Virtual Learning Environments and a Needs Assessment of K–12 Teachers

Nalline Baliram
Kirsten Koetje
Emily Huff
Seattle Pacific University

Abstract

During the COVID-19 emergency pivot to virtual learning environments, the researchers sought to understand mentors' and teacher candidates' experiences in K–12 schools so that they could offer improved training and support. We surveyed 60 mentor teachers' and 92 teacher candidates' perceptions of preparedness for a virtual learning environment (VLE), confidence in creating an effective VLE, obstacles involved in a VLE, and strategies for building community in an online environment. The survey was administered in November 2020. Both teacher candidates and mentor teachers were fully immersed in the virtual learning environment. In the fall, participants felt they were much more confident and equipped to handle the VLE technology than when they had been abruptly forced to transition in the spring quarter of the prior school year. However, despite the various strategies used to build community, the participants noted student engagement as the biggest challenge in a VLE.

Keywords: online learning, virtual learning environment, student engagement, technology

Virtual Learning Environments and a Needs Assessment of K-12 Teachers

Educators, policy makers, parents, students, and administrators around the world pivoted to distance learning settings in the wake of the COVID-19 global pandemic. Many school systems chose a virtual learning environment (VLE) despite their lack of familiarity with using online platforms, lack of online curriculum, and unestablished routines for virtual teaching and learning. With a majority of schools shutting down in-person education starting in the spring of 2020, many states and local educational agencies began to plan for VLEs—a course of study in a web-based platform—for the opening of the school year in fall 2020. The VLEs that emerged from the global pandemic were of an emergency nature in the spring, and thus cannot be seen as identical to other traditional VLEs or blended learning environments (Aguliera & Nightingale-Lee, 2020; Trust & Whalen, 2020; Whittle et al., 2020). Even with more planning and preparation for VLEs for the reopening of schools in the fall of 2020, emergency characteristics remained. For instance, with an emergency VLE, there are added variables in the mix such as the presence of trauma (both with students and educators), inadequate internet connections, lack of appropriate technology, fewer trained stakeholders, childcare issues, economic constraints, and other destabilizing factors. Despite added training and preparation, many educators and families would not have chosen a VLE environment had there not been a pandemic. In this paper, we discuss the nature of the emergency VLE pivot during the COVID-19 global pandemic shortly after the fall 2020 re-opening of schools and its impact on teacher candidates and their mentor teachers.

A successful VLE in education depends upon how well teachers and their students have been trained to effectively utilize and engage the resources on hand and their motivation to do so. The shift from traditional, on-campus classes to online classes has been associated with many concerning developments, including a rise in student mental health concerns (Murata et al., 2021), lack of student achievement and engagement (Dorn et al., 2020), and an overwhelmed teacher force (Trust & Whalen, 2020).

As three teacher educators at a liberal arts university, we

knew teacher candidates needed support pivoting during this emergency transition to online teaching. We built modules in our programs that supported teacher candidates in prioritizing general learning principles, available school technologies, and familiarity with the International Society for Technology in Education (ISTE) standards. The online teaching modules were also offered as a professional development course for practicing teachers. Teachers need to develop general technological competencies so that they can be flexible, adaptive, and creative problem solvers for learning purposes, and not users of technology for technology's sake (Henriksen et al., 2019; Trust & Whalen, 2020).

The researchers surveyed teacher candidates and their mentor teachers in November of 2020 with the intent to gather information on perceptions of their preparedness, confidence with technology, obstacles, and strategies for building community in a VLE (see Appendix: VLE and Needs Assessment). During this emergency pivot, we wanted to understand mentors' and teacher candidates' experiences in K-12 schools so that we could provide more tailored training and support. Four major research questions guided our inquiry:

- How supported do teacher candidates and mentor teachers feel with online teaching?
- How confident do teacher candidates and mentors feel about teaching online?
- What are some struggles mentors and teacher candidates are experiencing with respect to VLEs?
- What are some ways mentors and teacher candidates are building community online?

Literature Review

Virtual Learning Environment (VLE)

Prior to the pandemic, distance learning was designated as a norm for many colleges and universities and less common for K-12 students. About 21% of public K-12 schools offered at least one online course before COVID-19 (National Center Educational Statistics [NCES], 2021). By mid-pandemic, February 2021, 82% of K-12 schools offered remote instruction (NCES, 2021). In 2004, 65% of universities offering graduate face-to-face courses

also offered graduate courses online (Allen & Seaman, 2005). Kim and Bonk (2006) predicted the trend of online teaching and learning in higher education. Based on data collected in early 2004, 87% of their respondents reported that their institutions offered online courses, and 70% of them had taught online courses. At the time of the survey, 27% of the participants predicted a dramatic rise in online learning and teaching. In fact, as of fall 2016, 31.6% were taking at least one course remotely (Seaman et al., 2019); more recently, in the 2019-20 school year, that number increased to 51.8% (Smaller, 2021). Although this trend toward online instruction may have been true over the last few years, studies had also found persistent inconsistency and ineffectiveness in implementation (Bernard et al., 2014). With the extent of online learning in a VLE significantly increased in 2020 due to the onset of COVID-19, one may raise the question of how well prepared the instructors were when compelled to transition from a face-to-face environment to a VLE.

