# The Post-COVID-19 Study Experience: Modes of Study, Technology Use, and Socialisation at the University of Latvia

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## ABSTRACT

**Aim.** This study explores how the post-COVID-19 era has affected higher education at the University of Latvia, examining perceived changes in teaching and learning, the study process, and socialisation, and comparing student and teacher perspectives.

**Methods.** A quantitative online survey used a structured QuestionPro questionnaire; this paper analyses six questions on post-COVID-19 experiences in higher education. Altogether 1,053 responses were analysed (970 students; 83 teachers), using descriptive statistics and inferential tests (Mann–Whitney U) with effect sizes to assess group differences.

**Results.** The findings indicate positive changes in higher education following the pandemic, particularly greater flexibility in the study process, the provision of different modes of study, increased opportunities for online learning, and broader use of digital technologies. The post-COVID-19 period also appears to have contributed to the development of digital competence among both teachers and students, suggesting

progress in addressing the digital gap that existed before the pandemic. However, personalised and student-centred pedagogies remain only partly implemented, and some tendencies towards returning to traditional forms of higher education were identified.

**Conclusion.** COVID-19 has brought inevitable and lasting changes to higher education. While some practices appear to be reverting to pre-pandemic models, students' positive attitudes towards greater flexibility and digital opportunities may support the development of a more inclusive and sustainable higher education.

**Research restrictions.** Limitations include restricted generalisability, as the study examines a single case; broader and longitudinal follow-up research is recommended. Questions on internet accessibility were not included.

**Keywords:** post-COVID-19, higher education, students, university teachers, Latvia University

## Introduction

The COVID-19 pandemic challenged higher education (HE), university teachers, and students around the globe in 2020. Overnight, COVID-19 brought sudden changes and unexpected shifts to remote teaching and learning, putting teachers and students in an extraordinary situation. Although many researches (e.g., Adi Badiozaman et al., 2025; Bajaj et al., 2021; Baker et al., 2022; Leal Filho et al., 2023; Siow et al., 2021) have been conducted across different sectors, universities, countries, and continents involving different actors since COVID-19, there are indications that much more research is needed (Baker et al., 2022; Imran et al., 2023).

It has been noted that the impact of digitisation on sustainable development practices in HE should be studied as necessary, allowing universities to take advantage of the many opportunities provided (Leal Filho et al., 2023). Furthermore, more attention should be paid to understanding how the COVID-19 pandemic affected the sustainability of educational practices and curricula for future work practices (Alam & Asimiran, 2021; Crawford & Cifuentes-Faura, 2022). Although online technology was widely used in HE during COVID-19, it has also been questioned after COVID-19 (Alam & Asimiran, 2021; Alam, 2021). Is it a sustainable solution for HE? Is it accessible for everyone and inclusive? Should it be continued, and what is the best way to do it? As stated in research, disparities in access to and use of technology present a significant challenge in HE (Cullinan et al., 2021). Thus, the question of COVID-19's long-term effect on HE remains (Abdelkader & Barbagallo, 2022). Now that COVID-19 has peaked, it is essential to know the consequences of the pandemic in the academic field, considering whether COVID-19 resulted in the promised changes in HE and whether they will be sustainable.

Therefore, our study starts from and complements the existing literature in multiple ways. Firstly, due to the cultural context, the research tries to determine the pandemic's

implications in the post-COVID-19 era in Latvian HE, using an example of the largest University in Latvia. We will take a closer look at the digital transformation of higher education (Fűzi et al., 2022) and how it has impacted teaching and learning in higher education institutions (Baker et al., 2022) and the socialisation of students (Fűzi et al., 2022). Secondly, the research considers the perspectives (which have not been studied much so far) of students and teachers using the case of the University of Latvia (UL). Thirdly, although quite a few studies have been conducted about HE during the COVID-19 period in Latvia (e.g., Baranova et al., 2021; Daniela & Ivsiņa, 2022; Daniela & Selcuk 2022; Grinberga Zalite & Zvirbule, 2020; Kalniņa et al., 2023; Lāma & Lāma, 2020; Nīmante, 2021; Rozentāle et al., 2021; Rubene et al., 2021; Usca et al., 2023), still very little research has yet been published about Latvian HE in the post-COVID-19 period (Varpina et al., 2023). Finally, although the challenges that every university faces are different, we hope that the results will be helpful for all HE institutions in Latvia and other universities in post-Soviet European countries, as well as for any researcher studying the impact of COVID-19 on higher education. The research questions to be answered are as follows:

- RQ1: What changes have students and teachers perceived in HE (teaching and learning, e-environment, use of technologies, study modes, and design) since COVID-19?
- RQ2: What positive benefits have students and teachers perceived in the study process since COVID-19?
- RQ3: What impact does the post-COVID-19 era have on socialisation among students?
- RQ4: What differences exist between the two groups of respondents?

The remainder of the paper is structured as follows: Section 2 presents a comprehensive review of the relevant literature, focusing on the digital transformation of higher education, the emergence of new pedagogical approaches, and differences in how students and teachers perceive post-COVID-19 changes. Section 3 outlines the research methodology, including the design of the survey instrument, data collection process, and analysis methods. Section 4 presents the study's results, highlighting the perceived changes in higher education and their implications for teaching, learning, and socialisation. Section 5 critically discusses the findings concerning existing literature, offering insights into potential explanations for the observed disparities and outlining key implications for higher education institutions. Finally, Section 6 concludes the paper by summarising the main findings, discussing limitations, and suggesting directions for future research.

## Literature Research

Firstly, this section aims to discuss the changes in HE impacted by COVID-19 and the role of technologies in creating both challenges and advantages in HE. Sec-

ondly, we explore promised new pedagogical idea applicable to HE, and some potential benefits and challenges are discussed. Socialisation among students has been brought up as specific aspect. Finally, some differences perceived by students and teachers are discussed.

