11c5
Q11d	Experiencing Covid19 has a negative impact on KNOWLEDGE ACQUISITION and EDUCATION	Q11d1	Q11d2	Q11d3	Q11d4	Q11d5

Q12	**Please select your level of satisfaction, where 1 means you very disappointed and 5 that you are very satisfied**					
		Very disappointed	Disappointed	Neither disappointed nor satisfied	Satisfied	Very satisfied
Q12a	PROFESSORS' PREPARATION for remote teaching	Q12a1	Q12a2	Q12a3	Q12a4	Q12a5
Q12b	MATERIALS UPLOADED by professors for remote teaching	Q12b1	Q12b2	Q12b3	Q12b4	Q12b5
Q12c	PROFESSORS' AVAILABILITY for questions and explanations during office hours on the remote	Q12c1	Q12c2	Q12c3	Q12c4	Q12c5
Q12d	Professor's willingness to ADAPT AND ADJUST to student needs during the pandemic	Q12d1	Q12d2	Q12d3	Q12d4	Q12d5
Q12e	QUALITY OF LECTURES during the pandemic	Q12e1	Q12e2	Q12e3	Q12e4	Q12e5

Q13	**How often do you think you have on average broken the pandemic measures imposed by the Slovene government group gathering, visits, moving between 9pm and 6am, moving to other regions without a valid reason and permission?**
Q13a	Never
Q13b	Less than once per week
Q13c	Once or twice per week
Q13d	Three or four times per week
Q13e	More than four times per week
Q13f	I don't want to respond
Q13g	I don't know

Q14	How often have you on average experienced:							
		Never	Less than once a week	Once week	Twice a week	Three times a week	Four times a week	Every day
Q14a	Voice delays and freezing screens	Q14a1	Q14a2	Q14a3	Q14a4	Q14a5	Q14a6	Q14a7
Q14b	Roommates/family members distracting (too loud)	Q14b1	Q14b2	Q14b3	Q14b4	Q14b5	Q14b6	Q14b7
Q14c	Complete inability to connect to zoom lecture	Q14c1	Q14c2	Q14c3	Q14c4	Q14c5	Q14c6	Q14c7
Q14d	Inability to upload homework and other materials	Q14d1	Q14d2	Q14d3	Q14d4	Q14d5	Q14d6	Q14d7
Q14e	Inability to actively follow the lectures	Q14e1	Q14e2	Q14e3	Q14e4	Q14e5	Q14e6	Q14e7
Q14f	Inability to turn on video or audio because of background	Q14f1	Q14f2	Q14f3	Q14f4	Q14f5	Q14f6	Q14f7

Q15	In a non-pandemic environment, which teaching method would you choose for yourself?
Q15a	In-class teaching
Q15b	Remote teaching
Q15c	Hybrid some classes online and some on remote
Q15d	Optional in-class and remote lectures, students can decide based on their schedule and preferences
Q15e	I don't have any preferences
Q15f	Others:

Q17	Were you diagnosed with Covid-19 during 2020-2021?
Q17a	Yes, I was tested positive
Q17b	No, I was not tested positive
Q17c	I was not tested but had some symptoms that might recall the Coronavirus
Q17d	I don't want to respond

Q18	**Were your family members diagnosed with Covid during 2020-2021?**
Q18a	Yes, my family member/s was/were tested positive
Q18b	No, my family members were not tested positive or had any symptoms
Q18c	No, my family members were not tested positive, but had symptoms that might recall the Coronavirus
Q18d	I don't want to respond

Q19	**What is your gender?**
Q19a	Male
Q19b	Female
Q19c	I don't want to respond

Q20	**What is your employment status?**
Q20a	I have a part-time job
Q20b	I lost my job because of the pandemic
Q20c	I am doing seasonal jobs
Q20d	I have a full-time job
Q20e	Unemployed / not working

Q21	**What is your current housing status?**
Q21a	I live in a dorm
Q21b	I live in an apartment with roommates
Q21c	I live in an apartment with flatmates no roommates
Q21d	I live on my own
Q21e	I live with my parents
Q21f	I currently live at home because of the pandemic

Q22	**Please select the statement that applies to you**
Q22a	I moved back home because the dorms have been closed
Q22b	I currently live at home to limit my expenses
Q22c	I moved back home because everything is on remote and there is no need to be in Ljubljana
Q22d	Other:

Q23	**How many people are currently living beside you in the same accommodation?**

Q24	**How many people are in your household?**

Q25	**What is your monthly net household income after tax?**
Q25a	Below 500 EUR
Q25b	501 - 850 EUR
Q25c	851 - 1300 EUR
Q25d	1301 - 1800 EUR
Q25e	1801 - 2500 EUR
Q25f	2501 - 4000 EUR
Q25g	Over 4000 EUR

Q26	**Please enter the current country of residence**

Thank you for your participation in my research!