Over the past decades, limited research exists that measures university students' and their instructors' perceptions about online learning and teaching. Studies such as Holzweiss et al. (2014) found that online graduate students learned best when they had opportunities to think critically in assignments and had access to various instructional technologies. Furthermore, they wanted to be able to interact with their peers and instructors. Fedynich et al. (2015) support such findings in their own study. They found that interaction between students and with the instructor produced overall satisfaction with the online students. Additionally, a vast majority of the students in their sample (93.17%) agreed or strongly agreed that "students have to be self-motivated to be successful in online programs" (p. 5).

In a recent study, researchers explored the impact of the university VLEs during the pandemic (Martin et al., 2021). The researchers examined the students' perception of the pedagogical model adopted in the VLE during the second semester of 2019-20 school year when schools transitioned rapidly to online learning. During this early transition period, students reported dissatisfaction with their teachers regarding their knowledge of and competence with technological resources (Martin et al., 2021).

Teacher Mindset

Technology know-how is a necessary but insufficient skill for effectively teaching in a VLE (Dorner & Kumar, 2017; Martin et al., 2021). Teacher confidence, creativity, culturally sustaining practices, and open mindset are other crucial factors, due to the rapidly changing nature of technology and the variety of systems used within schools. Henriksen et al. (2019) proposed a pedagogical approach called a creatively focused technology fluent (CFTF) mindset. They advocated for building teachers' self-efficacy with digital technologies, rather than a narrow tool-centered approach. Henriksen et al. (2019) argued that a CFTF mindset helps teachers build their own technological self-efficacy. This confidence transfers to new and unfamiliar technologies, as well as to accustomed tools.

The two fundamental parts of the proposed CFTF mindset are creativity and technology. In this framework, the ultimate goal is to promote the educator's *mindset*. Traits of the creative side of CFTF mindset include intellectual risk-taking, flexibility, and openness to the new. *Technology fluency* refers to the integration of content, pedagogy, and technology. Since the CFTF framework was published prior to the pandemic, it did not take the emergency global transition to VLEs into account. Arguably, there is more technological expertise and tool-centric know-how demanded of teachers during the emergency VLE scenario than in any prior situation. The Martin et al. (2021) study showed students were dissatisfied with their instructors' technological abilities during the early months of the pandemic. Although much of the online curriculum and learning management systems in K-12 schools are determined by overarching systems, teachers still retain much of the quotidian implementation of their VLEs (Henriksen et al., 2019).

Attention has been focused on how to provide culturally responsive-sustaining practices during the emergency VLE scenario (New York University [NYU] Metro Center, 2020). Educators need to be responsive to students' lived experiences, both at the individual and community level (NYU Metro Center, 2020). In culturally sustaining VLEs, educators are encouraged to have flexibility, compassion, and creativity. This type of

education integrates arts, culture, and creativity into students' lessons, which maps well onto the CFTF mindset. Examples of providing a culturally sustaining VLE experience include offering digital mindfulness activities, translation of online lessons and family communications, and providing resources and access to culturally sustaining texts (books, stories, media) either digitally or at local neighborhood sites. Cooking at home can infuse science lessons; family photos can launch historical inquiry. In VLEs, creative and compassionate teachers can brainstorm ways of integrating the technology with the students' communities and home lives. Educators need to consider students' cultural and identity influences as well as family preparedness to learn in a VLE (NYU Metro Center, 2020). Minero (2020) suggested that schools and teachers proactively reach out to families and onboard them to technological systems. Murata et al. (2021) suggested that teachers can minimize loneliness and mental anxieties exacerbated by the pandemic by establishing everyday routines for students, practicing mindfulness activities, and creating a safe space for students to talk about their thoughts. Stoltfus (2020) encouraged teachers to build remote communities that foster belonging and connectedness, such as using routines to inquire about students' concerns.

Engagement and Community Building

In a world of constant distraction, young people have access to streaming video, social media, and Google at their fingertips almost all the time. Therefore, educators have a tough job to keep their students engaged. Furthermore, educators faced even greater challenges in keeping students engaged as the world shifted to VLEs. Districts scrambled to ensure that all students have equipment, internet access, and technology to participate in online classes. Without the same level of supervision and coaching, self-regulation with technology tools became a considerable challenge for students. Many districts did not require students to turn on cameras for privacy concerns, so teachers had very little to go on to know if students were even in the room and participating. While districts pieced together new schedules and online protocols, some teachers struggled with reorganizing their

face-to-face classes into an online format. When teachers do not state clear expectations around online instruction, students become less motivated or find it difficult to engage in learning (Dennen, 2005). Difficulties with student engagement in asynchronous online discussions have been identified as pervasive concerns (Hara et al., 2000, Hew et al., 2010). Indifference and boredom (Xie et al., 2011), low participation (Thomas, 2002), and superficial discussions (Hew et al., 2010) have been commonly linked with low student engagement.

It is important to note that engagement is not the same thing as participation. Abdulla (2021) wrote, "students can participate in learning without truly being engaged. Typically, this occurs when students experience more passive participation as opposed to active participation." Instructors need to put practices in place to validate student learning, celebrate accomplishments, and build community. Meyers (2014) found that successful teachers in VLEs increase engagement by giving students active learning options, stating clear learning objectives, providing context for learning, offering tips for self-regulation in online learning, and evaluating online tools regularly. Moreover, in order for academics and engagement to fall into place in both virtual and face-to-face classrooms, students need to know that teachers care about them, and they need to be able to express themselves socially and emotionally (McMahon, 2020).

Methodology

The purpose of this study was to examine the level of support teacher candidates and mentor teachers received at the start of the 2020-21 school year as they transitioned to a virtual learning environment. The researchers sought to identify any obstacles teacher candidates and mentor teachers encountered as they attempted to build an online community. Additionally, the investigators wanted to better understand what tools teachers were using and how the faculty and university supervisors in the teacher education program might modify their program offerings to further support them.

