Back to campus after the Covid-19 pandemic: A qualitative study from the students perspective

Rolando Gonzalez[1], Kjetil Raaen[1], and Hanne Sørum[1]

School of Economy, Innovation, and Technology
Kristiania University College
Oslo, Norway

Abstract. In this paper, we investigate the reopening of society after the Covid-19 pandemic looking especially for long-lasting effects of the lockdowns on teaching in higher education. We conducted a survey among Bachelor's students within the field of Information Technology (IT). This paper presents the results of thematic analysis on the qualitative data of this survey. The importance of student activity and interaction within social constructivism is used as a foundation for our analysis and discussion of the post-pandemic situation. We found that students have come to expect both streaming and recording of lectures for flexibility and usefulness as learning resources. On the other hand, students are very clear that they learn better during physical lectures and that digital teaching is seen as inferior in many ways. It seems that going forward, as lecturers, we should find ways of combining online and traditional teaching.

Keywords: Higher education · Qualitative data · Post Covid-19 · Social Constructivism · Hybrid Education · Universal Design of Education

1 Introduction

We have left behind the Covid-19 pandemic that led to sudden lockdowns of society around the world, and now we should look ahead and move on. However, we start with a short recap. In April 2020, higher education in Norway had to switch from physical to digital teaching from one day to the next. The same thing happened in the whole world at about the same time. For students, the next two years or so were spent with a high degree of digital teaching, before the society opened up again. During the lockdowns, students had to study from home and were not allowed to meet fellow students and lecturers. All interaction and communication was made digital.

The authors have gained a lot of new experience after returning to location-based teaching. One of the authors experienced how the pandemic changed views: *About five years ago there was a blizzard and chaos in traffic. One of the authors had to use a tractor to clear snow and then drive a car through the snow to catch a much delayed train to get to the lecture. The lecturer announced that he would be late and arrived in the lecture room two hours later. Then a new challenge*

arose: Almost no students came to the lecture due to weather conditions. A few years later and just after the reopening after the pandemic, there was another blizzard, a lot of snow and chaos everywhere. Then, the lecturer did not even consider struggling through the chaos and probably not making it in time. This time, as a matter of course, the lecturer moved the lecture to Zoom. In no time, this was arranged. To the delight of both students and the lecturer! This example is probably not unique and testifies to how, after the pandemic, we all make use of technological opportunities to a much greater extent, also in higher education. Five years ago, this was *not* an option we considered, although technology *was* available.

The present study is exploratory in nature and we focus on the reopening of society without restrictions after Covid-19. We investigate the students' view of the situation after the pandemic. Drawing on the students' experiences, we aim to contribute to a deeper understanding of their learning process within higher education. We draw on qualitative data collected through an online survey questionnaire among bachelor's degree students in Information Technology (IT) in Norway. Data were collected in late 2022 and early 2023. The survey consisted of questions with fixed responses intended for quantitative analysis, in addition to open-ended questions that allowed free text responses for qualitative analysis. This paper reports on a qualitative analysis of free-text responses, as part of a larger study. Thus, it is distinct in terms of research purpose, theoretical grounding, data presented, data analysis and discussion. Due to space constraints and a different group of authors, the results of the quantitative work are presented in a separate paper.

2 Background

2.1 Pedagogical background

This paper uses social constructivism to frame the discussion of our findings. A core idea in constructivism is that the student is not an empty vessel into which the teacher simply can pour knowledge. A student is rather a human making sense of their world and constructing their own knowledge, where new knowledge is incorporated in light of what already exists of information and knowledge [1]. In social constructivism, learning is a social process where culture is a factor, and language is used to communicate, negotiate and co-construct knowledge [1, 7, 15, 17]. We focus on knowledge creation in two scenarios, the first being when a person gets help from an older or more knowledgable person to achieve a higher level of understanding. This refers to Vygotsky's Zone of Proximal Development (ZPD). The second scenario can be seen in context of peers with different sets and levels of knowledge, co-creating and developing their understanding by discussing, questioning, and negotiating ideas. Therefore, the teacher should in this setting enable a learning environment where social interaction is central.

