

UNIVERSITY STUDENTS AND TEACHERS' EXPERIENCES WITH DISTANCE EDUCATION IN UZBEKISTAN

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ABSTRACT

This study has examined the experiences of students and teachers with distance education in Uzbekistan during the COVID-19 pandemic. Distance education is a new field in Uzbekistan, and evidence-based practices should be examined for its successful implementation. A convergent mixed-methods design was used, employing surveys and focus group interviews. The survey data was analyzed using descriptive and inferential statistics, and the focus group interview data was analyzed using thematic analysis. The results revealed that students and faculty had both positive and negative experiences with distance education, but also suggested that teachers were more self-efficacious in teaching online rather than students learning online. This exploratory study indicates that students need targeted instruction and support on studying online and self-regulate their learning. Teachers should participate in intensive professional learning workshops on materials design and pedagogical practices in online classes. Practical applications and ideas for future research are discussed.

Keywords: distance education; self-efficacy; TPACK; learning management system; mixed methods research

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INTRODUCTION

The COVID-19 pandemic has had unprecedented effects on education and learning, including school closures, increasing dropout rates, and developing new technologies to promote equitable and inclusive education (Crawford et al., 2020; Giannini & Albrechtsen, 2020). Governments and international organizations have worked hard to alleviate the detrimental effects (Laufer et al., 2021; World Bank, 2020). The government of Uzbekistan was quick to respond to the COVID-19 pandemic. For example, the National TV and Radio Company has been broadcasting lessons for school

children, and higher education has adopted learning management systems (LMS) such as Blackboard or Moodle and videoconferencing software such as Zoom.

Information and communications technology (ICT) has been introduced in developed countries since the mid-twentieth century (Lowyck, 2013). Studies have explored various aspects of distance learning, including its effectiveness, challenges, and best practices (Ally, 2008; Kebritchi et al., 2017; Al-Balas et al., 2020; Gurajena et al., 2021; Kusmaryono et al., 2021). Developing countries have been trying to catch up with ICT development steadily. However, COVID-19

caught the world's ICT competitiveness off guard. However, online education, where anybody can access quality education and grow professionally and personally from anywhere in the world at their own pace, has been booming since the pandemic. Many prestigious universities now offer their courses - Bachelor's, Master's, and even PhD degrees - online. To benefit from this post-COVID new normal, exploring the essentials for online learning success is crucial. While much research has concentrated on the technological aspects of distance learning, there is a need to pay attention to self-efficacy support that teachers and students might require to embed new experiences in their routines. This study investigated what support besides training on using technology is needed for students and teachers to get effectively involved in distance education. This study's novelty is its mixed-methods research approach, and it focuses on students' and teachers' self-efficacy beliefs regarding distance education. The research findings provide insights for practitioners and policymakers on improving the quality of distance education produced in Uzbekistan (and other countries) and how students can better consume both domestically and globally provided learning opportunities.

LITERATURE REVIEW

Countries have responded to distance education during the COVID-19 pandemic with varying degrees of success. For example, access to technology and reliable Internet connection seemed to be a reoccurring challenge in higher education across the globe. Cullinan et al. (2021) reported that around 16.6% of the student population in Ireland had a poor Internet connection. Very similar experiences were reported in South Africa (van Wyk, 2020), Malaysia (Azlan et al., 2020), Brunei (Shahrill et al., 2021), the U.S. and Canada (Laufer et al., 2021), and Turkey (Karadag et al., 2021). Universities in Brunei, U.S., and Canada attempted to alleviate this challenge by lending laptops, creating Internet hotspots, or providing students with SIM cards (Laufer et al., 2021; Shahrill et al., 2021). Researchers evaluated students' experiences with distance education and reported mixed findings in Turkey (Karadag et al., 2021) and in the U.S. (Ives, 2021). Still, there were also positive reports on distance learning. For example, 61% of Nepal university

students (N=158) appreciated the flexibility of online education (Gautam & Gautam, 2021). Flexibility, however, does not necessarily lead to effective mastering. High school students in New Zealand (N=1975) noted they did not have enough control over learning, while others complained they were assigned more tasks than during the pre-COVID era. Only 10% were willing to study online (Yates et al., 2020). Unexpectedly, Australian students acknowledged it was easier to contribute to discussions online, as it was harder for active learners to dominate. Many felt more secure expressing their opinions and asking questions online, and most online learners admitted to better performance overall than in traditional classes (Woodcock, 2015). This indicates that the self-efficacy component of distance learning requires the attention of researchers and practitioners.

In terms of teacher experiences, the results also are conflicting. For example, Lee and Jung (2021) indicated that educators changed their teaching behaviors and use of technology, but very small changes to their beliefs about online teaching. Hence, the lack of interaction was the most negative aspect of teaching online (Yates et al., 2020). Research examining teachers' online teaching expectations and experiences during the COVID-19 pandemic in the Netherlands (N=200) found that the interaction problem was even greater (46% of respondents) than a majority of teachers expected (38%) in a pre-test (van der Spoel, 2020). This is followed by increased time pressure and workload among Dutch teachers (van der Spoel, 2020).

The literature review shows mixed experiences with distance education during the pandemic. This paper adds to existing research by examining students' and teachers' experiences with digital education through the Technological, Pedagogical, and Content Knowledge framework (Koehler & Mishra, 2009; Mishra, 2019) in Uzbekistan.

The Technological, Pedagogical, and Content Knowledge (TPACK) approach operates within three domains - technology, pedagogy, and content - to promote technology-enhanced teaching (Koehler & Mishra, 2009). In TPACK, content knowledge refers to teachers' comprehensive knowledge of the domain, pedagogical knowledge is the knowledge of teaching and learning processes, and technological knowledge is a developed

knowledge of technology. TPACK posits that all three components are intertwined and interact with each other to promote successful technology-infused teaching and learning. The use of technology should be constructive: Teachers should know what types of technology promote or impede learning. Moreover, because TPACK is discipline-specific, technological, pedagogical, content, and contextual knowledge will vary.

TPACK is a well-researched theoretical framework (Rosenberg & Koehler, 2015). Research evidence suggests that the use of TPACK in teacher preparation programs enhances pre-service teachers' use of it (Rosenberg & Koehler, 2015; Wang et al., 2018). However, research on the effects of TPACK on student learning and achievement is inconclusive (Koh et al., 2017). While TPACK was not specifically developed for distance education, it fits this study's purposes, as it focuses on integrating content, pedagogical, and technological knowledge to promote learning.