Participants

The investigators collected data from 92 out of 98 teacher candidates who completed a survey as an optional assignment in one of their fall courses. It is noteworthy to disclose that the investigators were the instructors of the courses, and one was the director of field placement. Responses were voluntary and anonymous. Students' participation or non-participation did not have any impact on their course grades. Additionally, 60 out of 140 mentor teachers participated in the survey. They were offered a chance to win a $25 gift card if they were willing to include their name in the drawing. Each mentor teacher who self-reported that they completed the survey had a 1 in 30 chance of winning a gift card.

Of the 92 teacher candidates surveyed, 31 taught at an elementary level, 20 at a middle school level and 41 at a high school level. Furthermore, 21 mentor teachers taught elementary, 14 taught middle, and 25 taught high school. For the purpose of this study, elementary level was identified as kindergarten through 5th grade, middle school was 6th through 8th grade and high school was 9th through 12th grade. Table 1 illustrates the distribution of the grade levels taught by the mentor teachers and teacher candidates.

Table 1
Grade levels and endorsements

Discipline	Mentor	Teacher Candidate
Kindergarten	3	3
1st Grade		3
2nd Grade		2
3rd Grade	1	
4th Grade	3	1
5th Frade	1	
Multiple Grade Levels	5	7
Special Education	8	14
English Language	6	5
Social Studies	7	10
Foreign Language	2	1
Mathematics	6	9
Science	3	10
Physical Education	5	13
Visual Arts	3	7
Performing Arts	2	3
Multiple Disciplines	4	6

Data Collection and Analysis

The survey titled *Virtual Learning Environment (VLE) and Needs Assessment for K-12 Teaching* (see Appendix) was crafted by the investigators of this study and reviewed by various faculty for reliability purposes. The intent for the survey was to gather information generally regarding the VLE landscape in Washington schools, but also specifically in schools who are hosting the teacher candidates from the teacher education program affiliated with the investigators of this study. It consisted of 21 multiple choice questions and 5 free responses. The survey was distributed to the participants using Microsoft Forms. Data was collected anonymously. Teacher candidates were asked to complete the survey at the end of Week 7 of a 10-week quarter in their course on professional issues. This week was chosen for two reasons; by the end of the 7th week, the candidates would have completed two months of student teaching in VLE, and they would have been exposed to various technological teaching strategies from both the course and their teaching experience. The mentor teachers were invited to complete the survey after a mentor training which occurred at the end of the fall quarter. To ensure every mentor teacher was able to participate, the survey was sent via the mentor newsletter and an email distribution list.

Data collected were both quantitative and qualitative. The researchers generated descriptive statistics for the 21 quantitative items. For the remaining 5 free responses, the researchers analyzed and coded for themes.

Results

In research question one, participants reported how well they were supported with online teaching. With respect to administrative support (district or building) a large majority of respondents 105 of 152 (69%) reported feeling "some" or "wonderful" support from their administration (Figure 1). An even larger majority, 121 of 152 (almost 80%) reported support from their specific team (Figure 2).

The investigators sought to examine how the training and support both the teacher candidates and mentor teachers received from the teacher education program were utilized. Table 2 below

Figure 1

Item 11: If you are teaching online, how would you rate your training and support to start the year online from your administration (district or building)?

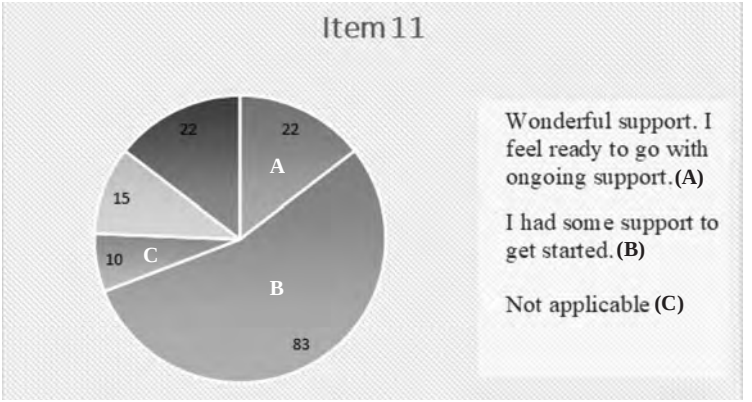
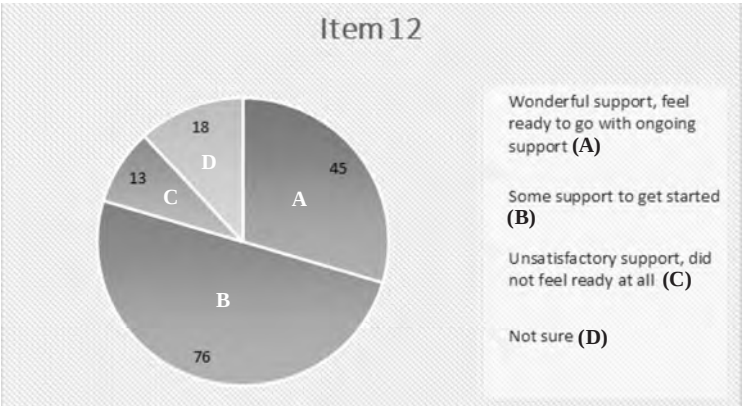


Figure 2

Item 12: If you are teaching online, how would you rate your training and support with your own grade level teams (e.g., 3rd grade), department (e.g,. math department) or professional learning community?



provides a description. Comparatively, Table 3 offers a description on how the participants made use of their training and support offered by the school district.