The rest of this background section outlines how students perceive the hybrid educational setting and act within it, during the pandemic, and after when the

students returned to campus. This article is particularly interested in investigating, using the theory of social constructivism, how streams, recordings, and other digital communication tools affect the interaction and socialization among students.

2.2 Experiences from the lockdown

The online teaching during lockdown has been found to have both negative and positive aspects. Among the positives, the students had more time to study since they did not have to travel to their study site on campus and were able to manage their own time to a greater extent. This also saves students money. Furthermore, studies became more flexible through recorded lectures, which could be reviewed repeatedly and act as a supplement to actual lectures [6, 9, 12]. In addition, digital learning gives some students more autonomy and pressure to develop a more disciplined study schedule. Recordings are especially mentioned as something that offers students more flexibility in asynchronous learning, something perceived as being more student-centered. Students also feel that taking exams at home is less stressful and recordings are useful in this setting [14].

Negative aspects of the digital learning environment include communication between peers, which became much worse or even absent, something especially prevalent in Zoom breakout rooms. Students reported that their peers would not turn on their cameras, would not speak, or even participate. It is also a wish from the student's side that they want more interactivity and for the teacher to involve students by asking questions, for example, in the chat. However, very few turn on their cameras and few use audio in digital lectures [4,8]. It is easier for the teacher to engage the students sitting in the same physical location since they can see each other, talk to each other, and also observe body language. In addition, being at home is challenging for some students, as it requires much discipline in order to set a good study schedule, considering that their home becomes both their study place and a place for leisure, with all the distractions one may find. This is a challenge that also varies depending on the living conditions of the student [9]. Other negative consequences of online education also include difficulty in concentration, less confidence in academic competence, addiction to mobile phones and social networks during online classes, lack of social contact, and issues with Internet connectivity. There is also a general perception that online teaching is simply of lower quality [3, 9, 12]. Many note the phenomenon of students not turning their cameras on. Explanations include that it is awkward or may be intrusive in their home environment [4, 8].

Some students feel like they become more passive listeners in a digital lecture setting. Students experience that there is a threshold in communicating with others digitally, some giving accounts such that they felt that if they were to ask a question, they felt it had to be really important; this is in contrast to some students reporting that they usually would be too shy to ask questions physically but felt it was easier digitally. Additionally, students would have difficulty grasping certain concepts due to the lack of hands-on experience that they would usually get in lab exercises on campus [14].

Asynchronous learning offers flexibility; however, there is a danger that learning and engagement become an individual affair, instead of a communal affair, as proposed by social constructivism. It is not enough to learn the technical part of delivering a digital learning environment, but there is a need to rethink the entire pedagogical framework. Furthermore, face-to-face integration and discussion in online learning are important for the sake of creating a digital learning environment [5].

2.3 Experiences coming back to campus

Various learning theories, including constructivism, have been used to align the technology-enhanced learning environment with pedagogy, after the pandemic [10]. There are several digital tools that can help enable a collaborative learning environment where students can communicate and share ideas, such as wikis, blogs, discussion forums, and social media platforms. Peer assessment, problem-solving task, and project-based assignments are pedagogical tools to frame the co-construction and negotiation of knowledge which may be assisted through technology. All this indicates that lecturers should consider a blended learning approach [6]. Many students prefer to remain online. However, they also identify a key part of learning to be face-to-face tutorials, workshops, and other activities on campus that allow interaction between peers and between peers and their teachers and tutors, group work, and discussions. For a while, there has been a movement towards the student becoming more than just a participant in higher education but gaining greater agency, that is, the ability to act with a sense of purpose [18]. The digital learning environment has moved from having Learning Management System (LMS) in the center to being one of several tools that allow students to interact and communicate with university staff in a more authentic way, both aurally and visually, and also socially. In addition, creating assessments that foster communication and reflection becomes vital.