## Digital Transformation of HE

Previous research indicates that COVID-19 brought challenges and new advantages to HE (Kalniņa et al., 2023; Mouchantaf, 2020). From one side, the COVID-19 pandemic directly threatened the quality of HE, which was significantly affected by the digital access and technological capabilities of academic staff and students; all students and staff had to be taken into consideration to ensure inclusive and equal education (Crawford & Cifuentes-Faura, 2022; Leal Filho et al., 2023). On the other hand, COVID-19 in HE brought long-needed changes in digitalisation. In the case of Latvia, digital readiness before COVID-19 was significantly lower if compared with other European, even Baltic and Nordic countries (Grinberga Zalite & Zvirbule, 2020). Due to COVID-19, digital transformation was implemented in HE within a few weeks, affecting all actors (Fűzi et al., 2022). The pandemic reshaped the priorities of HE to achieve sustainability through digitalisation (Crawford & Cifuentes-Faura, 2022), and HE found ways to overcome the COVID-19 crisis through digital transformation technology (Leal Filho et al., 2023). Digital transformation also allowed students to be better "digitally" prepared for the workforce (Cejnar et al., 2023). There was hope that this digital transformation would continue in the post-COVID-19 era (Rubene et al., 2021). Furthermore, there was an assumption that HE would be better prepared after COVID-19 to accept and include technology as an essential component of the learning process to make face-to-face learning more flexible and engaging (Benito et al., 2021).

Technology does not inherently promote the sustainability of education. However, the experience of the pandemic prompts a reconsideration of the Technological Pedagogical Content Knowledge (TPACK) framework (Koehler, Mishra & Cain, 2013) and the Technology Acceptance Model (TAM) (Davis, 1989) from a different perspective. These theoretical concepts draw attention to the fact that the use of technology is not an end in itself. Both educators and students must make meaningful and purposeful choices regarding technological solutions, recognising that such tools do not replace but can complement the face-to-face the learning process. According to the Technology Acceptance Model (TAM), the adoption of new technologies, including digital technologies, is determined by their perceived usefulness and ease of use (Marikyan & Papagiannidis, 2024). However, in the context of our research, we want to emphasise that the experience of organising the study process during pandemics and the expansion of the use of digital technologies, to a large extent, forcibly, requires attention to the responsible use of technology by everyone involved in the study process.

## Promised New Pedagogies in Post COVID-19 Era

An extraordinary situation that emerged in HE during the pandemic also promised new pedagogies where teaching is more student-centred, personalised, culturally responsive, and inclusive and provides a more diverse environment for learning (Baker et al., 2022). Assumptions about entering the "new normal" where online teaching and remote learning were combined with in-person studies would stay in HE forever were put forward. Before COVID-19, it seems that students did not have much experience with online learning and working from home (Yan et al., 2022). Although the transition to the remote learning process was generally a challenge for the students, many seemed to appreciate it as a positive opportunity (Kalniņa et al., 2023). In research in the Netherlands, students evaluated the virtual learning experience as positive, and most wanted to continue such virtual lessons even after COVID-19 restrictions were removed (Suleri, 2020). Despite the questions about the effectiveness of online delivery (Alam & Asimiran, 2021), there was a hope that online teaching and learning would not be just a short-term solution but a viable way to provide qualitative HE in the long term (Baranova et al., 2021). The shift to so-called emergency remote teaching during COVID-19 showed that both teachers and students could adapt to new ways of teaching and learning (Baker et al., 2022), and it promoted a general sense of flexibility in HE (Jafari, 2023; Fűzi et al., 2022).

First, this flexibility involved moving into asynchronous modes of pre-recorded lectures, flexible schedules, different paces and engagement with course materials, and hybrid/dual modes (online and in-person delivery of lectures and seminars) (Baker et al., 2022; Siow et al., 2021), simulations, virtual reality, and augmented reality (Chans et al., 2023). This helped students save time and money and provided greater comfort (Kalniņa et al., 2023; Yan et al.,2022). Secondly, assessment and assessment policies were modified to take barriers affecting students' learning during COVID-19 into account (Baker et al., 2022; Siow et al., 2021). Thirdly, different engaging activities were provided due to the difficulties of students keeping attention (Kalniņa et al., 2023), like "gamification" (Ofosu-Ampong, 2020), visualisation (Passantino, 2021) or real-time polling and multiple-choice quizzes during classes (Yan et al., 2022), such as those provided by Mentimeter and Kahoot (Siow et al., 2021). Fourthly, students and teachers were supported psychologically and in the study process by providing teachers with support and resources, helping to raise the competence of educators in online teaching (Siow et al., 2021), and students with additional materials online (Kalniņa et al., 2023). Due to social distancing and other restrictions during COVID-19, support for students' well-being was provided by creating a sense of belonging (Baker et al., 2022) and providing physical and mental wellness services (Siow et al., 2021). Student mental health issues were also addressed by different support units and fee reductions at universities (Nīmante, 2021). During the pandemic, the lack of real-life socialisation opportunities was made up for by trying to form virtual communities

during online lectures and seminars. However, these could not fully replace real in-person socialisation. Therefore, the issue of quality student socialisation in HE remained a question – would it be the same, would it come back as normal, or would it be even better? Simone Eringfeld (2021) explained that students' fears about the post-COVID-19 period were about the "embodied and communal experience" being lost. At the same time, moving to an online university was considered a "dystopian outcome" of the pandemic (Eringfeld, 2021).

## Perceptual Differences between Teachers and Students

Although many benefits from online teaching and learning have been recognised, such as improving digital competence, not all students were happy with such a way of learning (Yan et al., 2022), and not all teachers intended to continue teaching online after returning to in-person teaching (Bajaj et al., 2021). Interestingly, some gender differences were indicated: male teachers were more inclined to continue with online teaching than female teachers (Bajaj et al., 2021).

Three forms of study organisation can be distinguished in higher education after COVID-19: fully remote, hybrid (where face-to-face studies were combined with remote studies within epidemiologically safe limits), and a return to the status quo ante. Abdullatif AlMunifi and Mohammed S. Alfawzan (2023) identified that hybrid learning has significant support among students but only partial support from academic staff. Both students and teachers have expressed their disapproval returning to the old routine, i.e. only face-to-face learning, and a transition to a completely remote form of learning (Selvaraj et al., 2021).