Table 2

Item 13: Of the online training and support that you received from the university, which best describes the focus of the trainings?

Responses	Frequency (Mentors)	Frequency (Student Teachers)
A blend of both tool-centric and creativity/technology based	5	38
Creativity and technology based—General mindsets and principles for using technology, but not focusing on specific tool training.	12	42
Tool-centric—This is how you can use certain tools, such as Zoom or Canvas.	1	6
Not applicable	42	6

Table 3

Item 14: Of the online training and support that you received from your school system (e.g., school or district), which best describes the focus of the trainings?

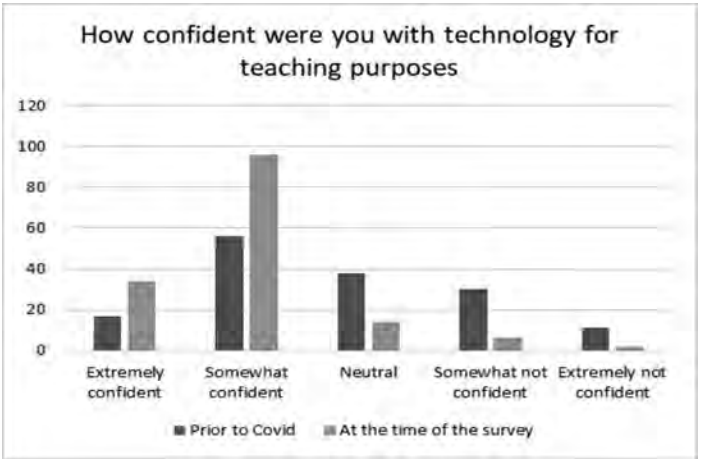
Responses	Frequency (Mentors)	Frequency (Student Teachers)
A blend of both tool-centric and creativity/technology based	32	38
Creativity and technology based—General mindsets and principles for using technology, but not focusing on specific tool training.	3	8
Tool-centric—This is how you can use certain tools, such as Zoom or Canvas.	21	28
Not applicable	4	18

In research question two, the teacher candidates and mentor teachers compared their level of confidence about teaching in a VLE prior to COVID 19 closures (February and earlier) and during the transition at the time of the survey (October/November 2020). Figure 3 shows this comparison. Prior to COVID closures, 73 out of 152 participants either felt extremely or somewhat confident and at the time of the survey, the number increased

to 130. Furthermore, compared to the 41 participants who felt somewhat or extremely not confident, the number decreased to only 8 by October/November 2020. Figure 4 further breaks down the data by comparing the mentor teachers and teacher candidates. A theme that arose from the data suggested that those who felt extremely unconfident prior to the closures started feeling somewhat confident a few months later at the time the survey was administered. Interestingly, many of these participants also rated the level of support they received as unsatisfactory.

Figure 3

Items 16 & 17: How confident were you with technology for teaching purposes prior to COVID 19 closures (February 2020 and earlier) and right now (October/November 2020)?



Research question three examined mentor teachers and teacher candidates' biggest obstacles with respect to online instruction. Earlier in the survey, teachers were asked to describe their VLE scenarios, such as ability to use breakout rooms during synchronous class (Item 7), school expectations of students' use of cameras during synchronous class (Item 8), and teacher location (Item 9). From the data, a large majority of teachers reported being able to use breakout rooms (136 of 145 or 94%); schools encouraged or allowed student camera use, but did not require it (133 of 144 or 92%); and teachers could choose their own location for teaching either on-site or elsewhere (120 of 148 or 81%). Ten of 144 (7%) respondents reported student camera use during

synchronous class as required. Six of 148 (4%) teachers were required to teach on-site.

Figure 4

Items 16 & 17: How confident were you with technology for teaching purposes prior to COVID 19 closures (February 2020 and earlier) and right now (October/November 2020)?

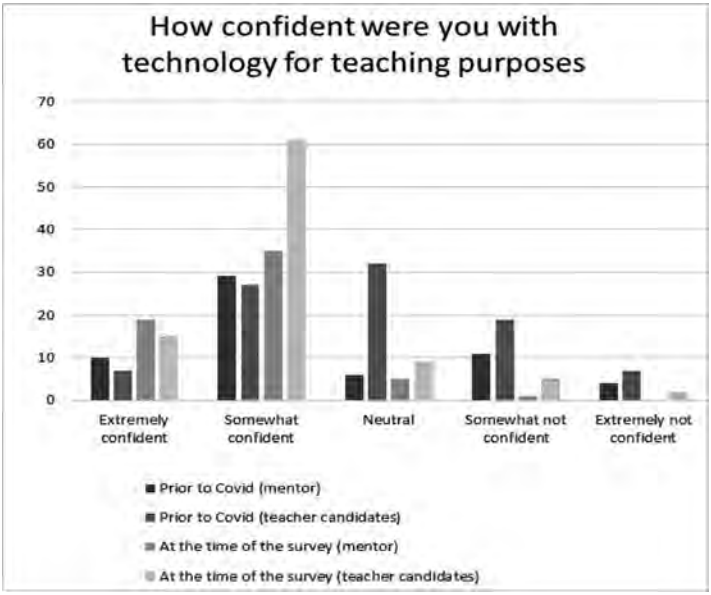
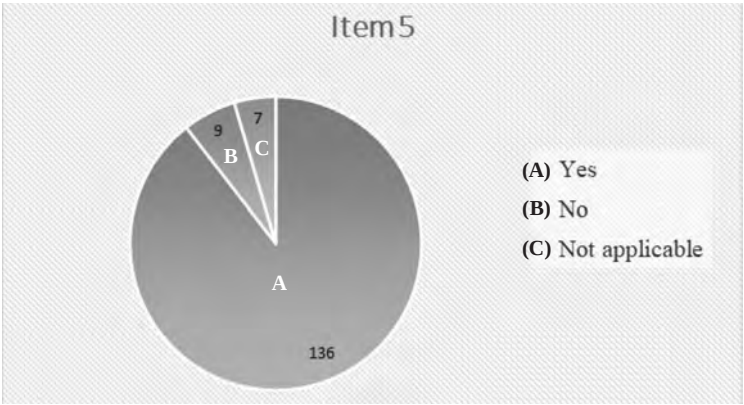