Moving back from online to offline classes, students felt they could concentrate better, their stress level was reduced as they experienced entering the full academic environment with their fellow students and teachers, with whom they could now communicate both academically and socially [12]. However, the move back to offline education from online education brought fear of infection, financial concerns due to expenses with transportation and accommodation, and exhaustion due to travelling back and forth to college. Others have found [16] that their students in general were more positive towards online education than offline education after the pandemic. A majority of the students had more difficulty concentrating in online classes and felt that acquiring knowledge, alertness, level of activity, and good grades on exams was better online. Fear of disease, decline in physical activity and fitness, and issues such as loneliness, depression, and isolation may be contributing factors to students' perceptions of online versus offline learning.

Liasidou [11] looks at the situation of virtual learning environments in the context of Universal Design for Learning (UDL), accessibility and education post-Covid-19 in higher education. UDL goes broader than, for example, Web

Content Accesibility Guidelines (WCAG), and includes educational accessibility "regardless of ability, race/ethnicity, and other markers of difference..." (p. 11). There is the possibility of using the infrastructure and experiences made during the pandemic to create accessible and inclusive learning environments, delivering multiple modalities of engagement with the content of the module, through hybrid, asynchronous, and synchronous education. This requires tailoring for individual needs of the students and their learning styles and preferences, for in that manner also cater for those who are in the risk zone of dropping out. Recordings made available can help students who cannot attend synchronous lectures due to financial or health-related problems, so they can continue their education. Looking at this more broadly, there are possibilities for creating learning opportunities in tools such as video conferences where you can include several media as audio, video, chats, and slides. On the one hand, there is a need for flexibility, but likewise some students need help in creating a structure in their study day through timetabled lectures or sessions where students can communicate with each other and faculty - emulating face-to-face interaction and communication. Students who have these needs may have poor self-regulation skills, learning disabilities, or come from disadvantaged backgrounds.

3 Method

We used Nettskjema, a tool developed by the University of Oslo, to collect data. This is designed to make it easier to comply with various privacy and data protection regulations, primarily by anonymizing data. The questions asked in the survey were developed based on collaboration, communication and experiences related to digital teaching, focusing on the changes we and our colleagues, lecturers in higher education, have experienced after the Covid-19 pandemic. The findings in this paper are based on four free-text questions interspersed among quantitative questions. The questions covered topics such as experiences and preferences regarding digital teaching, physical versus digital teaching, streaming, and recording of lectures. Many of the respondents provided comments on their experiences and views on physical versus digital teaching.

We conducted the survey among bachelor's students in Information Technology (IT), in their first, second, and third year. To contact the students, we presented our study during a lecture and then provided them with a link to the online survey questionnaire. The survey was conducted in December 2022-February 2023 and closed with 420 respondents. Of these, 176 respondents wrote free text responses. For the rest of this text, we consider only the 176 respondents who wrote text responses. Quantitative analysis of the other responses is presented in another paper. At the time of data collection, the last restrictions in Norway due to the pandemic had ended almost a year ago, 12 February 2022 [13]. The students were told that participation was voluntary and that the responses were completely anonymous. A member of the research team was present when the survey was conducted, typically in a classroom setting, and was available if anyone had questions or comments.

Among the respondents who participated in the survey, 35% of those who provided free text responses were women, 63% were men and 2% were other genders or did not want to state their gender. In terms of age, the distribution is as follows: 18-23 years = 38%; 24-39 years = 35%; 30-39 years = 26% and 40 years or older = 2%. The three years of bachelor's degree were represented; 45% are in the first year, 41% are in the second year, 14% are in the third year. Furthermore, we were interested in the extent to which the respondents had experience with digital teaching during the pandemic. 62% had experience with digital teaching to a very large extent or to a large extent, 18% have medium experience and 20% have little or very little experience with digital teaching.

We have used thematic analysis as described in [2] as the process to analyse the responses of our participants. We performed the analysis as inductively as possible, as we wanted to explore how the situation is now, without being too colored by our finding on how it was during the pandemic. When we noticed that we had lost track of our thoughts, we explored alternative ways to understand the data. The process of creating and refining codes and themes started with one of the three researchers creating a first draft of codes, and then the three met to discuss, refine, and find alternative codes and themes.

