Staying Virtually-Together: Enhancing Teacher Preparation Through Technology

Lindsey Pike
University of Central Florida

Melissa Carli
University of Central Florida

The COVID-19 pandemic necessitated a global shift to remote and virtual learning in PK-12 and postsecondary settings. This article details the use of technology within one teacher preparation program at a large public university to form a "virtually-together" modality of program delivery for course content and clinical internship experiences essential to the development and certification of new teachers beginning their classroom careers. Digital and virtual technology, cohort model principles, and social media were leveraged to meet the needs of preservice teachers and other stakeholders during the pandemic. Continued benefits of these technology-driven transformations and implications for teacher preparation are discussed.

Impacts from the COVID-19 Pandemic

In March of 2020, the outbreak of the COVID-19 pandemic forced a national shift to online and remote schooling for PK-12 schools and postsecondary institutions (Center for Disease Control, 2020; Education Week, 2020). Schools of teacher education were also required to close and charged with the task of rethinking the delivery of not only coursework, but of service learning and clinical internship experiences critical to the development and initial certification of preservice teachers (Hartshorne et al., 2020). Teacher educators across the field worked to innovate and adapt to meet the demands of pandemic-related mandates and the needs of their preservice students (Hartshorne et al., 2020). As closures and mandates lifted and schools at every level reopened, transformative technology use initiated by COVID-19 shutdowns proved to be beneficial beyond the pandemic (Chiu et al, 2021; Singh et al., 2021; Trust & Whalen, 2020). Within a personnel preparation and research project at one large university (the Teacher Quality Partnerships Project), video conferencing, social media, and other technologies were leveraged during the pandemic to create a "virtually-together" electronic learning community among educators within multiple schools. This new way of work strengthened and informed further enhancement to research, evaluation, relationships, and collaboration within the project and has been extended and sustained post-pandemic.

The Teacher Quality Partnerships Project

The *Teacher Quality Partnerships: Downtown Experience (TQP*) project aims to recruit, prepare, and sustain highly effective teachers through specific foci in mathematics, disciplinary literacy, and evidence-based instructional practices to improve the learning outcomes for students with diverse learning needs in high-need schools. Using a randomized control trial (RCT) design, the project investigates the differences between teacher candidates (TC)

interning in high-need schools participating in a typical, 'business as usual' (BAU) preparation program and TCs receiving the TQP Enhanced Preparation Model (EPM). Faculty and staff from the project university partner with teachers and administrators in the local school district and national and state partners to co-develop the EPM. University professors-in-residence (PIR) in the project are essential in the implementation of the EPM, acting as liaisons between the university and the schools, serving as clinical coordinators for all TCs in the project, and delivering curriculum, resources, and coaching to TCs in the EPM.

The Enhanced Preparation Model (EPM)

The TQP project EPM consists of weekly professional learning sessions with curriculum resources and enhanced school-site coaching, both delivered by the PIRs. The content for the EPM weekly professional learning sessions originates from a scope and sequence developed by university faculty and district personnel and which focuses on evidence-based practices for mathematics instruction and student social and emotional needs. In the original EPM design, PIRs scheduled and delivered in-person weekly professional learning to TCs in the EPM condition at their school site. PIRs support TCs in their learning of evidence-based practices through onsite coaching and observations. In typical BAU internship settings, clinical coordinators conduct two to three non-participant observations throughout the semester. The clinical coordinator does not interact in the classroom during the observation and focuses on specific classroom practices during each observation. The TCs in the EPM receive these required non-participant observations, as well as coaching and participant observations from their PIR. In participant observations, the PIR is responsive to TC needs and acts as a co-learner with students and/or responds to the students or the TC during each observation and coaching session (Puig & Froelich, 2011).