Figure 5

Item 7: Is your district allowing breakout rooms in synchronous classes (e.g. Zoom, Google Meet, Microsoft Teams)?



In survey item 21 regarding VLE obstacles, choices were provided for participants to select in addition to providing their own responses. Table 4 for item 21 shows that the most common obstacle came from student engagement. Student connectivity problems, not having a suitable curriculum for online learning, and student hardware/software issues were also identified as obstacles. Below are some free responses to "other" obstacles the participants noted.

- "I wouldn't call it engagement, as all our students show up every day and participate, but more that it's hard for students focus [sic] and feel connected to school over a computer." (Teacher candidate)
- "Not enough teacher and student instructional time." (Teacher candidate)
- "Getting students/parents to choose to log in and attend." (Teacher candidate)
- "Too many distractions at home (pets, siblings, parents working)" (Mentor)

Table 4

Item 21: What do you see as the main obstacle(s) to providing quality VLE instruction?

Obstacle	Total	Percent
Student engagement	116	76%
Students' connectivity (Internet access)	75	49%
Curriculum suited to online format	55	36%
Students' hardware and/or software	40	26%
Teaching connectivity (Internet access)	30	20%
Student confidence in technology	30	20%
Teacher confidence in technology	28	18%
Teacher hardware and/or software	21	14%
Other (optional fill-in)	17	11%

The investigators compared the video policies of teachers' building sites from item #8 with respondents' answers to their main obstacles, item #21, to see if video policy appeared to have an association with the obstacle of student engagement. The results can be seen in Table 5. Teachers who reported video cameras as required during synchronous class (n = 10) were the

least likely to report student engagement as a main obstacle. Sixty percent of those who reported a *required* camera policy, named engagement as a main obstacle compared with 82.5% of teachers who reported video usage as encouraged, but not required.

Table 5

Video Policy and Listing Student Engagement as a Main Obstacle

Video Policy*	Obstacle	Not Obstacle	Total
Encouraged, but not required	85(82.5%)	18 (17.5%)	103
Student preference	20 (66.7%)	10 (33.3%)	30
Video camera required	6 (60%)	4 (40%)	10
Video camera not allowed	1 (100%)	0 (0)%	1
Total	112 (77.7%)	32 (24%)	144

**Note:* Respondents who marked "not applicable" for item #8 on video policy are not included.

The survey included items regarding the technological tools teachers were using to deliver their VLEs. Item 22 was open-ended, "Provide some examples of teaching tools you are using for instruction". In total, the respondents mentioned 58 different tools. The most commonly named tools with ten or more mentions were Kahoot (60), Google (27), Khan Academy (23), Padlet (21), FlipGrid (17), Pear Deck (14), YouTube (13), Seesaw (11), NearPod (11), and Quizlet (10).

Item 23 on the survey asked participants, "What online teaching strategy/tool are you struggling with and need more support on?" The most common answer involved support for a specific technological tool or strategy (65 of 152). Of those 65 responses, 21 different technology tools were indicated, with facilitation of breakout rooms in Microsoft Teams and Zoom leading the list. Strategies for student engagement was the second-most cited struggle, garnering 14% of the requests for further support (or 16 mentions).

Survey item #25 asked, "Is there anything else you would like to share in regard to pivoting to online learning and teaching?" We saw several themes emerge around teacher exhaustion and student mental health concerns along with some positive benefits found in online teaching and learning. Some of these themes are represented in the comments from teacher candidates and mentors below:

- "It is exhausting mentally. Planning and instruction take way longer than in person." *(High School Teacher Candidate)*
- "It's first-year teaching all over again." *(High School Mentor Teacher)*
- "The lack of feedback is the biggest challenge. Hard to be sure that students are all present. Zoom and Teams are not specifically designed with classroom monitoring and engagement in mind—tools such as these need improvements to better emulate the live class experience with real-time feedback between students and teachers." *(Middle School Teacher Candidate)*
- "We are experiencing a lot of student depression, low motivation, and scheduling skills." *(High School Teacher Candidate)*
- "There is a positive to being virtual. Having EL teachers not pulling groups all day is a great opportunity for EL teachers to push-in and collaborate with classroom teachers. The research tells us that pulling isolated groups is not effective for language learners, so we are trying to move toward a more inclusive model. This virtual learning is starting to move that thinking in the right direction." *(Elementary Mentor Teacher)*
- "It is a valuable experience for students to learn technology." *(Elementary Mentor Teacher)*

The fourth research question asked how mentor teachers and teacher candidates were building community online. One mentor teacher summarized it well by giving this equation for community building: "authenticity + intentionality + time." Teachers shared many excellent strategies such as implementing social emotional learning in friendship groups and morning meetings, using engaging warm-up questions to build community and trust, leading activities to get kids moving, and prioritizing projects like "Student of the Week", monthly birthday celebrations and shared read-alouds. A few quotes from teachers are below:

- "I give students a 10-minute screen break. 5 minutes is a mandatory screen break and 5 minutes can be used to chat with friends and build those connections. I also use breakout rooms often and as much as possible."