Not only does the technological part underpin successful student experience with distance education, but this study also measures their self-efficacy. Self-efficacy refers to people's belief in successfully tackling a task (Anderman & Wolters, 2008). Learners' self-efficacy is related to their engagement with a task and the types of strategies they use (Bandura, 1994; Pajares, 2002). High self-efficacy tends to be a strong predictor of student achievement and success across domains and ages (Schunk & DiBenedetto, 2016).

Research on self-efficacy for online learning seems to be inconclusive in terms of computer, internet, and LMS self-efficacy (Alqurashi, 2016). Given the abundance of research in other domains indicating the effects of self-efficacy on student achievement (Schunk & DiBenedetto, 2016), measuring self-efficacy for online learning is of utmost importance. Regarding online teaching, Horvitz et al. (2015) reported faculty's high levels of self-efficacy to teach online.

This article examines students' and teachers' experiences with distance education through the lens of the TPACK framework. Specifically, it addresses the following research questions:

- What are students' and teachers' experiences with distance education?

- What are students' self-efficacy levels for studying online?
- Are there differences by major, level, age, and gender?
- What are teachers' self-efficacy levels in teaching online?
- Are there differences by department, rank, role, age, gender, and preferences regarding online teaching?
- What are students' and teachers' perceptions of distance education?

METHODOLOGY

Research Design. The convergent mixed-methods design was used in this exploratory study (Creswell & Clark, 2017) by administering student and teacher surveys and conducting focus group interviews shortly after. These methods allowed for measuring the breadth and depth of participants' experiences with distance education.

Setting. The study was conducted at an international university in Uzbekistan. The university is the first top-ranked university in Uzbekistan, with a 40% admission rate. It offers undergraduate and graduate degrees in information systems, business, finance, economics, commercial law, and education. In Fall 2020, the student body included 4,659 students at the foundation (N=1,330), undergraduate (N=3,034), and postgraduate (N=295) levels. At the time of the study, the university faculty included 175 members.

Participants. The survey sample included 742 students; 41% (n=304) of the sample were females. Most of the sample (75%) were undergraduate students, representing all five undergraduate programs (Table 1). The focus group interviews were conducted with a small sample of students (n=10). Seven of the students were male.

Table 1. Demographic Characteristics of Students.

	November 2020; n=742
Certificate	n=107 (14.42%)
Undergraduate	n=554 (74.66%)
Postgraduate	n=44 (5.92%)
Skipped	n=37 (4.98%)
Undergraduate	

Business Information Systems (BIS)	n=79 (10.64%)
Finance	n=40 (5.39%)
Economics with Finance	n=175 (23.58%)
Business Management	n=153 (20.61%)
Commercial Law	n=108 (14.55%)
Postgraduate	
MSc in Applied Economics	n=42 (5.66%)
Postgraduate Certificate in Teaching and Learning	n=12 (1.62%)
MA in International Business Management	n=50 (6.79%)
LLM in International Commercial Law	n=23 (3.09%)
MSc in Business Intelligence and Analytics	n=14 (1.89%)
MA in Human Resource Management and Talent Development	n=11 (1.48%)
Skipped	n=35 (4.70%)
Level	
Level 3	n=221 (29.78%)
Level 4	n=191 (25.74%)
Level 5	n=109 (14.69%)
Level 6	n=138 (18.59%)
Level 7	n=18 (2.42%)
Skipped	n=65 (8.76%)
Age	
Under 18	n=84 (11.32%)
18-24	n=569 (76.68%)
25-34	n=20 (2.69%)
35-44	n=4 (0.54%)
Skipped	n=65 (8.76%)
Gender	
Female	n=304 (40.97%)
Male	n=373 (50.26%)
Skipped	n=65 (8.76%)

Source: authors' work.

Seventy-three teachers responded to the survey (43% female). Most of the teachers held lecturer positions. Thirteen faculty members participated in the focus group interviews across the law (n=4), business and marketing (n=7), finance (n=1), and global education (n=1) departments. The faculty from the economics and IT departments did not participate. Five of the interviewed teachers were female.

Table 2. Demographic Characteristics of Faculty.

	November 2020, n=73
Academic Role	
Head of Department	n=6 (8.21%)
Course Leader	n=5 (6.85%)
Module Leader	n=38 (52.05%)
Other	n=21 (28.76%)
Skipped	n=3 (4.11%)
Academic Rank	
Associate Lecturer	n=16 (21.92%)
Lecturer	n=27 (36.98%)
Senior Lecturer	n=24 (32.87%)
Principal Lecturer	n=1 (1.37%)
Associate Professor	n=2 (2.74%)
Professor	0
Skipped	n=3 (4.11%)
Department	
Management & Marketing	n=15 (20.54%)
Economics	n=5 (6.85%)
Finance	n=14 (19.18%)
Law	n=8 (10.95%)
Computing	n=5 (6.85%)
Global Education	n=23 (31.51%)
Other	0
Skipped	n=3 (4.11%)
Age	
Under 18	0
18-24	0
25-34	n=28 (38.36%)
35-44	n=29 (39.73%)
45-54	n=9 (12.33%)
55-64	n=2 (2.74%)
65+	n=1 (1.37%)
Skipped	n=4 (5.47%)
Gender	
Female	n=31 (42.46%)
Male	n=38 (52.05%)
Skipped	n=4 (5.47%)

Source: authors' work.

Instruments. Quantitative data were collected using teacher and student online surveys, while qualitative data were collected using student and teacher online focus group interviews. The instruments were complementary, allowing for the triangulation of methods.

The student survey included 19 questions focused on technology, challenges, students' self-efficacy to study online, and demographic information (Appendix A). The technology

questions asked students about the types of technology they used to access online classes. The challenges questions asked students to report technology and learning-related challenges while studying online. All these questions were Select All That Apply for a complete picture of students' experiences. The four self-efficacy items came from the self-regulated learning assessment of the Diagnostic Assessment and Achievement of College Skills (DAACS, n.d.), and asked students to report on their confidence to learn online on a 5-point Likert-type scale (0 – Strongly Disagree to 4 – Strongly Agree; $\alpha=.89$). The demographic information included students' level of studies, major, age, and gender.