Pivoting in COVID

Revising the EPM: Leveraging Technology for Professional Learning

Like all other educational organizations, the TQP project and university preparation program had to respond to the pandemic by developing and implementing new structures and models for professional learning and internship experiences. As participation in the school setting shifted to virtual for the teachers and teacher candidates, as well, the project also used technology to provide professional learning, coaching, and ongoing communication to TCs. The project capitalized on the emerging video-conferencing platform (e.g., Zoom) to provide the weekly professional learning to TCs in the EPM. A web course containing the professional learning presentations, related content, and additional internship resources was also created by project staff to accommodate the shift to online learning. Members of the project staff who were experts in mathematics instruction and social-emotional learning took on the role of leading the professional learning sessions. The PIR role then shifted to facilitating and supporting conversations within their school-site group during these virtually-together sessions. Virtual breakout rooms provided TCs virtual sessions to connect with their PIR and other TCs at their school site *and* extend their professional community by connecting with the TCs at other schools. Even in shifting to a new virtually-together model, the TC perceptions of the professional learning sessions remained highly favorable. Results from perception surveys show 100% of the TCs found value in the professional learning sessions, with 80% finding extreme value in the learning.

Prior to implementing the virtually-together format, PIRs stated in qualitative interviews that modifications to the curriculum for TCs in the EPM had been made to meet individual questions from TCs at the school site. This posed some risks to fidelity. Moving to virtual, synchronous sessions for EPM professional learning during the pandemic allowed the EPM to be delivered to TCs within that condition at the same time with the same presenters, eliminating some variance in EPM delivery and enhancing the fidelity of the project research design.

Virtually-Together: A New Professional Learning Format

Because of the benefits of virtual, synchronous professional learning, the TQP project maintained this format for EPM delivery even after pandemic restrictions laxed. Adoption and further development of the "virtually-together" format enabled the TQP project to reach a broader audience at various locations while continuing to provide meaningful participant interaction. During TQP virtually-together sessions, participants gather in a common room at their school site (e.g., media center, cafeteria, etc.) and connect to the larger community through the video conferencing platform displayed on a large screen for all to see and hear. This format allows the TCs, supervising teachers, and other participants to collaborate in the same location while having access to presenters and other stakeholders in a separate location. Similarly, the presenter can connect synchronously with participants in multiple locations and still build in interactions and engagement. When using the virtually-together format, pre-recorded videos or a live keynote can be played for all viewers to see within the video conferencing platform and prompt follow up discussions and activities.

The virtually-together approach was originally implemented during the pandemic for professional learning delivery to EPM TCs, but now serves as the primary modality for EPM professional learning and other project activities and events. For example, the project hosted a summer institute in 2021 to provide a forum for supervising teachers and TCs to learn and discuss internship expectations, building relationships, and lesson planning. Prior to the event, project staff used Zoom to record lead supervising teachers sharing their own experiences in conversation with one another and then formatted the video into shorter, targeted segments. On the day of the summer institute, administrators, instructional coaches, TCs and supervising teachers met at their school sites and the virtually-together modality was utilized to play the recorded segments as conversation prompts. After each segment, the lead presenter and site-based PIRs led discussions of key points, reflection, and strategies for the given topic. Moving from the original face-to-face delivery to the virtually-together eliminated the need for travel to a common site for summer institute participants. This saved the TQP project approximately $1,000 per day in travel funds for each day of the institute and the virtually-together format will be used for the summer institute in 2022.

Table 1 shows a comparison among Virtual, In-Person, and Virtually-Together formats for delivering professional learning. The table lists considerations for planning and implementing professional learning and how they vary across delivery modalities. Preparation program leaders can consider the various elements of each delivery format and determine the best modality to use for a particular professional learning session, series, or course.

Table 1
Professional Learning Modalities

	Format	Virtual Format	In-Person Format	Virtually-Together Format
Considerations	Platform/ Space Considerations	Video-conferencing software (e.g., Zoom or Teams)	Large space with tables and projector screen	Combination of video-conferencing software and space for participants to gather with access to projector screen
	Materials/ Handouts	Clickable links and shareable documents	Physical handouts or access to online documents through QR codes, tiny URLs, etc.	Physical handouts or access to online documents through QR codes, tiny URLs, etc.
	Facilitation	Facilitator or host presents material and leads conversations	Facilitator or host presents material and leads conversations	Host presents material while facilitators lead conversation at each site
	Participant Interaction	Breakout groups for participants to collaborate. Shareable documents used to make thinking visible.	Participants seated in table groups to collaborate. Physical handouts, chart paper, or online documents used to make thinking visible.	Participants seated in table groups to collaborate. Physical handouts, chart paper, or online documents to make 2003thinking visible. Online reporting (e.g., Padlet) to share ideas across sites.
	Travel	Participants join from work or home	Participants drive to a central location	Participants join from their work site in a central meeting space