4 Findings

Table 1. Codes and themes from the qualitative analysis.

Theme	**Codes**
Perceived quality of online and physical teaching (Section 4.1)	Physical study environment when digital is available
	Zoom teaching not worth the price
	Digital teaching is lower quality
	Lecturers' engagement in digital teaching
Digital tools give freedom to students (Section 4.2)	Digital teaching gives flexibility
	Commuting and saving time
	Commuting, job, and saving money
Ability to focus and learn (Section 4.3)	Study environment at home
	Universal Design/Facilitation
	Content determines the right format
Digital tools as learning resources (Section 4.4)	Recordings as a resource
	Chat
Human and social implications (Section 4.5)	Getting out of bed in the morning
	Social life as a student

After the detailed analysis, we were left with five broad themes, summarised in table 1. We will present and elaborate on each in the following subsections. It is also clear during reading responses that the questions did not clearly distinguish between streaming and recording as the *only* options for participating in a

recording as it was during lockdown, and these tools as *supplemental materials* to traditional physical participation. Most responses make it clear which option they are talking about, but not necessarily all.

4.1 Perceived quality of online and physical teaching

It is clear that many of our respondents consider online teaching to be a supplement rather than a true alternative to physical teaching. Some students perceive online teaching as an emergency measure used during the pandemic, not a true replacement. Although students perceive variable quality between teachers, they generally find online teaching to be worse. Some students find online teaching superficial, while physical teaching goes deeper and is more serious. Our respondents generally do not explain why they have this feeling, other than that teachers may be better prepared for physical teaching. Because we are a private institution, we are charging tuition as opposed to most Norwegian institutions, and some respondents directly say that online teaching is not worth the price and could then rather apply for full online education.

4.2 Digital tools give freedom to students

In spite of the perceived lack of quality in streams and recordings, as supplementary alternatives, they are considered important. Some students have other places outside campus they perceive as better suited for studying, and some mention getting more sleep. Others have children or jobs that make consistent participation on campus tricky. In this regard, one participant states:

"I would never have managed to complete this study without the possibility to watch lectures live and again later."

Travel time is another important issue; some say that their longer commutes make them more inclined to want to participate remotely. Avoiding travel times gives some both more time to study and for other activities. Some students also mention the economic benefit of saving money on transport fare. A number of students work while studying, some even have full-time jobs, and sometimes are unable to attend lectures. In the context of the job situation, there are some comments about the economic situation becoming more difficult during and after the pandemic. One example: "Digital lectures work better for me who commutes 1.5 hours each direction to campus. It also saves money."

The recordings can also be used to participate in the lecture at any time. As one respondent explains: "Digital teaching gives an opportunity to participate in teaching despite illness or other challenges life can offer." In general, the ability to participate in teaching at any time and anywhere is highly regarded among our participants, even if they strongly prefer physical teaching as the *primary* way of participating.

4.3 Ability to focus and learn

Some students have various health-related challenges that make it difficult to participate in teaching on campus. While our campus buildings are designed with

universal access in mind, some features of campus design cannot be changed and are inherent in the very concept of a campus. One such feature is the presence of other people, with the aural and visual distractions that this creates. Our respondents explicitly mention social anxiety and issues, such as ADHD, related to concentration difficulties. Some mention physical pain. Those with concentration issues mentioning that it sometimes is more effective to study at home, or opposite: hard to study at school. There may be fewer distractions or other people to worry about. Even people without particular challenges may sometimes or often feel that distractions and secure access to a quiet and comfortable workspace may make working from home preferable.