The teachers' survey included 20 questions organized around topics similar to the student survey: technology, challenges, teachers' self-efficacy to teach online, and demographic information (Appendix B). Technology questions focused on the types of technology they used when teaching online. In terms of challenges, teachers also reported on the technology and teaching-related challenges in online environments. The self-efficacy items ($n=6$) were designed to measure teachers' confidence in teaching online and using university technology available on a 5-point Likert-type scale (0 – Strongly Disagree to 4 – Strongly Agree; $\alpha=.84$). The demographic information asked about the teachers' role at the university (i.e., head of the department, module leader, etc.), academic rank, department, age, and gender.

The article's first author constructed the items for both surveys based on intensive conversations within the Digital Learning Workforce at the university. The workforce included representatives of faculty and administration who had experiences with teaching at the university both in person and online. The items about technology used to teach and study online were constructed based on availability and access within the university and the Uzbekistani context. Similarly, items about learning and teaching-related challenges were constructed based on the overall personal experiences of faculty members and some of the students. Before collecting data, the items were modified by the members of the Digital Learning Workforce and some students/teachers.

Focus group interviews with students included ten questions (Appendix C) and focused on

similar topics as in the surveys: most and least favorite parts of online learning, types of features used in LMS, support that they needed to succeed in online classes, changes in teaching and learning, suggestions on how to make online learning better, and if they considered taking online classes in the future. Similarly, focus group interviews with teachers included nine questions (Appendix D), and focused on the same topics as the students' questions but from the teacher's perspective. The questions for the focus group interviews were designed based on discussions within the Digital Learning Workforce. The items in the survey and focus group instruments map well onto the TPACK framework because they cover the technology and pedagogy in distance education but less so content.

Procedures. The data collection occurred during the fall 2020 semester because classes were offered online for the first eight weeks. Toward the end of November 2020, classes at this university were switched back to and remained in a face-to-face mode. Student and teacher surveys were distributed at the beginning of November 2020, and participants had ten days to respond. All survey data were collected online using Survey Monkey (n.d.). After an initial email, two more reminders were sent on the fifth and the eighth days, which increased response rates. The second author conducted focus group interviews with students in mid-November 2020, and the first author conducted interviews with faculty at the end of November 2020. All focus group interviews were conducted online.

Data analyses. Descriptive and inferential statistics in R Studio were performed on survey data using *offside* (Torchiano, 2020), *psych* (Revelle, 2021), and *coefficient alpha* (Zhang & Yuan, 2020) packages. Only complete observations were used for the inferential analyses. Thematic analyses were used for the interview data (Maxwell, 2013). First, the interviews were transcribed using Otter.ai and checked for accuracy. Then, two raters (i.e., the authors of this paper) coded all focus group interviews to identify students' and teachers' perceptions of online learning and teaching. The coding procedures included (1) identifying meaningful units, (2) coding and refining the codes, (3) narrowing down the codes, and (4) making interpretations and looking for meanings.

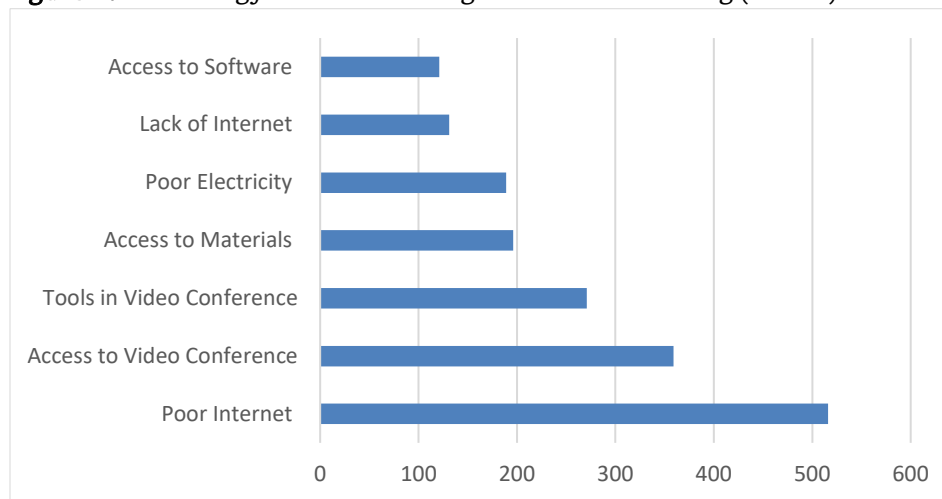
RESULTS

What are students' and teachers' experiences with distance education?

Students' Experiences. To access online classes, students mostly used computers (n=692), followed by mobile phones (n=262), and tablets (n=22). When asked about what functions of a video conference (VC) were used the most, students reported using public chat (n=680), breakout rooms (n=370), and shared screens

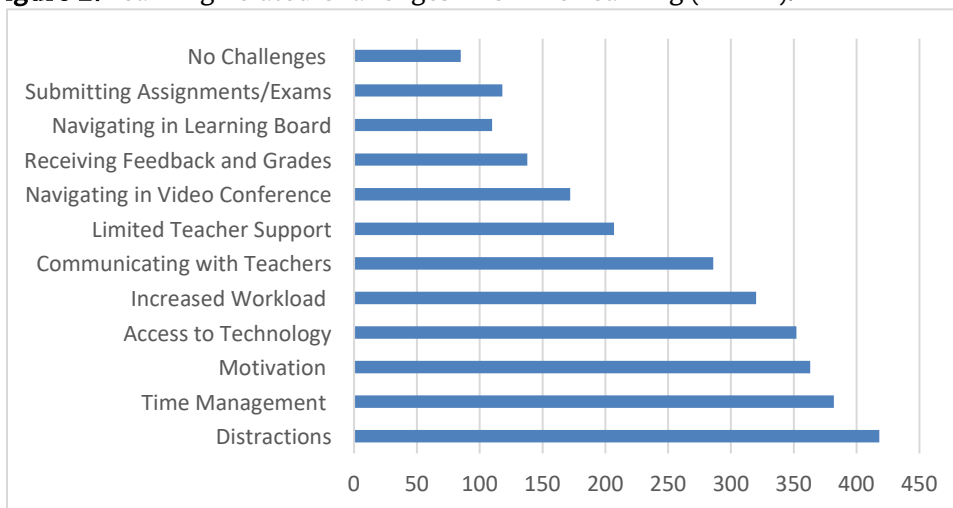
(n=308). In terms of the Learning Board (LMS), students used video conference (n=660), lessons (n=625), and assignments (n=197). The most pressing technology-related challenges were poor internet connection (n=516), accessing Big Blue Button (BBB; n=359), and using tools within BBB (n=271; Figure 1). In terms of the learning-related challenges, students reported that distractions (n=418), time management (n=382), and motivation (n=363) were the most serious ones (Figure 2).