- "Small group activities, games, watching funny videos, and incorporating students' individual interests into learning materials/ topics of books read."
- "We have spent time engaging in small groups and having intentional 1 on 1 engagement with students by using multiple forms of communication to reach out—text, email, video, etc."

Discussion and Limitations

In Trust and Whalen's (2020) survey of over 300 teachers in the emergency VLE situation early on (April and May 2020), a majority (61%) cited feeling overwhelmed with all the resources. A smaller majority (52%) cited lack of knowledge about VLE strategies as another major challenge. In this current study, the researchers surveyed the participants later, in November 2020, and a different and significant concern emerged: student engagement. The data showed that educators cited student engagement as the main concern (75% of responses) versus only 18% citing teacher confidence with technology. Local educational agencies and teachers themselves ostensibly met many of the technology and training challenges over the summer and early fall. They felt much more equipped to handle the VLE technology in the fall than the abrupt pivot in the spring. One may infer that schools spent the summer months choosing tools, buying necessary software and hardware, and training teachers on the chosen systems, but not necessarily prioritizing student engagement strategies.

The researchers found noticeable differences in the training provided by local educational agencies and that of the teacher education program. Tables 2 & 3 show this difference; for example, the participants reported that the local education agencies focused on tool-centric strategies (32%) more than the teacher education program (5%). Furthermore, the participants described that the teacher education program focused their training on creativity and technology mindset; whereas, the local educational agencies focused on technology tools. The participants requested over 21 different technology tools for support. As a teacher education program, offering to support the teacher candidates and mentors for all these various tools was impractical. Instead, it was prudent to

foster a CFTF (creatively focused technology fluent) mindset and prepare candidates and mentors for proficiency in the most commonly used tools such as Zoom, Microsoft Teams, and Canvas.

The data in this VLE survey suggested that the main concern for educators in November 2020 was student engagement. The state where this survey was conducted had a high level of restrictions. Most schools were closed to in-person learning; sports and extracurricular events were restricted in fall and winter seasons; and masks were required. Families and educators were given little to no opportunities for in-person social interactions. Despite the training and technology preparation the teachers received in the summer, with such isolating measures in place along with heightened mental health concerns, the 2020-2021 school year would constitute an "emergency" VLE. The open-ended comments from the survey validates this notion. Teachers reported that parents were unable to consistently monitor their children, and many teachers themselves were responsible for their own childcare while they taught online.

In looking at our study, there were certainly some limitations around our data collection and research. First of all, this was primarily a needs assessment for a particular program. Our ultimate goal was to see how our specific interns and mentors were faring so that we could adjust programming if need be. The main intent was not one of generalizability to all American teachers. Secondly, the qualitative data was coded for common themes by one coder; therefore, no interrater agreement was established. The researchers on this team also served as the instructors of these teacher candidates, and this crossover of roles certainly could have given us a different perspective about the data. Furthermore, the survey was administered in the fall, which was a very stressful and busy time for the teacher candidates given the nature of the pandemic and the stresses of their teacher preparation program.

Conclusion

In conclusion, preparation programs should focus on training candidates for technology fluency and encourage a mindset of creativity and flexibility rather than prioritizing certain tools. Since school systems have their own adopted tools, universities

can encourage attendance at district trainings on their specific tools and integrate these trainings into program requirements. Lack of technology competence can hinder the satisfaction of student and teacher experience (Dorner & Kumar, 2017). For instance, preparation programs can integrate practical applications of tools into program assignments, such as solving problems of practice within their learning communities. In order to promote student engagement, a topic of discussion could be strategies for increasing student camera usage during synchronous classes.

As preparation programs continue to grow their capacity in training future educators for hybrid or online teaching, they must prioritize strategies to encourage student engagement. As schools transition back to in-person learning, teachers can take lessons learned from this emergency virtual learning experience and focus on best practices to re-engage students in culturally sustaining ways.

References

Abdulla, R. (2021, January 4). *5 tips for increasing student engagement online*. OLC. https://onlinelearningconsortium.org/5-tips-for-increasing-student-engagement-online/

Aguliera, E., & Nightengale-Lee, B. (2020). Emergency remote teaching across urban and rural contexts: perspectives on educational equity, *Information and Learning Sciences, 121*(5/6), 471–478. https://doi.org/10.1108/ILS-04-2020-0100

Allen, I. E., & Seaman, J. (2005). *Growing by degrees: Online education in the United States*. The Sloan Consortium. https://files.eric.ed.gov/fulltext/ED530062.pdf

Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: From the general to the applied. *Journal of Computing in Higher Education, 26*(1), 87–122. https://doi.org/10.1007/s12528-013-9077-3

Dennen, V. P. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion, *Distance Education, 26*(1), 127–148. https://doi.org/10.1080/01587910500081376

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020, December 20) COVID-19 and learning loss—disparities grow and students need help. *McKinsey & Company*. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help#