In contrast to the above-mentioned, many respondents report better focus and learning on campus, including in context of working in the same physical locations with their peers. At home you have all your usual hobbies and entertainment available to distract you. Being physically present in a campus environment provides motivation and encouragement to focus on your studies and be more mentally present. A respondent explains how travelling to campus gives a boost of effort and presence and refers to "100% communication where you can read body language, voice, and energy from the lecturer and students." Another respondent notes about physical lectures "...I feel I take school more seriously when you have to meet at a certain time and place," while another student writes about digital lectures, including recordings that it becomes easy to postpone watching a lecture. A student makes a point about that the topic decides if online or physical is a better fit, writing that the more complex and difficult concepts should be taken in a physical environment.

The context switch of studies or free time becomes much clearer when you also change the physical environment. You also have easier access to other people working on the same topic and the possibility to do group work and reflect together in the lab exercises after the lectures. The threshold to contact someone and ask about the curriculum is higher when it involves sending a message or calling. Furthermore, some feel lonely at home, something that can have a detrimental effect on studies.

4.4 Digital tools as learning resources

A recorded lecture may be viewed many times, may be paused, re-wound, and watched at a different speed from the original lecture. For some students, the contrast is that without a recording, you only get one shot at getting it! A recording allows students to understand the content at their own pace when they need to. Students may stop the recording to take notes, or they may replay a specific segment when stuck on lab exercises to better understand a certain concept. Recordings may also be used as a backup solution if they cannot attend lectures. While students are well aware of the advantages of having a live lecture where they can ask questions and interact, they also appreciate recordings.

As one student puts it: "Prefer physical, however you do not always catch everything. So if the lectures are recorded and made available, digital is clearly better! I used to see lectures multiple times during covid and felt that I followed

the teaching much better when I used the recordings continuously. I have some trouble focusing, so recordings are perfect."

Note that digital lectures do not necessarily include recordings; however, the two are linked in the minds of the students. This is because we, as an institution, have had the habit of giving them recordings of digital lectures but not of physical lectures. Probably because the infrastructure for streaming and recording was set up during the pandemic, and information meetings and workshops were held presenting both streaming and recording as a standard, making the logistics involved much simpler. Thus, recordings of lectures, although not previously unheard, began appearing with much more consistency during lockdowns.

In addition, students mentioned chat functions in the online teaching tools as an important resource. This allows questions to be asked unobtrusively, and sometimes they are even answered by other students before the lecturer even sees them. This significantly lowers the threshold for asking questions. Conversely, the chat might become a distraction if there is too much happening at once, particularly off-topic discussion. The respondents mention that the teacher needs to administer the chat properly to maintain the quality of it; otherwise there can be a lot of spam. The teacher must also not get distracted by it, and use time on unnecessary comments and questions during the lecture.

4.5 Human and social implications

Somewhat in contrast to the improved flexibility of online learning, some students feel that the rigidity of having a set time and place to meet for lectures is an advantage. It motivates them to get out of bed and get dressed. The commute also provides students with the opportunity to have fresh air and a change of scenery. One participant remarks: "Simply having to go out the door in the morning and getting some sunshine contributes to more presence during the lecture." A lack of physical lectures also contributes to the disconnect from the social life that comes from meeting fellow students. It becomes harder to meet other students, make friends, and maintain connections. One participant says: "Because of digital teaching it is hard to get to know others. I have very few friends in my study program." Meeting peers at school is a social event that makes students feel happier in their studies. For a student, school may be an important part of their social life. Some acknowledge the importance of going to school both for the sake of learning and socialising, but also admit that they find it a challenge to change their habits from the pandemic, when everything was digital, and when streaming and recordings are still available. A student writes that they must make an effort to go out, else they may just stay at home because "...it is so easy and comfortable. And absolutely not good for learning and social life."

