A 2025 Vision for Building Access to K-12 Online and Blended Learning in Pre-service Teacher Education

CHARLES B. HODGES  
*Georgia Southern University, USA*  
chodges@georgiasouthern.edu

MICHAEL BARBOUR  
*Touro University California, USA*  
mkbarbour@gmail.com

RICHARD E. FERDIG  
*Kent State University, USA*  
rferdig@gmail.com

In this paper the authors present a vision that by 2025 all teacher education programs will prepare teacher candidates with the knowledge, skills, and experience necessary to be successful teaching in online and blended modalities. The authors present evidence that all teachers need to be proficient in online and blended teaching, and they provide six objectives for teacher education programs to achieve that goal for pre-service teachers. Threats to each goal are discussed, as well as strategies for implementation.

INTRODUCTION

The move for many K-12 schools to online and blended learning (OBL) was facilitated by the COVID-19 pandemic (Barbour et al., 2020). However, schools have chosen to move from *traditional* instruction to remote learning to accommodate virus outbreaks, weather events (Cray & Ome, 2021), and most currently, armed conflicts (Specia & Varenikova, 2022). It should be
clear that the ability to maintain continuity of instruction using online delivery is no longer a stopgap measure, but a reality of teaching.

There is also empirical evidence to support the fact that teachers need better preparation to work across such modalities (Crompton et al., 2021; Reich, 2021). Bartlet (2022) found that U.S. teachers facilitating various forms of hybrid learning during the pandemic were experiencing chaos and exhaustion and believed that they were providing less content and reduced interactions with their students. Trust and Whalen (2020) surveyed 325 teachers about their needs for emergency remote teaching in the early days of COVID-19. Their findings showed the need to provide pre-service teachers (PSTs) with “the opportunity to develop K-12 online and blended teaching competencies so that they are prepared to teach in different formats, settings, and situations” (p. 193).

Some teacher education programs (TEPs) are changing to incorporate more experiences for OBL, but the changes are limited to pockets of innovation (Franko, 2021). All TEPs must prepare teachers for the reality that they will likely teach in different modalities during their careers. The vision presented in the current paper introduces strategies to prepare all pre-service teachers for OBL.

VISION

The overarching 2025 vision presented in this article is to ensure that all PSTs get access to preparation and experience in K-12 OBL. While a global teacher education vision for 2025 should also include in-service professional development, the purpose of this paper is solely focused on PSTs. There are six objectives set forth to obtain this vision.

1. There must be sufficient course work to give PSTs access to knowledge, skills, and attitudes related to K-12 OBL.

There is a metaphorical pendulum in teacher education (TE) related to attitudes and decisions about educational technology classes (see Mellon, 1999). On one end is the argument for several stand-alone educational technology courses. That idea will suddenly lose traction, favoring instead few to zero standalone courses but rather technology integration in all TE methods or content courses.

Recently, even in the face of COVID-19 and the need to be prepared to teach in online and blended settings, the pendulum has swung away from
standalone educational technology courses. Proof came in the form of a recent email from an unnamed college of education:

Due to state-level requirements to decrease the credit hours for undergraduate teacher education programs, (name) will eliminate the required instructional technology course from the programs of study for several teacher education programs. The new plan is to integrate instructional technology throughout the affected curricula.

The pendulum never seems to rest in the middle. If it did, educators might recognize the value of having both technology-infused methods courses and sufficient standalone educational technology courses as part of a learning continuum (Wang & Chen, 2006; see also Sprague et al., this volume). The word sufficient is used purposely to acknowledge the futility of getting into a debate about the exact number of courses required. Rather, the argument is that we must have program wide and program deep (Schmidt-Crawford et al., 2020) opportunities to prepare PSTs to learn general technology skills, content-based technology strategies, and skill sets critical to teaching in different modalities (Head et al., 2002) like OBL settings.