Staying "Virtually-Together" Through Social Media

During the pandemic, social media also became an important resource for the TQP project. Scholars and researchers have investigated and shared how social media can be leveraged to support teacher education (Curran & Chatel, 2013; Munoz et al., 2014), and this was further highlighted during the closures and isolation of the pandemic. The TQP project Twitter, Instagram and

Facebook accounts became an integral lifeline to building and maintaining community, resource dissemination, and recruiting teacher candidates and community partners for the project when COVID-19 halted in-person courses and internships. Project social media accounts were used to celebrate the accomplishments of TC interns and supervising teachers and highlight initiatives and events within partner school sites and the community. In addition to the project Facebook page, the *OCPS Teacher Knights: TQP Cohort* Facebook page supported the project's induction and retention efforts by maintaining relationships and supporting TCs through their first years of teaching. Connecting via social media allowed for links between the local school district, individual school sites, the University, and broader community through tweets, retweets, follows, and tags. In this way, all project stakeholders took part in co-constructing and sharing the TQP story.

In addition to building and maintaining community, social media accounts became a primary support in disseminating project information and additional resources to TCs, community partners, and other stakeholders. During the pandemic, resources from weekly virtually-together professional learning sessions and other teacher preparation resources were posted across TQP social media accounts - a practice continued today. Information about important project and university preparation program events are also shared through Twitter, Instagram, and Facebook to support TC attendance and completion of activities for project research and the preparation program. The TQP website also serves as a core location for project information and resources. The website houses information about the development of the project, the EPM content and processes, and stakeholder collaboration. Recordings of professional learning webinars (like a guest speaker series on social emotional learning) and links to learning materials for all stakeholders (including a video series on teacher candidates as assets to classrooms and schools) can all be found on the project website.

Another important way social media enhanced the project is as a platform for visual storytelling and recruitment. Developing an online presence through project social media to stay connected during the pandemic evolved into resource sharing and visual storytelling and ultimately helped to spread news of the TQP project. This exposed a wider audience of both TCs and partner district school sites to the project, increased the TC intern recruitment pool, prompted more in-service teachers to consider clinical supervision certification, and interested more school sites in possible partnership with the project. As a result, despite the pandemic, two additional schools were added as TQP partner sites, TC intern recruitment numbers increased, and the impact and integration of the project throughout schools expanded and improved within urban settings of the partner school district.

Challenges and Program Transformations

Leveraging the virtually-together hybrid modality, social media, and other technologies provided many sustaining and enhancing practices to the TQP project. It is important for the authors to also relay the challenges and lessons-learned in implementation, during the pandemic and beyond, to better inform programs and personnel who may also wish to use similar methods to advance their own teacher preparation goals. In regards to the research design and methods within the project, social media and technology increased communication between TCs and other stakeholders, including between those in

BAU and EPM conditions. This poses an issue of treatment diffusion within the randomized control trial research design. School site meetings for TCs in the EPM were also visible to those in the BAU group if/when they passed by the location of the professional learning session. Project leaders are working on efforts to reinforce group separation - a consideration important for other preparation research using randomized control trial design.

The use of various technologies to meet needs and make revisions within the project also posed challenges related to technological literacy. All stakeholders had different levels of experience and comfort working with various platforms, social media, and other technologies. To ensure all could access and participate, TQP project team members provided explicit instructions on use of technology, ensured school tech personnel were available during virtually-together sessions, and selected a ST from the partner school sites with strong technology skills to provide support. Printed materials were made available, when possible, and 'test runs' of technology needed for virtual events were conducted. Internet security and software/platform compatibility also came up when working through technology use. For example, the TQP project utilizes Zoom for video conferences and virtual meetings and the project partner district uses Microsoft Teams. Additionally, certain websites and online resources, like YouTube and Facebook, are often blocked by school district internet firewalls to support student safety and focus on campus. To address these obstacles, the TQP project team and school district and school site personnel collaborated to ensure platforms and software could be used and integrated for project purposes.