# Methodology

## Instrument

This research adopted an online survey using a quantitative method of data collection. Based on the literature review, the research team developed a structured QuestionPro questionnaire with 37 questions that were then shared with lecturers and students from UL. The questionnaire consisted of four sections. The first demographic section was composed of 10 questions (gender, age, study level, and position at the university). Section two consisted of 15 questions related to the use of artificial intelligence in HE, section three included questions about the self-directed learning experience in HE, and section four included questions related to students' HE experience in the post-COVID-19 era. This paper analyses only part of the questionnaire related to the research questions and considers the six questions on students'

post-COVID-19 experiences in HE. Some questions required respondents to answer using a 4-point Likert scale or were simple *yes/no* questions; others were open-ended.

The study's main variables were categorised into independent and dependent variables. The independent variables included the respondent type, a categorical variable indicating whether the respondent was a student or a teacher. Additionally, various demographic factors were examined, such as age, gender, and, for students, study level, field of study, type of program, mode of study, and employment status. For teachers, the demographic factors included academic roles and related responsibilities.

The dependent variables comprised several key aspects of the post-pandemic study process. Perceptions of pedagogical changes were measured through responses to questions about changes in teaching styles, such as the use of traditional lectures, flipped classrooms, and cooperative learning approaches. Digital competence refers to self-reported improvements using digital tools for study and instruction. The e-study environment was assessed based on participants' evaluations of the accessibility and structure of online learning resources. Socialisation captured respondents' self-reported levels of student interaction, comparing their experiences before and after the COVID-19 pandemic. Additionally, the study examined the perceived benefits of post-pandemic educational changes, including improved flexibility, financial savings, enhanced self-directed learning skills, and the ability to balance studies with work better. The relationship between these variables was analysed to understand how demographic factors and respondent types influenced perceptions of pedagogical changes, digital competence, and socialisation in the post-pandemic era.

The original questionnaire was constructed by researchers based on the theoretical review and then reviewed by three field experts from UL to ensure content reliability. Based on their recommendations, slight modifications (for the clarity of language) were made. Next, three students and two university teachers were asked to fill in the questionnaire and comment on the use of the instrument. Based on their feedback, further modifications were made to ensure that questions were appropriate for collecting valid and reliable data.

## Data Collection and Analysis

The questionnaire was available on QuestionPro from April 5 to May 15, 2024. Information about the opportunity to participate in the survey was sent to UL students and teachers via e-mail by the UL Academic Department, and responses were obtained from 1,053 participants (970 students and 83 teachers). The study followed UL's research ethics recommendations, and respondents were guaranteed complete anonymity. Participation in the survey was voluntary and anonymous. A convenience sampling method was employed to select respondents based on their availability and willingness to participate.

When the data were analysed, *Rather agree* and *Fully agree* responses were combined as positive answers. In the analysis of each question, it was considered that some respondents (students) did not answer questions or did not have an opinion about changes because they were not studying at the time of COVID-19, so comparisons could not be made, and those answers were filtered out. Internal consistency was assessed using Cronbach's alpha ($\alpha = 0.971$). An alpha value of 0.7 is conventionally used as a reliability threshold (Taber, 2018). The reliability of all measurements in the survey was $\alpha$=.971, indicating excellent reliability of the instrument.

Descriptive and inferential statistical methods were used to analyse the data. Descriptive statistics (frequencies, mean ranks) provided an overview of respondents' characteristics and general perceptions. Inferential statistics, including the Mann–Whitney U test, were conducted to identify significant differences between groups. In addition to the Mann–Whitney U test we report medians and standard deviations for both groups, the exact p-value, and the rank-biserial correlation r as an effect-size measure. The rank-biserial coefficient is interpreted according to common conventions ($|r| < 0.10$ = negligible; $< 0.30$ = small; $< 0.50$ = medium; $\geq 0.50$ = large). Group distributions are visualised using boxplots. Significant variables were analysed to understand relationships between demographic factors, digital competence, and socialisation patterns.

## Characterisation of Sample

Initially, we asked all UL students and teachers to complete the questionnaire. In the current academic year, there were 15,250 students and 1,369 faculty members at UL. 1,374 respondents completed the survey: 1,273 students (8.3% of all UL students) and 101 teachers (7.38% of all officially elected UL teachers).

For the current study, we separated the respondents who answered questions about post-COVID-19 situations from the pool, resulting in a total of 1,053 respondents: 970 students and 83 university teachers. The age of respondents ranged from 18 to 79, and 861 (82%) were women (women make up 72% of all those studying at UL). The respondents represent all fields of study at UL, but more than half were from the field of social sciences (55% students and 41% teachers).

Regarding the student respondents, 66% are full-time students, while 34% are part-time students. 60% are studying in academic programmes, and 40% are enrolled in professional programmes. 18% of all students are studying in college-level programmes, 62% in bachelor-level programmes, 15% in Master's-level programmes, 4% in doctoral-level programmes, and 1% in residential (medical education) programmes. Additionally, most students work – 50% work full-time, 24% work part-time, and 26% are unemployed. Regarding the teachers, 36% work in academic programmes, 8% in professional programmes, and 56% in both types.

# Results

## Perceived Changes in HE by Teachers and Students

To address RQ1, four key themes were examined: changes in classroom formats, the e-study environment, online and in-person learning opportunities, and the use of technology). The following four questions were analysed: How have classes changed since COVID-19? How has the e-study environment in courses changed since COVID-19? How have the opportunities to study in person and online changed since COVID-19? How has the use of technology in the study process changed since COVID-19?

### *Classroom Formats*

Respondents were asked to evaluate six statements when answering the question "How have classes changed since COVID-19?" As shown in Appendix Figure 1, both students and teachers agree that changes have been made since COVID-19. They also reported increased use of blended learning, which includes face-to-face learning, e-learning, and a combination of both, as well as additional technology usage in classes.

Although both groups agreed that so-called traditional lectures are implemented less in practice, 55% of respondents noted that traditional face-to-face lectures still dominate despite the growth in flipped classrooms and cooperative learning. Students were more positive about flipped-classroom implementations than teachers (Mdn_students = 2.0, SD = 0.87, n = 837; Mdn_teachers = 2.0, SD = 0.82, n = 83; mean rank_students = 453.5, mean rank_teachers = 531.3; Mann–Whitney U = 28,863.0, p = .006, rank-biserial r = .17, small effect). Even fewer students and teachers agreed that teachers personalise the study process, i.e., enable students to study according to their needs, for example, at their own pace, using technology. The disparity suggests that teachers may face more challenges adapting to student-centred approaches.