Figure 1. Technology-related Challenges in Online Learning (n=742).



Source: authors' work.

Figure 2. Learning-related Challenges in Online Learning (n=742).



Source: authors' work.

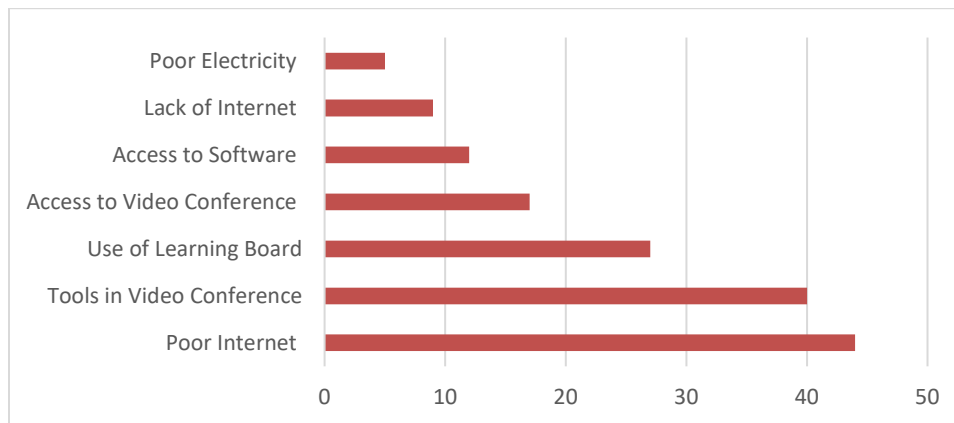
The descriptive analyses suggest that students ($n=677$) reported low levels of self-efficacy to study online ($M = 1.66$, $SD=1.09$). The results of the Welch two samples t-test reveal that male students ($M=1.73$, $SD=1.12$) had a slightly higher self-efficacy to learn online than female students ($M=1.56$, $SD=1.05$), $t(714) = -1.95$, $p = 0.05$. However, Cohen's d indicates a negligible effect, $d = -0.15$, 95% CI $[-0.3, 0.002]$. Further one-way ANOVA analyses do not reveal any differences in self-efficacy by degree, major, and age. Students' self-efficacy varies based on the level of their studies, $F(4, 672) = 3.115$, $p = 0.015$. The post-hoc Tukey test indicates that students at the postgraduate level were more self-efficacious in learning online than sophomores ($p = 0.05$). The remaining comparisons by level do not indicate any significant differences.

Teachers' Experiences. Most of the surveyed teachers ($n=50$) reported using a combination of the synchronous and asynchronous modes of

teaching online. When asked about the features of VC they used, teachers reported relying on private chat ($n=66$), uploading a presentation ($n=65$), using breakout rooms ($n=46$), and sharing an external video ($n=46$). In terms of LMS, they used the most VC ($n=68$), Lessons ($n=67$), files ($n=54$), and discussions ($n=39$).

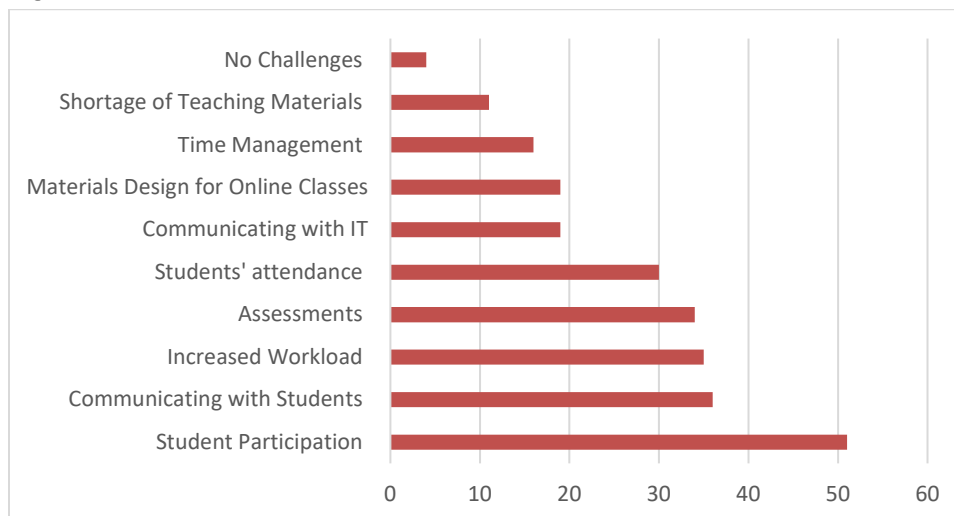
Teachers reported on the technology-related challenges such as poor internet connection ($n=44$), difficulties using VC ($n=40$), difficulties with LMS ($n=27$), and difficulties accessing VC ($n=17$; Figure 3). In terms of teaching-related challenges, teachers reported difficulties in motivating students to participate during online classes ($n=51$), communicating with students ($n=36$), increased workload and stress ($n=35$), and only four teachers reported having no challenges with online teaching (Figure 4). When asked if they would consider teaching online in the future, fifty out of 73 (68.5%) surveyed teachers responded affirmatively.

Figure 3. Technology-related Challenges in Online Teaching ($n=73$).



Source: authors' work.

Figure 4. Teaching-related Challenges in Online Teaching ($n=73$).



Source: authors' work.

The results of self-efficacy to teach online among 73 faculty members indicate that teachers felt self-efficacious ($M=2.83$, $SD=0.68$). The group comparison analyses do not indicate any statistically significant differences in terms of teachers' gender, age, academic rank, or role at the university or department. Teachers were also asked to report preferences for teaching online or in person, along with their likelihood of teaching online in the future. The results of the Welch two samples t -test reveal that teachers who considered teaching online after the pandemic ($M=2.95$, $SD=0.7$) have higher self-efficacy to teach online than teachers who do not want to teach online in the future ($M=2.55$, $SD=0.55$), $t(54) = -2.67$, $p = 0.01$. Hence, Cohen's d indicates a medium effect size, $d = -0.61$, 95% CI $[-1.12, -0.1]$. Those teachers who did not plan on teaching online in the future ($M = 3.43$, $SD=0.95$) preferred teaching in person rather than the teachers who planned on teaching online after the pandemic ($M = 2.22$, $SD=1.17$), $t(52) = 4.73$, $p < 0.001$, Cohen's $d = 1.10$, 95% CI $[0.56, 1.63]$. In addition, male teachers ($M=2.82$, $SD=1.18$) preferred face-to-face instruction more than female teachers ($M=2.23$, $SD=1.26$), $t(62) = -1.99$, $p = 0.05$, Cohen's $d = -0.48$, 95% CI $[-0.98, 0.005]$.