5 Discussion

5.1 The digital versus physical constructivist learning environment

Our findings show that the great majority of students prefer physical lectures over digital ones. In the background chapter, we found only one research article [16] in which students strongly prefer to continue online education. It is important to note that a physical lecture for students is more than just hours in the auditorium, that is, the traditional lecture. The physical lecture represents structure, motivation to leave the house, and not least the possibility of interacting with peers before, during, and after the lecture. Several authors such as [3, 5, 9] mention how communication with peers, student assistants, and teachers is strongly lacking in a pure digital learning environment, which disrupts the co-construction of knowledge. Traditional lecture in its basic form, where only the teacher speaks and "transmits" knowledge to passive students, is on the opposite pedagogical end of social constructivism [19]. However, there has been a movement at our institution for years for making the classroom more student-centered by the teacher letting students use time during lectures to answer questions, do tasks, discuss with their peers, and have class discussions. The students want the teacher to involve them [9]. One could think that technology would make an effective alternative, as positively proposed in some of the literature [10, 11], but the reality appears to be that a digital learning environment increases isolation. However, our background chapter does not attempt to differentiate between results between larger and smaller classes or different cultures.

Based on our findings and the literature [3,9,14], it seems that Zoom lectures can quickly revert to teacher monologues, and after the lecture is over, the students are left to themselves. In theory, tools such as Zoom breakout rooms where students can discuss in groups with video, audio, screen share, and text chats would be a good alternative to face-to-face collaboration in physical locations. However, the literature shows that students were strongly reluctant to interact with others digitally during the pandemic, among others due to fear of exposure. The students' cameras are not turned on, and they do not use their microphone so they neither see or hear each other.

Several of our respondents mention that they feel they miss working together with their peers on campus and how focus and learning improve in the physical setting. Framing the discussion of the students meeting physically at school, for example in lab exercises after a lecture, in a social constructivist setting, sees this as a social setting where students may negotiate and co-construct their reality and knowledge. Technology subjects such as programming have tasks which can be solved in many different ways, and there does not need to be one truth as to which is the best way. An isolated student does not receive feedback on their understanding from their peers, student assistants, and teachers. When a student works by themselves, they may construct their knowledge, their construction of reality, in only one manner of thinking about what is right or wrong, or become very dependent on the teacher's "truth", as presented in lectures. Students

sharing ideas and thoughts on how a task should be solved makes the learning more student-centred through discussion and negotiation of what is "right" or "wrong", or "better" or "worse". One of our respondents mentions how learning through discussion creates stronger memories. We may also add more meaningful knowledge, since the students may learn different ways of thinking. Thinking back on Vygotsky and ZPD, students and their peers, in addition to teachers and student assistants, can become the more knowledgeable other person which helps them achieve a higher intellectual level of understanding; something which may not be possible individually.

5.2 Perceived quality of online versus physical teaching

The students perceive the quality of digital lectures to be lower than that of physical lectures. Students do not very clearly explain why they think so; however, some there are some indications. Some of the students mention the teacher's engagement and how in-depth the teachers go into the material presented when presenting in streams. Some students note that the lectures become more superficial, which may be an effect of the teachers moving away from including peer-to-peer activities during their lectures, to using streams more as a means to simply present information. In addition, since we are a private institution where students pay tuition fee, students may feel that they get more for their money in a more organised setting such as a physical lecture with lab exercises can be, with direct access to teachers, student assistants, peers, IT support, and other instances at school.

5.3 The pedagogical role of recordings

Our findings show that most respondents prefer having both physical lectures and recordings, and the literature shows how students greatly appreciate recordings [3, 5, 12]. We should consider the pedagogical implications of recordings on the learning environment. The students see recordings as a very important resource which offers flexibility regarding when and where to learn, and the possibility to watch complex lectures multiple times.

A common concern about offering recordings is the likelihood of students not attending physical lectures and participating in group work. As previously mentioned, the digital lecture seems to remove several possibilities for learning in social settings. What does it mean for the student's learning when they replace learning in a social setting with watching and re-watching recordings? Will recordings lead to some students' learning moving from being student-centered to teacher-centered in the sense that students are more dependent on the teacher's recording and may fall into cramming the recording content, instead of doing more deeper learning in a social setting?

In contrast, recordings may not always end up with isolated students. As one respondent mentioned, recordings may be a way for students who could not attend a lecture to get up to speed before working with their peers, for example, on project exams. Students may move back and forth between constructing

knowledge individually, making use of recordings, and participating with their peers in group work and discussions.