Dorner, H., & Kumar, S. (2017). Attributes of pre-service and inservice teacher satisfaction with online collaborative mentoring. *Online Learning, 21*(4), 283–301. https://doi.org/10.24059/olj.v21i4.1020

Hara, N., Bonk, C. J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course, *Instructional Science, 28*, 115–152. https://doi.org/10.1023/A:1003764722829

Henriksen, D., Mehta, R., & Rosenberg, J. M. (2019). Supporting a creatively focused technology fluent mindset among educators: Survey results from a five-year inquiry into teachers' confidence in using technology. *Journal of Technology and Teacher Education, 27*(1), 63–95. https://www.learntechlib.org/primary/p/184724/

Hew, K. F., Cheung, W. S., & Ng, C. S. L. (2010). Student contribution in asynchronous online discussion: A review of the research and empirical exploration. *Instructional Science, 38*(6), 571–606. https://doi.org/10.1007/s11251-008-9087-0

Holzweiss, P. C., Joyner, S. A., Fuller, M. B., Henderson, S., & Young, R. (2014). Online graduate students' perceptions of best learning experiences. *Distance Education, 35*(3), 311–323. https://doi.org/10.1080/01587919.2015.955262

NYU Metro Center (2020). *Guidance on culturally responsive-sustaining remote education.* https://crehub.org/s/NYU-Metro-Center-Guidance-on-Culturally-Responsive-Sustaining-Remote-Teaching-and-Learning-2020-1-1.pdf

Martín, C. T., Acal, C., El Homrani, M., & Mingorance Estrada, Á. C. (2021). Impact on the Virtual Learning Environment Due to COVID-19. *Sustainability, 13*(2), 582. https://doi.org/10.3390/su13020582

McMahon, W. (2020, January 16). How a simple student feedback tool helps personalize learning and safeguard student well-being. *EdSurge*. https://www.edsurge.com/news/2020-01-10-how-a-simple-student-feedback-tool-helps-personalize-learning-and-safeguard-student-well-being

Meyers, K. (2014). Student engagement online: *What works and why*. Hoboken, New Jersey: John Wiley & Sons.

Minero, E. (2020, August 21). 8 strategies to improve participation in your virtual classroom. *Edutopia*. https://www.edutopia.org/article/8-strategies-improve-participation-your-virtual-classroom

Murata S, Rezeppa T, Thoma B, Marengo, L., Krancevich, K., Chiyka, E., Hayes, B., Goodfriend, E., Deal, M., Zhong, Y., Brummit, B., Coury, T., Riston, S., Brent, D. A., & Melhem, N. M. (2021). The psychiatric sequelae of the COVID-19 pandemic in adolescents, adults, and health care workers. *Depress Anxiety*. 38(2), 233–246. https://doi.org/10.1002/da.23120

National Center for Education Statistics (2021). *Back to school statistics*. https://nces.ed.gov/fastfacts/display asp?id=372#K12-distancelearning

Seaman, J. E., Allen, I. E., & Seaman, J. (2019). Grade increase: *Tracking distance education in the United States*. Babson Survey Research Group. https://files.eric.ed.gov/fulltext/ED580852.pdf

Smalley, S. (2021, October 13). Half of all college students take online courses. *Inside Higher Ed*. https://www.insidehighered.com/news/2021/10/13/new-us-data-show-jump-college-students-learning-online

Stoltzfus, K. (2020, April 7). 5 essential trauma-informed priorities for remote learning. ASCD.https://inservice.ascd.org/5-essential-trauma-informed-priorities-for-remote learning

Thomas, M. (2002). Student participation in online discussion: The implications of learning activities and discourse development on assessment evaluations 2002 conference (Brisbane, Queensland).

Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education, 28*(2), 189–199. https://www.learntechlib.org/primary/p/215995/

Whittle, C., Tiwari, S., Yan, S., & Williams, J. (2020). Emergency remote teaching environment: A conceptual framework for responsive online teaching in crises, Information and Learning Sciences, 121(5/6), 311–319. https://doi.org/10.1108/ILS-04-2020-0099

Xie, K., Durrington, V., & Yen, L. L. (2011). Relationship between students' motivation and their participation in asynchronous online discussions. *Journal of Online Learning and Teaching, 7*(1), 17–29. https://jolt.merlot.org/vol7no1/xie_0311.htm

Nalline Baliram, Ph.D., is an Associate Professor in the School of Education at Seattle Pacific University. She brings 14 years of teaching high school mathematics to her role as a face to face, online, and hybrid instructor. She has been preparing pre-service teachers for the math and science K-12 classrooms since 2013.

Kirsten Koetje, Ph.D., is the Assistant Director of Graduate Teacher Education at Seattle Pacific University. She brings 10 years of teaching high school English and French to her teacher educator role, including Peace Corps Mozambique and online teaching. She has been preparing teachers at SPU since 2013, including the oversight of the university's online teacher education programs. In 2017, Kirsten won the AILACTE Graduate Scholar Award for her work with video analysis in teacher preparation.

Emily Huff, M.A., is a member of the School of Education faculty at Seattle Pacific University; she also works as the Director of Field Placements at SPU. Her teaching experience ranges from first grade through high school in Seattle and Tukwila, and she has supported teacher candidates at Vanderbilt University, University of Tennessee, and SPU. She also serves as the director of an educational non-profit advocating for children in India and Kenya.