What are students' and teachers' perceptions of online education?

The thematic analyses reveal corresponding themes across students' and teachers' perceptions. Three broad themes include online learning and teaching experiences, e-learning technology, and learning and teaching changes.

Students' Perceptions. Students reflected on their online learning experiences in terms of their favorite and least favorite aspects. All the interviewees ($n=10$) appreciated the flexibility that was offered by online study. Some highlighted the ability to re-watch a video recording, such as a Level 6 student: "The favorite part was ... we can watch seminars, watch lectures which part we did not understand (sic)." Students also emphasized that online experience allowed them to become more digitally literate.

There were many more least favorite parts of online learning, however. The number one issue was the lack of contact with teachers. For example, a Level 4 student said: "The worst part

... is that you are going to have very limited interaction with the lecturer." Problems follow this issue in classes that require students to do computational tasks or use statistical software. For instance, a Level 6 student noted: "It is difficult to work on programs ourselves ... not in the university with the help of teachers."

All ten interviewees expressed their gratitude toward technology: they considered the video-conferencing tool BBB "user-friendly", and students mentioned that they used all the available functions within BBB. In addition, while all the students felt comfortable using a desktop version of BBB, many of them complained about the mobile application. For example, a Level 4 student stated: "But on the phone, it is really difficult because you can see the lecturer speaking and that the screen share, but you cannot really use chat and video simultaneously because you have to go [to] another page ..."

Regarding the Learning Board (LMS), students mentioned it was well-organized and easy to navigate. A Level 4 student said: "I would say this thing that I love most of all at [university] is the Learning Board. ... it's really easy to use. ... Everything is really neatly organized." A Level 7 student highlighted access to the digital library and quizzes. All the interviewed students agreed that accessing lecture and seminar materials, video recordings of classes, and coursework tasks was convenient.

Many of the interviewed students noticed no drastic changes in online teaching. For example, a Level 6 student reported, "... nothing has changed in terms of how the teachers teach and deliver their knowledge." However, a Level 4 student noted that his classmates were not attending online classes. A Level 5 student complained that some teachers became distracted by irrelevant conversations in public chats during the class.

Regarding changes in learning, several students noted that all the materials were accessed electronically, and there was a lack of interactive physical activities in online learning since students had to be in front of the screens. Another recurring theme was increased digital literacy.

However, at least four times, students reported becoming lazy and not learning much due to a

lack of control from teachers. A Level 6 student noted, "Receiving the knowledge that is changed because ... because there is a lack of engagement, lack of supervision to remove students from distractions that may appear." A couple of students mentioned that they learned how to multitask: Learn content and features of new technology simultaneously.

Teachers' Perceptions. All interviewed teachers across four departments reported having positive and negative experiences with online teaching. The positive online teaching experiences are grouped around teaching and technology-related topics. For example, among the teaching-related positive experiences were the convenience and flexibility online teaching offers (n=9), including saving time for commuting and preparing physical copies of class materials (n=4). For example, a teacher in the law department shared, "... you do not have to speak loud. Furthermore, you can ensure that... everyone has access to materials." Several teachers mentioned such benefits as learning how to use new platforms and applications (n=3) and using various features within these platforms.

Nevertheless, all teachers expressed some negative experiences with online teaching. One of the most problematic issues was students' unwillingness to use microphones and/or cameras during online classes. A lecturer from the global education department noted, "... Like first and second seminars, students were more active or ... more engaged, but after several sessions, student learns the way not ... participating in online sessions. So, students can easily say that my mic does not work or internet connection [is a problem]." Overall, classroom management was a challenge in online teaching, which was mentioned twenty times across three interviews.

Another set of negative experiences revolved around technology. For example, two teachers were unhappy with an unstable internet connection. In four instances, teachers were not happy with the features of LMS, which did not meet their expectations in terms of taking automatic attendance and the ability to divide students into groups.

The video-conferencing software BBB was one of the recurring topics across three focus group interviews. Many teachers reported having issues with the tool, stating that it was not user-

friendly (n=1), was slow in uploading documents and sharing attachments (n=2), and created difficulties while using the whiteboard function (n=1). Nevertheless, several teachers reported using various features of BBB while teaching, such as polls (n=4), public and private chat (n=3), share the screen (n=1), and breakout rooms (n=1). The poll function within BBB was used to engage students during online classes; as one of the teachers noted, "... after some time, I realized that I can communicate using the polls that are there, inside."

Regarding LMS, all teachers across departments used it as a repository to distribute materials and collect student work. A teacher in the marketing department shared that the discussion board "works better for me while it is in the class. However, again, it was challenging putting students in the groups ... to discuss things." A teacher in the finance department noted that the faculty at the university did not take full advantage of LMS.

All teachers agreed that online instruction led to changes in students' learning. For example, one of the marketing teachers claimed that students received more individualized instruction, "I think students get an opportunity for 1 to 1 teaching." Three teachers admitted that students developed new skills, such as doing calculations in Excel, using Google Docs for written communication, and learning how to use video recording and editing software.

Interestingly, while eleven out of thirteen interviewed teachers taught online for the first time, two of them reported not noticing any changes between face-to-face and online teaching since "the content is the same." However, three teachers reported adapting materials and assessments to online teaching and complained about an increased workload.

Teachers were dissatisfied with a whiteboard in VC for online classes, especially in classes requiring calculations. Nevertheless, teachers tried to use different techniques to make their online teaching engaging by using Q&A sessions, which were unsuccessful due to students' reluctance and unwillingness to use microphones (n=2). Nevertheless, two other teachers resorted to using polls in BBB. As a result of these successes and challenges, online seminars, at least for two of the interviewed teachers, turned out to be structured. One of the interviewed teachers felt self-conscious since

online classes were recorded and stored on the university's servers.

DISCUSSION

This study has examined the experiences and perceptions of university students and teachers of distance education in Uzbekistan. The results reveal that participants relied on technology provided through the university such as videoconferencing and LMS. This finding suggests that participants developed the technological knowledge (TK) of TPACK to study and teach online (Koehler & Mishra, 2009).