Answering RQ4, we found statistically significant differences in how students and teachers perceive the implementation of flipped classroom learning and different forms of cooperative learning since COVID-19. For instance, students noticed much more changes in the study process than teachers, teachers are more critical. However, the effect size (r=.078) is very small.

### *E-Study Environment*

As shown in Appendix Figure 2, both groups observed improvements in the availability and structure of online learning materials. More than 70% of respondents agreed that more useful course materials and additional materials are available. However, less than half of respondents agreed that videos and self-assessment tools are more available since COVID-19. Given that these tools are essential in the context of self-directed learning, the producing and self-assessment tests could be a challenge for teachers in the following years, requiring institutional support.

### *Study Modes and Flexibility*

More than half of students and teachers agree that teachers have become more flexible and are more ready to adapt to students' needs and requests' by offering remote learning. As shown in Appendix Figure 3, both students and teachers acknowledged increased flexibility in study options (e.g., hybrid and remote formats). However, more than 60% believed that nothing has changed, and the institution is reverting to pre-pandemic norms, prioritising face-to-face instruction over hybrid models.

Nevertheless, more than half of students and teachers agree that courses are taught partly face-to-face and partly online. Answering RQ4 statistically significant differences between teachers and students were found in their responses to the question related to teaching in the hybrid format, where face-to-face and remote students are given equal opportunities to engage and learn. However, the effect size is very small (p=.014, r=.085). The same applies to their responses to the question about the difficulties caused by classes being scheduled in person and online on the same day. Students are more positive about such experiences than teachers are (p=.014, r=.085).

Technology use. While over 50% of respondents acknowledged increased use of digital tools for collaboration (e.g., group work and discussions), more technology is used in everyday lessons (admitted by 50.7 % students), 40% reported that the extent of technology integration has plateaued. As shown in Appendix Figure 4, technology based learning methods are used much less.

Both groups indicated similar hesitation toward more advanced technology-based tools such as virtual simulations (Mdn_students = 3.0, SD = 0.97, n = 730; Mdn_teachers = 3.0, SD = 0.77, n = 79; mean rank_students = 402.2, mean rank_teachers = 430.8; Mann–Whitney U = 26,797.0, p = .281, rank-biserial r = .07, negligible effect).

## Positive Benefits in the Study Process Since COVID-19 Perceived by Students and Teachers

To answer RQ2, the respondents had to evaluate 19 statements. Both students and teachers equally agree that more online opportunities have been provided to UL students during the study process since COVID-19 (Appendix Figure 5). Both teachers and students agree that technologies are more accepted as an opportunity to learn.

Answering RQ4, a significant difference was found in several statements between the answers of students and teachers.

### *Digital Competence Development*

For instance, although teachers agree they have improved their digital competence, students are even more positive. 84% of students and 87% of teachers agreed that their digital skills have improved since the pandemic. Students and teachers have similar views

on the increase in students' digital competence, but interestingly, they have statistically significantly different (p=.002) opinions on the increase in teachers' digital literacy. Teachers are more sceptical (76.6% agreed that teachers' digital competence has increased) than students (87.1% gave a positive answer). However, the effect size of these differences is small (r=.013). This could suggest that while both groups benefited from digital transformation, students appear more optimistic about teachers' progress in adopting digital tools and methods. One possible explanation is that students observe the results of teachers' digital engagement during lectures and learning activities. In contrast, teachers may be more self-critical of their digital competence, particularly if they feel unprepared or under-resourced for advanced digital teaching practices. The findings point to the need for continued professional development for teachers to build their knowledge body, awareness, and confidence and ensure that digital tools are integrated effectively and purposefully into their teaching.

### *Flexibility and Convenience*

More than 85% of students reported that the hybrid study mode allowed them to better balance their studies with work while teachers were less enthusiastic (only 70% agreed that the hybrid format supports students). The difference was statistically significant with a medium effect: Mdn_students = 2.0, SD = 0.84, n = 695; Mdn_teachers = 2.0, SD = 0.73, n = 77; mean rank_students = 372.1, mean rank_teachers = 516.5; Mann–Whitney U = 16,748.0, $p < .001$, rank-biserial r = .37 (medium effect).

### *Financial Benefits*

80% of students indicated financial savings due to reduced commuting and on-campus expenses. Teachers did not perceive this benefit as strongly, which may relate to their limited understanding of students' needs and daily challenges.

### *Development of Skills*

The same applies to other statements — students are more positive about the statement that studying since COVID-19 has improved their awareness of the necessity of digital skills in their study process, made them more independent, improved their self-directed study skills, obtained self-assessment skills, and earned them higher grades. Students perceive that these changes make studying much more enjoyable. While differences between students' and teachers' answers were significant, they had small effect sizes.

### *Support for Students and Teachers*

The results also show that the support that emerged during COVID-19 continues for students but not for teachers – more than half of the students noticed the continua-

tion of such support. It would also be useful to regularly assess the digital competence of teaching staff and offer targeted resources to promote confidence and effective use of digital tools. Such peer support would help strengthen teachers readiness to embrace innovation in their studies and alleviate the pressures created by the rapid shift to digital teaching during the pandemic.

## Impact on Socialisation Among Students in the Post-COVID-19 Era

Most respondents from both groups perceive that students are socialising less since COVID-19. However, there were significant differences between students' and teachers' answers (see Appendix Figure 6). Students are more positive than teachers: 15% of students perceive much more actively than before COVID-19, and less than half think that their socialisation has decreased. At the same time, 64% of teachers believe that students socialise less than before COVID-19, and only 6% think they socialise much more.

Although both groups most often chose the middle category ("the same as before COVID-19"), the median response of teachers was lower (Mdn = 1 — "we socialise less") than that of students (Mdn = 2 — "the same as before"). The shift in central tendency was confirmed by the Mann–Whitney U test: $U = 23{,}995.5$, $p = .002$, with a rank-biserial effect size $r = .20$ (small but observable). Descriptive statistics: students $n = 779$, Mdn = 2.0, IQR 1–2, $SD = 0.72$; teachers $n = 77$, Mdn = 1.0, IQR 1–2, $SD = 0.62$. As shown in Appendix Figure 6, the central 50% of teachers' answers lies closer to "less socialisation", whereas students' responses are centred on "the same as before", indicating that teachers perceive the impact of COVID-19 on student socialisation more negatively than students themselves do.