2. Teacher candidates should have experiences as online learners.

Infusing the TE curriculum with quality technology experiences should include providing PSTs with experiences as online learners (Trust & Whalen, 2020). Such experiences would benefit PSTs through the development of empathy for learners and self-efficacy for teaching. It is believed that PSTs need such empathy as it enhances student learning (Bouton, 2016; Meyers et al., 2019). The authentic experience of PSTs being online learners themselves would help them gain empathy for their future students and the problems or opportunities those students experience.

A review of the literature on teacher self-efficacy revealed that there was still much unknown about teacher self-efficacy and online education but that “additional research and programmes designed to improve teacher self-efficacy in online learning are worth the allocation of time and resources as they can lead to greater student success” (Correy & Stella, 2018, p. 9). Directly related to the experience of emergency remote teaching, Cardullo et al. (2021) recommended that teachers have “opportunities to explore the platforms and to experience success in this environment before they are ex-
posed to the high stakes of preparing students to meet K-12 standards” (p. 32). Further, having PSTs experience the technology of online learning will possibly enhance their self-efficacy with these technological tools (Akcaoğlu & Akcaoglu, 2022).

Lederman (2021) reported that university students were enrolling in more online courses than ever, and that many universities planned to continue offering students the flexibility of offering online courses post-pandemic. Thus, there appears to be ample opportunity for any student, including PSTs to take online classes. The greatest threat to this objective is the potential inexperience of teacher educators, with the possibility that those PSTs may experience poorly designed or facilitated courses. This modeling of poor design or other related negative experiences could decrease their self-efficacy related to online learning.

3. TEP must include field experiences in OBL.

In much the same way that teachers need to experience OBL environments as a student, TE must also provide opportunities for PSTs to undertake field experiences in such environments (Ma et al., 2021). Unfortunately, the recent sudden and dramatic shift to technology-mediated forms of learning exposed this as a gap. While some pedagogical skills from a standard TEP still apply, many of the necessary online teaching competencies are completely new to even recently licensed teachers (An et al., 2021; Davis & Roblyer, 2005).

Ten years ago, Kennedy and Archambault (2012a) reported 1.3% of U.S. TEP provided online field experiences for their PSTs. Five years later, Archambault et al. (2016) found that number had only increased to 4.1%. A replication in Canada found that 32% of TEP offered online field experiences (Archibald et al., 2020). Given the pre-pandemic state of TE, programs will need to start by establishing partnerships with K-12 online schools and brick-and-mortar schools offering OBL. Additionally, standards and instruments to provide constructive feedback for pre-service teacher growth, as well as training for field supervision, will need to be created.

The most concerning findings from these earlier lines of inquiry, and thus the greatest threat to achieving this goal, was the attitudinal data. For example, Kennedy and Archambault (2012a) reported teacher educators stated that “PST learn best to teach by teaching real children in real classrooms in real schools… [or] good teaching must happen in person” (p. 195), which suggested that online or virtual teaching was not real teaching. The authors also found 49% felt TEP should offer online field experiences, al-
though that had decreased to only 40% five years later (Archambault et al., 2016).

4. **Metrics and instruments must be created or refined to further assess and support growth of PSTs knowledge, skills, and attitudes of teaching in K-12 OBL.**

Research has provided evidence of characteristics of quality OBL instructors including but not limited to teachers’ content and pedagogical content knowledge, self-efficacy, beliefs about online and blended instruction, and skills related to instructional development and implementation strategies (Bragg et al., 2021). It should be theoretically possible, therefore, to create metrics and instruments to measure knowledge, skills, and attitudes towards OBL instruction. The hope is to determine if and how a PST might be prepared to teach in such modalities prior to placing them in such contexts.

There are two potential avenues to pursue for a 2025 vision. The first is to acknowledge and then build upon instruments that do exist. For instance, Graham et al. (2019) released a *Blended Teaching Readiness Survey.* Birbal et al. (2018) also provided a PST attitude instrument. Such early efforts need to be used and strengthened through additional validation. Moreover, more instruments could be developed to get at other aspects of blended and online learning, particularly within content areas.