Students' and teachers' TK was challenged by hardware and software availability. For instance, when reporting on the technology-related challenges of distance education, both groups unanimously agreed that poor internet connection was the most prominent issue. This can be explained by the developing infrastructure of Internet coverage across Uzbekistan, especially in remote areas. The bandwidth of and access to more expensive Internet packages could be potential barriers preventing students and teachers from using high-speed Internet to access their schoolwork, which resonates with experiences in distance education across the globe (Azlan et al., 2020; Cullinan et al., 2021; Laufer et al., 2021; Luck Yardi et al., 2022; Shahrill et al., 2021).

Students and teachers agreed that using the features within VC was challenging. Participating teachers reported on experiencing difficulties with LMS. A possible explanation for these challenges could be a lack of digital literacy among students and faculty. While the university organized training sessions for students and professional development for faculty on using ICT, the two-hour sessions were not enough to develop their digital literacy skills, bringing us back to TPACK. Koehler and Mishra (2009) posit that teachers should have a high degree of TK to recognize what technologies can hinder or facilitate students' learning. Based on the survey and focus group results, this study concludes that the use of technology was based on trial and error. That is, teachers experienced difficulties with the technology and could not guide their students, which might have affected students' learning.

In the surveys, students were asked about learning-related challenges and teachers about their teaching-related challenges with online

education. The top three learning-related challenges for students were distractions such as family and phones, time management, and motivation, which is aligned with Yates et al. (2020), who found that family responsibilities are the main hurdle in distance learning, which is consistent with Woodcock et al. (2015); Mishra et al. (2020) and Shahril et al. (2021). This finding suggests that the sample of Uzbek students struggled with self-regulated learning and might have benefitted from instruction on managing their time and environment in online classes (Carter et al., 2020). In terms of teachers, they struggled with student participation in online classes, communicating with students, and increased workload, which might relate to the design of online teaching materials. This result echoes the findings of van der Spoel and colleagues (2021), who identified a lack of interaction and increased workload during online teaching. From the perspective of TPACK, teachers' challenges with materials design might stem from a lack of experience and knowledge of adapting their teaching materials and methods to online teaching. All teachers have been teaching in face-to-face settings for many years, and they have developed pedagogical knowledge (PK) and content knowledge (CK) to teach their courses. Online teaching in the fall of 2020 was their first experience with distance education. Thus, their PK and CK to teach online fell behind, given their struggles with TK.

The students' and teachers' self-efficacy results suggest that teachers were more self-efficacious to teach online ($M = 2.83$) than students to study online ($M = 1.66$). A similar finding was reported by Horvitz and colleagues (2015) based on a survey of 91 faculty members whose self-efficacy scores were not lower than 3.69. In this study, there were no differences in self-efficacy by gender among teachers. The findings also suggest that teachers who would consider teaching online in the future preferred distance education more than those who would not.

Group comparisons of self-efficacy among students reveal that male students were more self-efficacious in studying online than female students. Also, master's degree students were more self-efficacious than sophomore students. Research on self-efficacy to study online is inconclusive (Alqurashi, 2016) and posits that it depends on many external factors (Peechapol et al., 2018).

The focus group interviews elaborated on some of the survey findings. For example, while students and teachers used and appreciated VC and LMS for their synchronous sessions, they had some negative experiences with these tools; students did not like the experience with mobile versions. Teachers reported that the tools were not user-friendly. Nevertheless, students and teachers agreed that online classes created flexibility in terms of access and availability of recorded classes. Focus group discussions with teachers revealed that most of them used LMS as a repository for distributing teaching materials and class videos.

CONCLUSION

The conclusion of this study is that students and teachers had different experiences with distance education. The study results through TPACK (Koehler & Mishra, 2009; Mishra, 2020) suggest that teachers developed TK, as evidenced by their self-efficacy scores and focus group interviews. However, they still struggled with using certain technology features and continued using LMS as a repository. Another troublesome finding is that both students and teachers did not report any changes to online teaching because "content did not change", which raises questions about the pedagogical aspect of distance education. Available evidence suggests that faculty could not intertwine technology, pedagogy, and content to deliver successful online instruction.

These results should be interpreted cautiously due to limitations such as small sample size, focus on one university, and use of instruments developed for decision-making purposes. However, this study contributes to research on online education by describing the experiences of both teachers and students, implementing a ten-week professional development course for teachers, and evidence base for developing distance education curricula in Uzbekistan. As future research, examining digital education across universities in Uzbekistan is recommended. In terms of practice, students and teachers need rigorous instruction on digital literacy. In terms of policy, developing university programs on educational technology and distance education is recommended.

To move online education in Uzbekistan forward, more rigorous research and well-developed

professional learning workshops for students and teachers are called for.

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Appendix A

Fall 2020 Student Digital Learning Survey

Dear Student,

You are invited to take a Digital Learning Survey about your learning experiences online during the fall 2020 semester. Your participation in this survey is entirely voluntary. You may end your participation at any time. There are no risks of participating in this survey. Your responses to the survey will inform [university] administration, faculty, Student Support Services, and Learning Resources Center on how to deliver high quality online instruction. If you choose to participate, please be honest and respond to the questions to the best of your ability. It will take you between 5 and 10 minutes to respond to the items on this survey.

Any data, which may be used for research or publication purposes will not include any personally identifying information. Any identifiable data will be removed, and results will be reported in aggregate. All information obtained in this survey is strictly confidential.

You will be entered into a prize draw for your participation in this survey.

If you have any questions, please do not hesitate to contact [Contact Person].

By starting the survey, you confirm that you are at least 18 years of age, and consent to participate in this study.