Overall, students are more positive about social interaction and believe that socialisation is the same or more active. The contrasting perceptions suggest that teachers may be comparing the current environment to pre-pandemic in-person norms, while students may be adapting to the "new normal" of hybrid interaction. The findings suggest that face-to-face socialisation remains important for fostering a sense of belonging despite virtual communities and online collaboration tools. This highlights a need for HE institutions to create more opportunities for in-person interaction while maintaining the flexibility of hybrid models. Targeted social engagement initiatives could help address lingering concerns about isolation and support holistic student well-being.

# Discussion

The COVID-19 global pandemic challenged HE worldwide and inevitably had consequences on the academic field. In this study, we explored the changes perceived by university teachers and students using the case study of UL. We can generally agree with previous studies that COVID-19 transformed HE and hope it will never

be the same again (Arday 2022; Baker et al., 2022). At the same time, in the case of UL, there are signs of returning to the "old normal", thus posing new challenges to the sustainable development of HE.

In this research, we noticed some transformations in HE perceived by both teachers and students. For instance, both teachers and students are positive about using blended learning. Such flexible delivery modes (Baker et al., 2022; Siow et al., 2021) have been adopted during COVID-19 and will be continued in the future. The results are in line with other research findings (Guppy et al., 2022; Probst & Zizka, 2024). As concluded, blended learning mode is a crucial factor for promoting better learning outcomes in HEIs post-Covid-19, as it combines the advantages of both traditional and online modes (Imran et al., 2023). More than half of the respondents in our research agree that since COVID-19, technologies have been used well to promote cooperation and communication during classes by organising group or pair work. Both students and teachers equally agree that more online opportunities are provided to students, and technologies are more accepted as an opportunity to learn during the study process. The results align with other research (Guppy et al., 2022). Thus, COVID-19 helped to accept the digital mode of curriculum delivery and promote digital transformation in HE (Purnomo et al., 2024, Probst & Zizka, 2024). Although a significant difference was found between students' and teachers' answers about improving teachers' digital competence (students were more positive), most students and teachers agree that teachers' and students' digital competence have improved. Those results align with previous results in Latvia (Daniela & Selcuk, 2022) and internationally (Leal Filho et al., 2024). The same applies to the statement that students are more aware of the necessity of digital skills in their study process. The results confirm that good progress has been made in overcoming the digital gap that existed before COVID-19, that the rapid digitalisation processes taking place in HE during COVID-19 affected all actors (Fűzi et al., 2022), and that digital transformation is continuing in the post-COVID-19 era.

It also seems that the COVID-19 era helped to improve the UL e-study (e-platform) environment; both students and teachers agree that many more teaching materials are available in the e-courses now and that the e-courses have become more structured. At the same time, there is still a need to improve the e-environment in e-courses to provide a more student-centred approach. This may be done by modifying and improving assessment strategies (Baker et al., 2022; Siow et al., 2021), offering self-assessment instruments to students, and finding opportunities to watch lecture video recordings or specially prepared educational videos on the topics discussed.

Nevertheless, it seems that despite the hopes and predictions (Baker et al., 2022), the pedagogies used at UL have not changed so fast. Undoubtedly, the new pedagogies towards more technology-enhanced learning in higher education were promoted during COVID-19, and they are in line with other countries' experiences (Zaimakis & Papadaki, 2022). However, in our research, only a small number of students and teachers agreed that teachers personalise the study process, i.e., enable students to study according to their

own needs or at their own pace, using technology. There is a need for future research to understand could it be related to the aspects of students' insufficient self-directed learning skills (Daniela & Ivsiņa, 2022) or university teachers' tendency to use more traditional ways of teaching. However, students were more positive than teachers in how they perceived the implementation of new pedagogies, such as flipped classroom learning and implementing different forms of cooperative learning after COVID-19. Although some changes in the methods used were noticed, we cannot agree that there have been significant pedagogical transformations (Pandya et al., 2022). We know that the COVID-19 pandemic provided an opportunity for higher education teachers to reflect on and rethink their teaching practices. As a result, many teachers have sought to integrate their newly acquired experiences into their post-pandemic teaching. At the same time, it is important to remember that the goal is effective learning. This raises the question: by doing things differently, can we achieve better results (Guppy et al., 2022)?

Students were also more positive about the statements that studying after COVID-19 helps them better combine studies with work, that there are financial benefits, and that they can be more independent, have improved self-directed study skills, have obtained self-assessment skills, and get higher grades. Students also perceive that studying is now more enjoyable. Thus, our results confirm previous research results, according to which students highly appreciate remote and combined learning opportunities. It brings many positives, including less time spent travelling, improved finances, better combining work and studies, enhanced opportunities to design learning experiences to suit their students' needs (Baker et al., 2022; Guppy et al., 2022; Kalniņa et al., 2023; Yan et al., 2022).

Our results show that both students and teachers have noticed changes in the possibilities of teaching face-to-face and remotely. However, over 60% believe that UL has essentially returned to the status quo ante. One should not interpret it as a deterioration since the chosen methods and forms of learning has to be evaluated in the context of the effective teaching and results achieved by students. However, it shows that most teachers prefer face-to-face lectures, which reflects previous research (Bajaj et al., 2021). Even though the laws of Latvia determine the proportion of how many HE classes can take place remotely and how many face-to-face after COVID-19 (Latvijas Republikas Ministru kabinets, 2022). It would be valuable to organise more hybrid courses to encourage the participation of students who have fallen ill or have a hard time combining their work and studies, as well as to prevent the loss competence acquired during the period of remote learning. Teachers made significant adjustments to adapt during the shift to digitally supported remote delivery during COVID-19 (Thomas et al., 2023); the use of technologies broke the ice, and there was decreased resistance in HE to digitalisation (Fűzi et al., 2022). Although it was hoped that hybrid/blended learning would be a part of sustainable HE after COVID-19 (Guppy et al., 2022), the results of the current study show that it is not easy to provide blended learning after assessing learning needs as everyday organisational factors often take precedence. However, the case may differ in countries with a different socio-economic situation from Latvia and with a sufficient provision of human resources.