Disengagement and fatigue from computer and technology use (i.e., "Zoom fatigue") were common challenges experienced during the pandemic. Professional learning and other digital and remote activities in the project required consistent and effective strategies to maintain engagement. During virtually-together sessions, PIRs facilitated their school-site group and liaised with the host and other groups connecting via video conferencing. As facilitators, the PIRs provided individual connections to their school-site attendees - something the host could not do as easily since they were remote. Building in frequent breaks during longer sessions, incorporating interactive components, and encouraging participants to keep cameras on when possible also supported participation and engagement. Google Slides, Jamboard, Padlet, and Kahoot were frequently used to support engagement and interaction and they easily integrate with the Zoom video conferencing platform. Video backgrounds and closed captioning, co-hosts to support chat features and troubleshooting, and break out rooms for group work were used regularly during live video sessions and became essential practices.

Implications for Teacher Preparation

The strategic use of technology within the TQP project both during and after the pandemic has important implications for teacher preparation. In particular, the revisions within the project illustrate how technology and social media can be used to develop and enhance the already effective cohort model approach (Greenlee & Karanxha, 2010; Ross et al., 2006) to teacher preparation. Cohort models build teamwork skills, collaborative problem solving, and relationships (Barnett et al., 2000; Browne-Ferrigno & Muth, 2003) to support and strengthen TC development. The challenges of the COVID-19 pandemic made the importance of TC community and collective learning within cohort models even clearer, during times of crisis and beyond.

Using the virtually-together hybrid modality within the TQP cohort model improves access to critical preparation resources, activities, and connections for all students and stakeholders. This is important as the portrait of college students today is ever-diversifying and changing. Many students work part or full-time, have children, are caregivers, and/or come from a variety of other backgrounds, circumstances, and income levels (NCES, 2021a and 2021b). The use of a virtually-together format expands hybrid instruction and supports more equitable access to important preparation programming and experiences for all types of students. Social media promotes community building, program recruitment, and resource sharing that is accessible to all. Leveraging social media, the virtually-together modality, and other technology could also provide opportunities for connecting outside of the college classroom or local school to other school sites, other TCs in other prep programs, and more. The hybrid modality increases flexibility and consistency in the delivery of program coursework, professional learning, observations, and coaching. Increased flexibility in delivering all key aspects of a preparation program could support development of school-based Para to Pro preparation opportunities, Masters level preparation programs for in-service teachers, and other delivery models to improve recruitment, preparation, and retention of new teachers.

Conclusion

The shift to virtual learning caused by the COVID-19 pandemic (CDC, 2020) resulted in transformative tech use with benefits that transcended the original context and further developed the structure and delivery of teacher prep (Darling-Hammond & Hyler, 2020; Hartshorne et al., 2020;). The combination of remote and cohort learning, video conferencing, and social media use to remain virtually-together proved valuable and essential to continuing prep through the pandemic, but also revealed new strategies to improve preparation, regardless of context. The authors encourage other stakeholders in teacher preparation to consider how they could use the revisions and insights from the TQP project to reflect on other pivots made out of necessity that may prove valuable post-pandemic. Sharing our experiences in teacher preparation and collaborating to advance the field are all part of the shared mission to create teacher preparation that is accessible, authentic, and promotes the best possible outcomes for future teachers and their future students.

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Lindsey Pike is a Graduate Research Associate for the Teacher Quality Partnerships project and a Doctoral Candidate at the University of Central Florida. Her research includes special education in teacher preparation.

Melissa Carli is project manager for the Teacher Quality Partnerships project at the University of Central Florida. Her focus is on instructional practices that help students think critically around mathematics.