Survey Questions

Section I: Experiences with Technology

1. Based on your experience with online learning in fall 2020, what technology did you use to access and submit your school work? Please select all that apply.
 - a. Computer (PC, laptop)
 - b. Mobile phone
 - c. Tablet (iPad, etc.)
 - d. Other (please specify)
2. Based on your experience with online learning in fall 2020, what features of [university] Video Conference do you typically use in your classes? Please select all that apply.
 - a. Public chat
 - b. Breakout rooms
 - c. Share screen
 - d. Start a poll
 - e. Shared notes
 - f. Other (please specify)
3. Based on your experience with online learning in fall 2020, what features of [university] Learning Board do you typically use in your classes? Please select all that apply.
 - a. Lessons (where you can access your class materials)
 - b. Discussions
 - c. Quizzes
 - d. Assignments
 - e. Video conference
 - f. Module description
 - g. Announcements
 - h. Other (please specify)
4. Based on your experience with online learning in fall 2020, what are some of the technological tools that your teachers asked you to use during your classes? Please select all that apply.
 - a. [university] Learning Board
 - b. [university] Video Conference
 - c. Zoom
 - d. Google Sheets
 - e. Google Forms
 - f. Kahoot
 - g. Other (please specify)
5. Based on your experience with online learning in fall 2020, what were some technology-related challenges of accessing your school work? Please select all that apply.
 - a. Difficulties with accessing Video Conference
 - b. Difficulties with using various tools within Video Conference
 - c. Difficulty accessing materials within [university] Learning Board (downloading files, participating in discussions, taking quizzes, submitting assignments)
 - d. Limited access to software
 - e. Poor internet connection
 - f. No internet access
 - g. Poor electricity supply
 - h. Other (please specify)

6. Based on your experience with online learning in fall 2020, what are some of the learning-related challenges? Please select all that apply.
- Your access to technology (i.e., poor internet access, electricity supply, PC issues, etc.)
 - Communicating with lecturers
 - Difficulties navigating Video Conference
 - Difficulty navigating [university] Learning Board
 - Low level of directions and support provided by lecturers
 - Keeping yourself motivated and interested in doing online work
 - Difficulty with submitting assignments and exams
 - Receiving timely feedback and marks
 - Increased levels of workload and stress due to taking modules from home
 - Difficulty with time management and organization to do online work on time
 - Distractions (family, pets, cell phone, internet, etc.)
 - There were no challenges
 - Other (please specify)
7. Based on your previous experiences with online learning, please share any other comments, suggestions, or observations in a space provided

Section II: Self-efficacy to Learn Online

8. For each of the sentences below, choose the best option to express your thoughts. Select your responses on a scale from Strongly Agree to Strongly Disagree
- I am confident I can learn without the physical presence of an instructor to assist me.
 - I am certain I can understand even the most difficult material presented in an online class.
 - Even with distractions, I am confident I can learn material presented online.
 - I prefer face-to-face classes to online ones. (This item is not measuring self-efficacy. It was excluded from the analyses).

Section III: Demographic information

9. Degree
- Undergraduate
 - Post-graduate
 - Certification/non-degree
10. Major (Undergraduate)
- Business Information Systems (BIS)
 - Finance
 - Economics with Finance
 - Business Management
 - Commercial Law
11. Major (Post-graduate)
- MSc in Applied Economics
 - Post Graduate Certificate in Teaching and Learning
 - MA in International Business Management
 - LLM in International Commercial Law
 - MSc in Business Intelligence and Analytics
 - MA in Human Resource Management and Talent Development
12. Level
- Level 3
 - Level 4
 - Level 5
 - Level 6
 - Level 7
13. Age
- Under 18
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-64
 - 65+
14. Gender
- Female
 - Male

Thank you for your participation. We really appreciate your contribution. If you have questions or suggestions, do not hesitate to contact [Contact Person].

Appendix B

Fall 2020 Faculty Digital Teaching Survey

Dear Faculty Member,

You are invited to take a Fall 2020 Faculty Digital Teaching Survey about your current experiences teaching online. Your participation in this survey is entirely voluntary. You may end your participation at any time. There are no risks of participating in this survey. Your responses to the survey will inform the [university] administration, Center for Professional and Lifelong Education (CPLE), and Learning Resources Center (LRC) on how to provide the best support for our academic staff. If you choose to participate, please be honest and respond to the questions to the best of your ability. It will take you around 10 minutes to respond to the items on this survey.

Any data, which may be used for research or publication purposes will not include any personally identifying information. Any identifiable data will be removed, and results will be reported in aggregate. All information obtained in this survey is strictly confidential. If you have any questions, please do not hesitate to contact [Contact People].

By starting the survey, you confirm that you are at least 18 years of age, and consent to participate in this study.

Survey Questions

Section I: Experiences with Technology

1. What module(s) do you teach in the fall 2020 semester?
 - a. Synchronous (using only Video Conference)
 - b. Asynchronous (using only [university] Learning Board)
 - c. Combination of Video Conference and [university] Learning Board
 - d. None of the above
 - e. Other (please specify)
2. What features of [university] Video Conference do you typically use? Please select all that apply.
 - a. Public chat
 - b. Breakout rooms
 - c. Upload a presentation
 - d. Share external video
 - e. Start a poll
 - f. Shared notes
 - g. Save user names
 - h. Other (please specify)
3. What features of [university] Learning Board do you typically use? Please select all that apply.
 - a. Lessons
 - b. Pages
 - c. Files
 - d. Discussions
 - e. Quizzes
 - f. Assignments
 - g. Video Conference
 - h. Group by Module
 - i. Module Chronicles
 - j. Module Description
 - k. Announcements
 - l. List of Exercise Completeness
 - m. Video Content
 - n. Course Work
 - o. Online Media
 - p. Assessments
 - q. Other (please specify)
4. What are some of the technological tools that you typically use to prepare for and teach your classes?
 - a. [university] Learning Board
 - b. [university] Video Conference
 - c. H5P
 - d. Zoom
 - e. Google Sheets
 - f. Google Forms
 - g. Kahoot
 - h. Other (Please specify)
5. Based on your experience in fall 2020, what were some technology-related challenges of teaching online? Please select all that apply.
 - a. Difficulties with accessing Video Conference
 - b. Difficulties with using various tools within Video Conference
 - c. Difficulty accessing materials within [university] Learning Board (uploading files, creating lessons, discussions, quizzes, etc.)
 - d. Limited access to software

- e. Poor/slow internet connection
 - f. No internet access
 - g. Poor electricity supply
 - h. Other (please specify)
7. Based on your experience with online teaching in fall 2020, what are some of the teaching-related challenges? Please select all that apply.
- a. Communicating with students
 - b. Communicating with IT and other help services (i.e., LRC, etc.)
 - c. Motivating students to attend online sessions
 - d. Motivating students to participate during online sessions
 - e. Converting activities and materials into online format
 - f. Assessing students' progress and learning
 - g. Increased levels of workload and stress
 - h. Time management and organization to do work on time
 - i. Shortage of online and printed materials for your classes
 - j. There were no challenges
 - k. Other (please specify)
8. If you were given a chance to teach online after the pandemic, would you consider doing so?
- a. Yes
 - b. No

Section II: Self-efficacy to Learn Online

9. For each of the sentences below, choose the best option to express your thoughts. Select your responses on a scale from Strongly Agree to Strongly Disagree
- a. I can confidently use [university] Video Conference to deliver my online classes.
 - b. I can use the tools of [university] Learning Board to support my online teaching.
 - c. I can provide technical support to my students when they encounter technical difficulties accessing our synchronous sessions.
 - d. I can explain to my students how to use tools in the Video Conference during our synchronous sessions.