Regarding the question about students' levels of socialisation in the pre- and post-COVID-19 times, most teachers and students perceived that students now socialise less. It probably comes from social isolation experienced by the academic community and students' higher stress during COVID-19 (Nīmante, 2021; Varpina et al., 2023) and digitising communication that continues even after COVID-19. However, students and teachers perceive the situation significantly differently. Students are more positive about socialisation returning to normal or even believe that there is more socialisation than before. Thus, we can assume that students have adjusted faster and much better to the new digitising communication. Researchers need to conduct further research to determine whether the social isolation induced by COVID-19 led to such results or digitalisation (Fűzi et al., 2022), or other factors.

Finally, we found some significant differences with small effect sizes between the two groups of respondents. In most cases, teachers are less optimistic. One can interpret it at least in two ways. Firstly, it could relate to the well-being issues of UL teachers during the COVID-19. What we know from previous research is that online learning during the pandemic affected both students' and teachers' well-being (Al-Sabbah et al., 2021). Research in the UK reported higher stress and anxiety among university staff compared with the national average during COVID-19 (Dougall et al., 2021). Even after COVID-19, research from around the globe (Rahman et al., 2024) continues to show that university employees have experienced high stress levels. As concluded by Brendan T. O'Connell (2022), academic performance is judged by research outcomes. However, at the same time, during the COVID-19 era, there was a high demand for university teachers to develop extra high-level, qualitative online teaching materials for students, which created extra tension. Secondly, university teachers may still lack the necessary knowledge and technological awareness, which can affect their well-being and use of technology (Alsheikh et al., 2024). Many university teachers were unprepared for online teaching when the COVID-19 outbreak occurred, and they faced numerous challenges. Therefore, to reduce stress and bridge knowledge gaps, more targeted support for university teachers should be provided during crises (Gutman et al., 2024) and even after. At the same time, taking account that effect sizes between two groups were small there we have further analyse the context.

## Implications and Limitations

We argue that returning to the status quo ante will not contribute to sustainable development because the skills acquired during COVID-19 would not be maintained or applied in the future. Although providing students with sustainability skills with the support of technology is a challenge, it is also an opportunity for HE institutions. The pandemic has presented also a unique opportunity to transform HE. An institutional decision is required to make the changes permanent (Greere & Crozier, 2024).

This decision should be further reflected in the plans, visions, and regulatory documents developed by individual faculties and HE as an institution to maintain the progress achieved (Hill & Smith, 2023). HE institutions should make more explicit the vision and realistic goals to integrate sustainable development into the institution's mission (Leal Filho et al., 2023). There should also be developed some policy framework that can manage higher education during an emergency (Alam & Parvin, 2021).

From our research, we can say that the support that emerged during COVID-19 continues afterwards for students but not for teachers. This raises many questions, as inclusivity and the well-being of all stakeholders are vital to ensure the sustainable development of HE. At the same time, we hope students' positive perceptions about changes brought about by digital transformation in UL will help the institution carry on the transformation of HE that started during the pandemic. There are some important implications and recommendations for teachers and institution from our research – for promoting self-directed and more personalised learning, there is an obvious need to improve the e-environment by providing more videos and developing more self-assessment tools for students. We should integrate the new, more personalised, student-cantered, and inclusive pedagogies into practice. As stated by research, there is still a gap in the literature regarding the contribution of digital transformation to sustainability in HE (Trevisan et al., 2024). Much more is needed than just using the online instructional mode, as it does not have a noticeable effect on students' acquired knowledge and skills (Rataj & Berezovska, 2024). There is a need to use technologies in a mature and purposeful way and promote other transformations in HE. It should not be assumed that technology-enhanced learning automatically makes education sustainable, even though theories and policy documents sometimes encourage this uncritical acceptance as an axiom. However, this must always be empirically tested to understand how those involved perceive it and how responsible their attitudes toward teaching and learning are (Daniela et al., 2018).

Several limitations to this study should be noted. The findings are not intended to generalise post-pandemic learning in Latvia's higher education (HE), as we explore only one case: the University of Latvia (UL). Nevertheless, these results provide a starting point for more extensive studies; we emphasise the need for future research that includes other universities in the study and much deeper studies to find more about the context of the real world. Additionally, we suggest conducting a longitudinal study to track the long-term impact of the pandemic on HE. Another limitation is our decision not to include questions regarding internet accessibility, as we know that internet access is very high in Latvia (92.9%) (Kemp, 2024).

## Conclusions

This paper aimed to investigate the changes COVID-19 brought to one HE institution in Latvia, emphasising digitalisation, changes in pedagogies and socialisation.

To conclude, COVID-19 has affected and will continue to affect the future of UL. We will probably not fully return to a pre-COVID-19 situation. However, there is some temptation to return to the old normal. Our research results show that the more extensive use of digitalisation during COVID-19 has brought greater flexibility to the study process. Teachers are more ready to adapt to students' requests, provide different delivery modes during the study process, ensure more online study opportunities, and use more technologies. Since COVID-19, teachers in UL have used different forms of study organisation: fully remote, hybrid, and fully face-to-face. Furthermore, the university's e-study environment (e-platform) has been greatly improved. Although there was a hope that COVID-19 would bring rapid changes to HE pedagogies to become more student-centred, inclusive, culturally diverse and personalised, our research shows there is still a long way to go in this regard, despite some initial progress. The main benefit of COVID-19 is that students and teachers have higher digital competence in the study process.

Regarding students' socialisation, students seem to socialise less than before. However, there are some significant differences in how students and teachers responded to this question (students were more positive). In fact, students were much more positive about many aspects analysed in the current research, and significant differences were indicated between the two groups of respondents regarding many questions.

In conclusion, this paper highlights some positive aspects of the digital transformation COVID-19 brought to HE. We hope that digital transformation in future will also bring solid pedagogical transformation, which should go hand in hand with technological transformation and HE transformation.