5.4 Hybrid education and Universal design and freedom

Hybrid delivery makes education more accessible to students with different needs, as described by Universal Design for Education. Digital lectures and recordings let students study at their own pace, and convenience. It may save students in the risk zone from dropping out of college due to medical problems, job, family, and other issues that make attendance difficult. Some students have to commute longer than others, one of our respondents wrote that they use 1.5 hours each way, and this is something that takes up time from studying and other activities, something we also find in the literature [6, 12, 14]. Without travel time, some students see benefits both in terms of better time management and more time for their studies [9, 12, 14]. If a student in their first year of Bachelor's degree gets ill for a couple of weeks, they may lose as many as 10 lectures, which may be very hard to catch up on later. Especially considering that the next lectures may build on the previous. Recordings, in combination with other material, may allow the student to study while ill at home.

The ability to focus is something that differs between students. Some students in our findings and in the literature [11,16] state that they find it difficult to focus at school due to having to be among other students and the distractions that follow. On the other hand, we have students that feel their ability to concentrate and learn in a pure digital environment is reduced [6, 9] and even stress levels are reduced [12]. For those who may concentrate better at home, distractions are visual and aural from students moving around in and out of class, or things such as students speaking or eating during the lecture. Having the possibility to view the lecture as a stream or watch a recording gives the student who feels they would like to study alone that option.

However, it must also be mentioned that some students may have lower self-discipline, learning disabilities, and more easily fall into distractions at home [6, 9,11], so physical lectures and campus work sessions become a help for them, and this shows how needs go both ways with respect to online education versus offline education. Additionally, students may have very different levels of knowledge before entering higher education, making some students have to spend more time on certain subjects than others to understand them. A recording offers students who need it the ability to replay a specific part of a recording as many times as possible. This need may also come from, as some students mention, that some teachers may go too fast through certain topics in class, or explain things in manners which require more than one listening. One can also discuss that recordings may give students the opportunity to focus more on in-depth learning, instead of having that "one shot" at getting all the teacher says, trying to also note down everything.

Online lectures usually allow for a text-based chat in addition to voice and video communication. We found that a chat may be a good tool to remove the barrier that lies in raising one's hand in a bigger group of people. Instead,

students may post questions anonymously if preferred, which the teacher or peers may answer. This effect works in small groups. In larger lectures, there should be a moderator who deletes spam and preferably forwards questions to the lecturer at appropriate moments.

6 Conclusion

We conclude that hybrid teaching, especially recordings, offers students greater flexibility compared to only on-campus teaching, and is greatly appreciated by students. Recordings allow for re-watching lectures at the speed and time of convenience. Hybrid lectures also make education accessible to various groups of students with individual needs. However, students acknowledge that they experience better learning and focus during physical lectures. Attending physical lectures at school affords the students structure in their daily life, additionally, for some it even serves as a purpose to go out of the house. Going to campus gives students the opportunity to interact with peers; an important part of their learning process. Students perceive that the quality of teaching is higher during physical lectures compared to those during digital lectures. An explanation for this may be that lecturers are not professionally trained to deliver digital lectures. The benchmark may be content creators students encounter on platforms such as YouTube, delivering content in a format professionally tailored for streaming. While hybrid education brings flexibility, we see some unresolved issues. Among these, what the institution and individual lecturer should do when they notice declining attendance. We know this may result in students not meeting their peers, student assistants, and teachers, and hindering co-creation of knowledge.

We see a potential for further studies within the field, to gain deeper understanding of how digital tools affect the students' learning processes and outcomes, and the learning environment as a whole. For example, one may study the correlation between the availability of lecture recordings and attendance in physical education. Additionally, interesting questions remain about how students actually use recordings and whether there is a connection with student performance. Furthermore, findings from this study may be used to develop an interview guide that may provide a deeper understanding of how students experience different forms of teaching contexts.