- e. I am certain I can facilitate active participation of my students during the Video Conference sessions
- f. I am certain my students can successfully master content presented online.
- g. I prefer face-to-face teaching to online classes. (This item was not measuring self-efficacy. It was excluded from the analyses)

Section III: Demographic information What is your role?

- h. Head of Department
 - i. Course Leader
 - j. Module Leader
 - k. Other (please specify)
10. What is your academic rank?
- a. Associate Lecturer
 - b. Lecturer
 - c. Senior Lecturer
 - d. Principal Lecturer
 - e. Associate Professor
 - f. Professor
 - g. Other (please specify)
11. Department
- a. Management and Marketing
 - b. Economics
 - c. Finance
 - d. Law
 - e. Computing
 - f. Global Education
 - g. Other (please specify)
12. Age
- a. Under 18
 - b. 18-24
 - c. 25-34
 - d. 35-44
 - e. 45-54
 - f. 55-64
 - g. 65+
13. Gender
- a. Female
 - b. Male

Thank you for your participation. We really appreciate your contribution. If you have questions or suggestions, do not hesitate to contact [Contact People].

Appendix C

Focus Group Interview: Students

Focus Group Interview Script

The moderator of the focus group will explain the rules for the focus group interview using the following script:

"Good morning/afternoon/evening everyone. Thank you for making time to participate in this focus group interview. I am [Introduction], and I will conduct a focus group today. Let me remind you about the purpose of this focus group and some rules that we will be following during our conversations.

"The main purpose of this focus group interview is to learn about your thoughts regarding online learning. I will ask you questions about what you like or dislike about online learning. I will start a conversation by asking you questions. You are asked to respond truthfully and to the best of your knowledge. Your responses will be video-recorded. The video-recordings will not be made public and if your thoughts are to be shared, all identifying information about you will be kept confidential. Does everyone feel comfortable being video/audio-recorded?

"While responding to questions, please be respectful to other participants in the interview. Try not to interrupt your peers or dominate the conversation. If, at any point, you feel uncomfortable answering a question, you can choose not to respond. Also, keep in mind that the information you are sharing with us today is private, and do not to share it with other people outside of the focus group. If you think that some of your thoughts regarding some questions should be kept private, you can always choose not to respond. You can choose to end your participation in the focus group at any time, just let me know.

"Do you have any questions for me? Please think of at least one question to ask.... [Interviewer will answer any questions and address all concerns].

"If everyone feels comfortable, let's start our conversation. After I ask you a question, you can take some time to think about your responses."

Focus Group Interview Questions for Students

1. Tell me about your online learning experiences for the last three – four weeks.
 - a. What's your favorite part of it?
 - b. What's your least favorite part of it?
2. Tell me about your experiences using [university] Video-conferencing software.
 - a. How do you use it?
 - b. What do you like about it?
 - c. What don't you like about it?
3. Tell me about your experiences using [university] Learning Board:
 - a. How do you use it?
 - b. What do you like about it?
 - c. What don't you like about it?
4. What kind of resources/support would you like to have to help you feel comfortable using:
 - a. Videoconferencing?
 - b. [university] Learning Board?
5. How much teaching has changed in online mode?
6. How much your learning has changed?
7. How much online and face-to-face classes are similar or different?
8. What suggestions do you have to make your experiences learning online more successful?
9. Would you be interested in learning online even after the pandemic is over? Explain your answer.
10. Any other thoughts? Ideas? Suggestions? Concerns?

Appendix D
Focus Group Interview: Faculty
Focus Group Interview Script

The moderator of the focus group will explain the rules for the focus group interview using the following script:

"Good morning/afternoon/evening everyone. Thank you for making time to participate in this focus group interview. I am [Introduction], and I will conduct a focus group today. Let me remind you about the purpose of this focus group and some rules that we will be following during our conversations.

"The main purpose of this focus group interview is to learn about your thoughts regarding online teaching. I will ask you questions about what you like or dislike about online teaching. I will start a conversation by asking you questions. You are asked to respond truthfully and to the best of your knowledge. Your responses will be video-recorded. The video-recordings will not be made public and if your thoughts are to be shared, all identifying information about you will be kept confidential. Does everyone feel comfortable being video/audio-recorded?

"While responding to questions, please be respectful to other participants in the interview. Try not to interrupt your peers or dominate the conversation. If, at any point, you feel uncomfortable answering a question, you can choose not to respond. Also, keep in mind that the information you are sharing with us today is private, and do not to share it with other people outside of the focus group. If you think that some of your thoughts regarding some questions should be kept private, you can always choose not to respond. You can choose to end your participation in the focus group at any time, just let me know.

"Do you have any questions for me? Please think of at least one question to ask.... [Interviewer will answer any questions and address all concerns].

"If everyone feels comfortable, let's start our conversation. After I ask you a question, you can take some time to think about your responses."

Focus Group Interview Questions for Academic Staff

1. Tell me about your online teaching experiences during this semester.
 - a. What's your favorite part of it?
 - b. What's your least favorite part of it?
2. Tell me about your experiences using [university] Videoconferencing software:
 - a. How do you use it?
 - b. What are your successes?
 - c. What are some challenges?
 - d. How did you overcome these challenges?
 - e. What would you change/add etc.?
3. Tell me about your experiences using [university] Learning Board:
 - a. How do you use it?
 - b. What are your successes?
 - c. What are some challenges?
 - d. How did you overcome these challenges?
 - e. What would you change/add etc.?
4. What kind of resources/support would you like to have to help you feel comfortable using:
 - a. Videoconferencing?
 - b. [university] Learning Board?
5. How has your students' learning changed, if at all, during this semester?
 - a. Positive changes
 - b. Negative changes
6. How has your teaching changed, if at all, in the online format? Any observations?
 - a. Positive changes
 - b. Negative changes
7. On a scale of 1 – uncomfortable to 10 – extremely comfortable, how comfortable do you feel teaching online?
8. Would you be interested in teaching online even after the pandemic is over? Explain your answer.
9. Any other thoughts? Ideas? Suggestions? Concerns?