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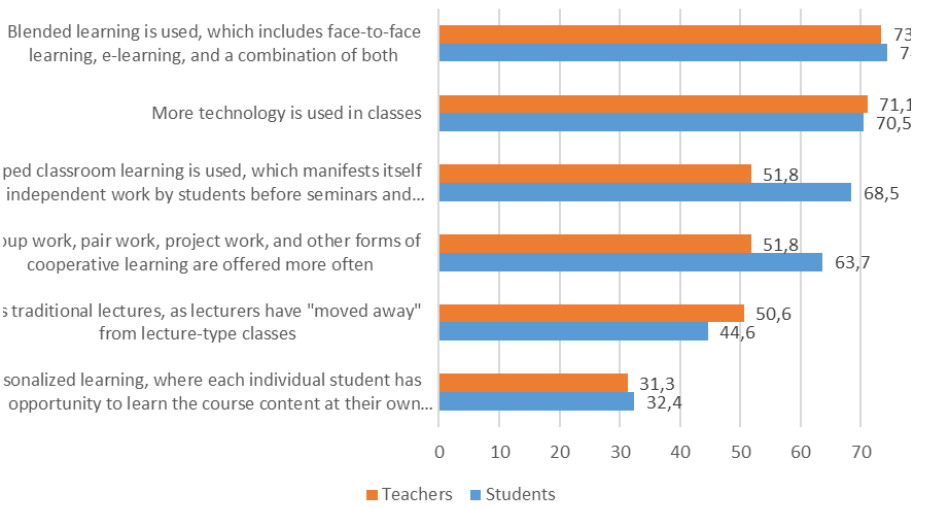
# Appendix

**Figure 1**

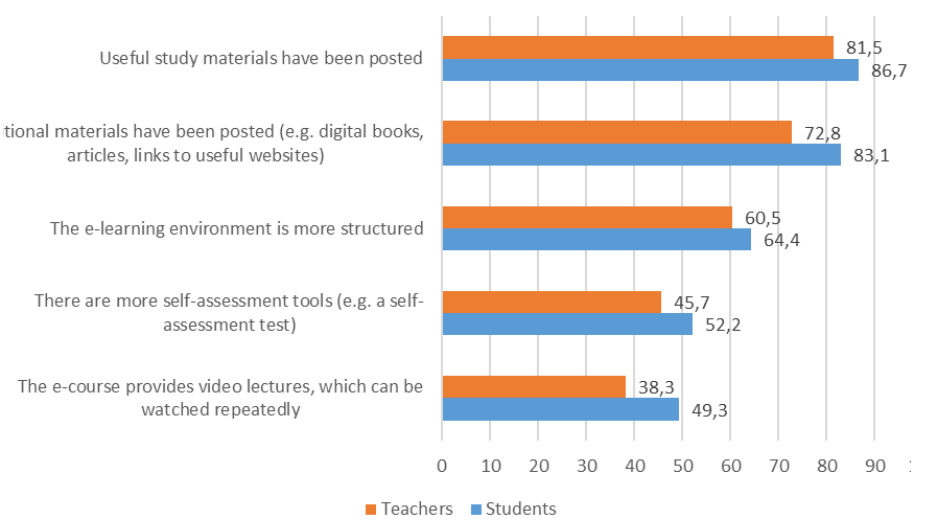
*Changes in Lessons Since COVID-19 (% of Positive Respondents)*




*Source.* Own research.

**Figure 2**

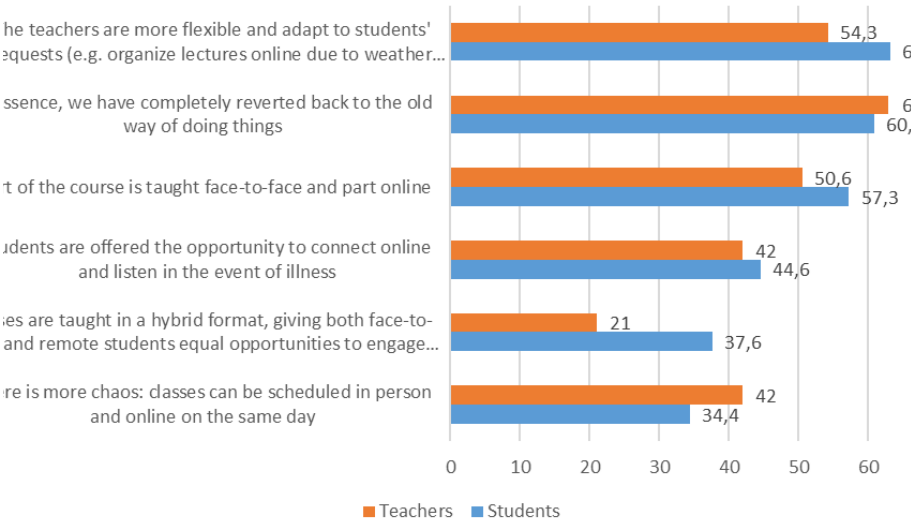
*Changes in the e-learning environment since COVID-19 (% of positive respondents*




*)Source.* Own research.

**Figure 3**

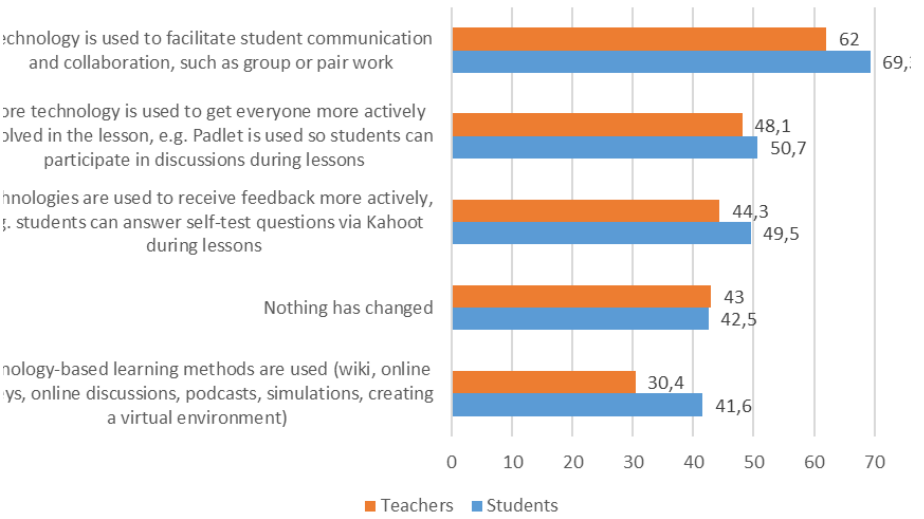
*Changes in the opportunities to study in person and online since COVID-19 (% of positive respondents)*




*Source.* Own research.