References

1. Amineh, R.J., Asl, H.D.: Review of constructivism and social constructivism (2015), https://api.semanticscholar.org/CorpusID:27273145
2. Braun, V., Clarke, V.: Using thematic analysis in psychology. Qualitative Research in Psychology **3**, 77–101 (01 2006)
3. Buckley, K., Stone, S., Farrell, A.M., Glynn, M., Lowney, R., Smyth, S.: Learning from student experience: large, higher education classes transitioning online. Irish Educational Studies **40**(2), 399–406 (2021). https://doi.org/10.1080/03323315.2021.1916566

4. Castelli, F., Sarvary, M.: Why students do not turn on their video cameras during online classes and an equitable and inclusive plan to encourage them to do so. Ecology and Evolution (01 2021). https://doi.org/10.1002/ece3.7123
5. Colreavy-Donelly, S., Ryan, A., O'Connor, S., Caraffini, F., Kuhn, S., Hasshu, S.: A proposed vr platform for supporting blended learning post covid-19. Education Sciences **12**(7) (2022). https://doi.org/10.3390/educsci12070435
6. Fang, J., Pechenkina, E., Rayner, G.M.: Undergraduate business students' learning experiences during the covid-19 pandemic: Insights for remediation of future disruption. The International Journal of Management Education **21**(1), 100763 (2023). https://doi.org/10.1016/j.ijme.2023.100763
7. Ghulam, M., Muhammad Kundi, G., Nawaz, A.: From objectivism to social constructivism: The impacts of information and communication technologies (icts) on higher education. Journal of Science and Technology Education Research **1**, 30–36 (08 2010)
8. Gonzalez, R., Sandnes, T., Fagernes, S.: Student perspectives on the digital learning experience during COVID-19 lockdown . ECEL - 20st European Conference on e-Learning pp. 203–209 (2021)
9. Gonzalez, R., Sørum, H., Raaen, K.: Emergency digital teaching during the covid-19 lockdown: Students' perspectives. Education Sciences **12**(3) (2022). https://doi.org/10.3390/educsci12030152
10. Lamtara, S.: Faculty's pedagogical knowledge for technology-enhanced learning in higher education. International Journal of Higher Education Pedagogies **4**(2), 1–24 (Jul 2023). https://doi.org/10.33422/ijhep.v4i2.412
11. Liasidou, A.: Inclusive pedagogies in digital post-covid-19 higher education. British Journal of Special Education **50**(1), 6–27 (2023). https://doi.org/10.1111/1467-8578.12436
12. Maya, M., Anjana, V., Mini, G.: University students' perceptions of shifting between online and offline learning: lessons from kerala, india. Asian Association of Open Universities Journal (12 2022)
13. Ministry of Health and Care Services, Norway: Tidslinje: Myndighetenes håndtering av koronasituasjonen. https://www.regjeringen.no/no/tema/Koronasituasjonen/tidslinje-koronaviruset/id2692402/, accessed: 2010-09-30
14. Munir, H.: Reshaping sustainable university education in post-pandemic world: Lessons learned from an empirical study. Education Sciences **12**(8) (2022). https://doi.org/10.3390/educsci12080524
15. Orey, M.: Emerging Perspectives on Learning, Teaching, and Technology. The Global Text Project (2010)
16. Riaz, F., Mahmood, S.E., Begum, T., Ahmad, M.T., Al-Shaikh, A.A., Ahmad, A., Shati, A.A., Khan, M.S.: Students preferences and perceptions regarding online versus offline teaching and learning post-covid-19 lockdown. Sustainability **15**(3) (2023). https://doi.org/10.3390/su15032362
17. Saleem, A., Kausar, H., Deeba, F.: Social constructivism: A new paradigm in teaching and learning environment. PERENNIAL JOURNAL OF HISTORY **2**, 403–421 (12 2021). https://doi.org/10.52700/pjh.v2i2.86
18. Sankey, M.: The state of australasian online higher education post-pandemic and beyond. Journal of University Teaching and Learning Practice **19**, 14–26 (04 2022). https://doi.org/10.53761/1.19.2.2
19. Wilson, B.G.: Constructivist Learning Environments: Case Studies in Instructional design. Educational technology Publications. (1996)