Appendix

Virtual Learning Environment (VLE) and Needs Assessment for K-12 Teaching

1. You are completing this form as a
   - Mentor teacher
   - Student teacher intern
2. Please choose the type of school you are currently interning/teaching at
   - Elementary
   - Middle
   - High
3. Please select the size of your school district or school system (if private school).
   - Private school system with 1,000 or more students
   - Private school system with <1,000 students
   - Small public school district (<2,500 students)
   - Medium public school district (Between 2,501-10,000 students)
   - Large public school district (>10,001 students)
4. What discipline(s) are you teaching?
5. What is the learning management system your school/district is currently using (e.g. Canvas, Blackboard, Google Classroom)?
6. Please choose the format you are using for teaching the content
   - Synchronous
   - Asynchronous
   - Both synchronous & asynchronous
7. Is your district allowing breakout rooms in synchronous classes (e.g. Zoom, Google Meet, Microsoft Teams)?
   - Yes
   - No
   - Not applicable
8. If you are teaching online, which best describes your district policy on students turning on their video cameras in synchronous sessions:
   - Encouraged, but not required

- Student preference
- Video camera is required
- Video camera is not allowed
- Not applicable

9. If you are teaching online, which best describes your district policy on teacher location during work hours?
   - Teachers are required to teach from their classroom/school unless given district/admin permission the whole week.
   - Teachers are required to teach from their classroom/school unless given district/admin permission for part of the week.
   - Teachers are able to teach from their classroom or remotely. They can choose.
   - Teachers are teaching from remote locations (e.g. home).
   - Not applicable
10. If you are teaching online, which best describes your district policy on recording synchronous lessons with students (e.g. Zoom)?
    - Recordings are mandatory
    - Recordings are not allowed
    - Recordings are dependent upon situation/context
    - Not applicable
11. If you are teaching online, how would you rate your training and support to start the year online from your administration (district or building)?
    - Wonderful support. I feel ready to go with ongoing support.
    - I had some support to get started.
    - Not sure
    - Unsatisfactory support. I did not feel ready at all.
    - Not applicable
12. If you are teaching online, how would you rate your training and support with your own grade level teams (e.g. 3rd grade), department (e.g. math department) or professional learning community?
    - Wonderful support. I feel ready to go with ongoing support.
    - I had some support to get started.
    - Not sure
    - Unsatisfactory support. I did not feel ready at all.

13. Of the online training and support that you received from SPU, which best describes the focus of the trainings?
    - Tool-centric – This is how you can use certain tools, such as Zoom or Canvas.
    - Creativity and technology based – General mindsets and principles for using technology, but not focusing on specific tool training.
    - A blend of both tool-centric and creativity/technology based
    - Not applicable
14. Of the online training and support that you received from your school system (e.g. school or district), which best describes the focus of the trainings?
    - Tool-centric – This is how you can use certain tools, such as Zoom or Canvas.
    - Creativity and technology based – General mindsets and principles for using technology, but not focusing on specific tool training.
    - A blend of both tool-centric and creativity/technology based
    - Not applicable
15. Teachers of record: If you are teaching in a new format this year (e.g. online or hybrid), how would you describe your work hours compared to previous years (not including COVID spring 2020)?
    - Working about as much as usual
    - Working 1-5 more hours a week more than usual
    - Working 6-10 more hours a week more than usual
    - Working 11-15 hours a week more than usual
    - Working >15 hours a week more than usual
    - Not applicable
16. How confident were you with technology for teaching purposes prior to COVID 19 closures (February 2020 and earlier)?
    - Extremely confident
    - Somewhat confident
    - Neutral
    - Somewhat not confident
    - Extremely not confident

17. How confident are you with technology for teaching purposes right now – October/November 2020?
    - Extremely confident
    - Somewhat confident
    - Neutral
    - Somewhat not confident
    - Extremely not confident
18. How often does your remote education class integrate arts, culture, and/or creativity into students' lessons?
    - Very often (multiple times a week)
    - Often (every week or two)
    - Sometimes (Once or twice a month)
    - Rarely (Once or twice a term)
    - Never
    - Not applicable (not teaching online)
19. For online school days (if you are in a hybrid scenario), how often do students get built in breaks?
    - At least every 30-45 minutes
    - At least every hour
    - Every couple of hours
    - Once or twice a day
    - Lunch only
    - Not applicable
20. Does your school incorporate digital mindfulness or meditation activities as part of the curriculum? (Check as many as apply.)
    - Yes, I incorporate digital mindfulness or meditation activities in my own content class (e.g. teaching math, English, social studies).
    - Yes, other teachers incorporate digital mindfulness or meditation activities in their content class (e.g. Math, English, social studies).
    - Yes, the schools incorporate digital mindfulness or meditation activities (such as advisory).
    - Digital mindfulness or meditation activities are provided as an optional activity, such as an online club or counselor small group offering.

- No, there are not any digital mindfulness or meditation activities that I know about.

21. What do you see as the main obstacle(s) to providing quality VLE instruction? (Check the ones you believe are the biggest obstacles.)
    - Teacher hardware and/or software
    - Teacher connectivity (Internet access)
    - Students' hardware and/or software
    - Students' connectivity (Internet access)
    - Curriculum suited to online format
    - Student engagement
    - Teacher confidence in technology
    - Student confidence in technology
    - Other
22. Provide some examples of teaching tools you are using for instruction (e.g., Kahoot, PhET, Khan Academy, Pear Deck).
23. What online teaching strategy/tool are you struggling with and need more support on?
24. What other areas of online teaching would you like more support on?
25. Is there anything else you would like to share in regards to pivoting to online learning and teaching?
26. How have you built remote learning communities and fostered belonging and connectedness in a VLE?