**Figure 4**

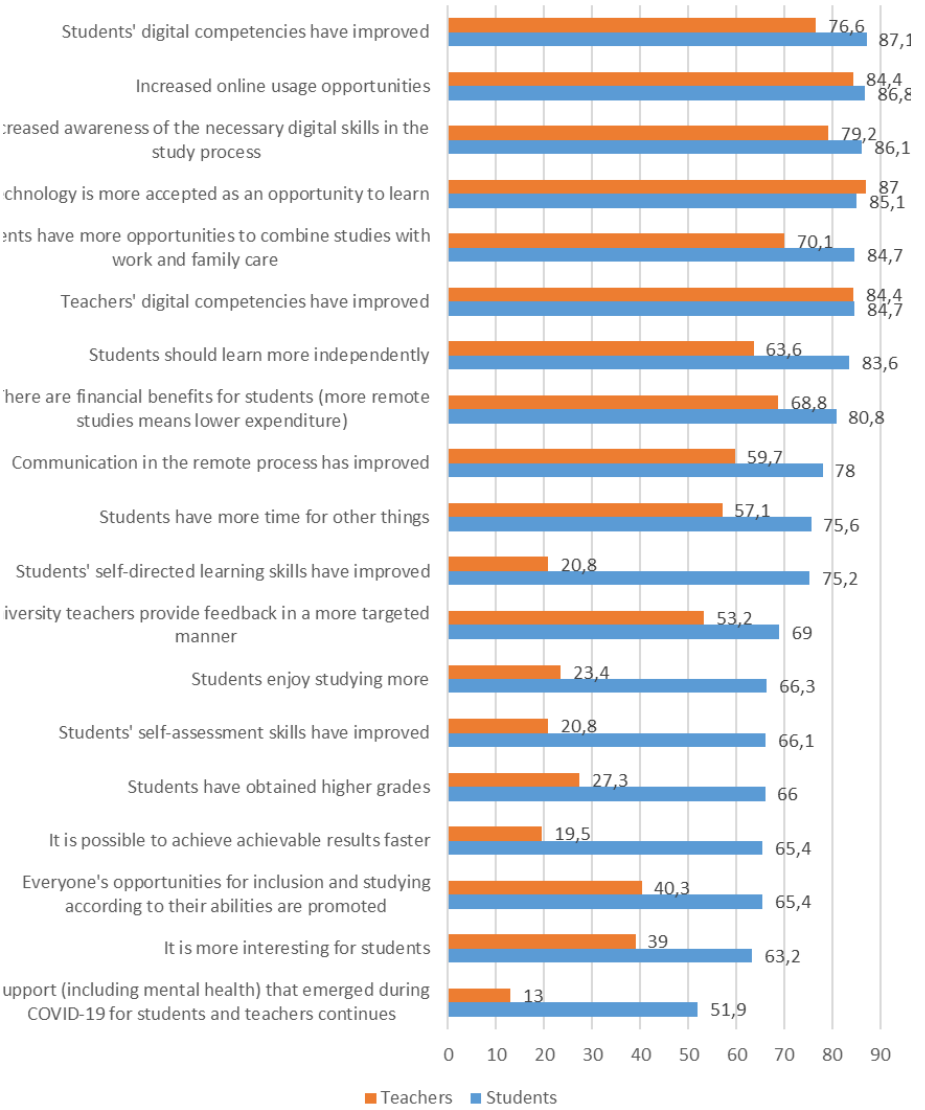
*Changes in the use of technology in the study process since COVID-19 (% of positive respondents)*




*Source.* Own research.

**Figure 5**

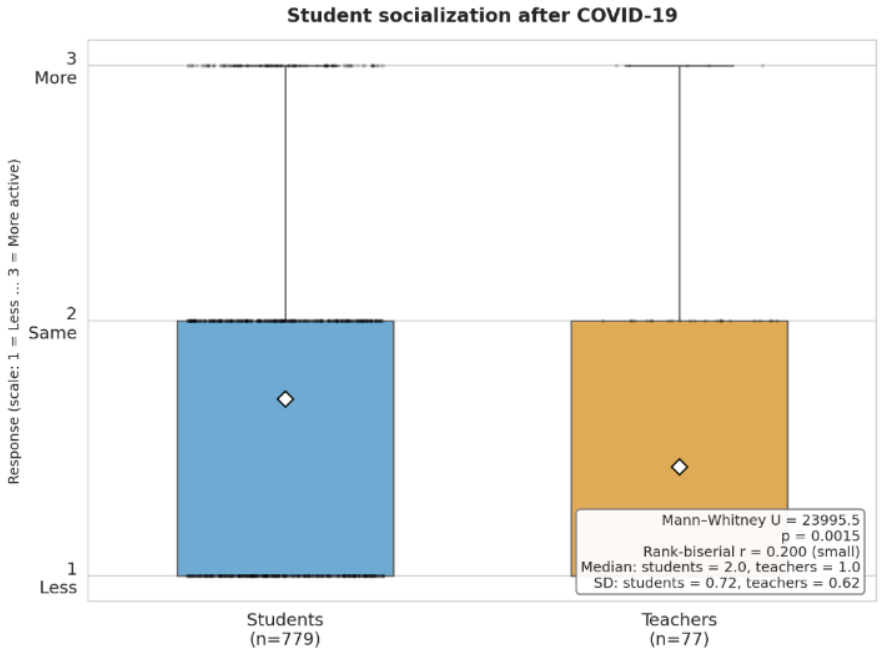
*Benefits of the Changes in the Study Process that Occurred During COVID-19 (% of Positive Respondents)*




*Source.* Own research.

**Figure 6**

*Distribution of Perceived Socialisation Level After COVID-19 Among Students and Teachers*




*Source.* Own research.