A second and bolder approach is to go beyond self-reported measures with the support of digital innovations. Advanced technologies (e.g., Web 3.0) have brought new and exciting opportunities to score readiness to teach in online and blended modalities. Early exploration has focused on machine learning (e.g., Inyega & Inyega, 2020), learning analytics (e.g., Chen, 2020), and eye-tracking (Langner et al., 2022).

5. **Validated, research-based standards must be developed.**

Historically, standards have embedded the specific knowledge and practices that teachers should possess at the conclusion of their teacher preparation (Santoro et al., 2012; Yinger, 1999). However, a lack of validated instruments has hindered the development of research-based standards (Barbour, 2020). Moreover, the research on K-12 online learning has become so fragmented that “TEPs cannot even determine what future teachers who
may be working in OBL should be exposed to” (Molnar et al., 2021, p. 69).

There has been no shortage of standards in K-12 OBL. For example, Ferdig et al. (2009) identified 13 different sets of documents that considered OBL best practices or standards, while Pulham and Graham (2018) synthesized 18 OBL teaching competency documents. The online teaching standards adopted by the majority of states are the National Standards for Quality Online Teaching (Virtual Learning Leadership Alliance & Quality Matters, 2019; formerly International Association for K-12 Online Learning [iNACOL], 2011). Unfortunately, these standards were not developed using an accepted systematic research process (Barbour, 2020), and efforts to validate them using research after the fact have been flawed or have found the standards to be lacking (Adelstein & Barbour, 2018).

In order to pursue a 2025 vision for TE, there is a need to develop research-based standards for K-12 OBL. At present, the major threat to accomplishing this objective is the presence and adoption of standards that are not based on research and/or that have been developed based on ideological or corporate agendas (Molnar et al., 2021). A validated set of standards would provide accrediting bodies a guide to effective online teaching practices that could be used to hold TEP accountable.

6. Have accrediting bodies and state agencies require that all PSTs have meaningful and useful preparation to deliver OBL.

The objectives listed thus far in the current paper have been ordered purposely, ending with the need to have national accreditation bodies or state teacher preparation agencies require TEPs to ensure that all PSTs have meaningful and useful preparation to deliver OBL. If the first five objectives are achieved, the essential elements will be in place for accrediting agencies to make the requirement. According to the American Association of Colleges for Teacher Education (AACTE) (2022), “the importance of accreditation, particularly its role in assuring that the preparation of professional educators ultimately serves the interests and learning of PK-12 students” (para. 2).

The threat to the objective of having accrediting bodies and state agencies make this requirement is the evidence that they have not already done so. Decades of research and best practices exist for K-12 OBL, yet accreditation bodies have not taken strong positions to require that PSTs complete programs with skills in this area (e.g., Kennedy & Ferdig, 2018). Even with the pandemic, TE accreditors lack strong recommendations regarding TE and OBL. For example, the main national accreditation body for colleges
and schools of education, the Council for the Accreditation of Educator Preparation (CAEP) (2020), recently updated their standards, yet failed to include requirements for OBL.

CAEP (2022) has general statements about technology integration in their standards like “Providers ensure candidates model and apply national or state approved technology standards to engage and improve learning for all students” (R1.3), but a requirement that PSTs are proficient or even exposed to OBL teaching is absent. AACTE (2022) noted that “compliance mandates do not move the profession forward”, but vague language in accreditation standards also fail to support TE programs. Trust and Whalen (2020) observed that teachers have struggled to effectively integrate technology into teaching and learning for decades; teaching in different modalities “created additional stressors and barriers to teaching and learning remotely in times of need” (p. 193). It is time now to require and normalize the preparation of all teachers to teach effectively with technology, including in different modalities such as OBL.

IMPLEMENTATION

To achieve this vision for 2025, specific implementation strategies are required. Suggested strategies are initially offered corresponding to the six objectives explained earlier in this paper.

1. There must be sufficient course work to give PSTs access to knowledge, skills, and attitudes related to K-12 OBL.

This objective for the overall vision is one of the easier to write or talk about (i.e., give them more content in a needed area), but it is one of the most difficult to implement. Student credit hours in TE are at a premium, with multiple areas vying for more time with students (e.g., technology, methods, and content area classes and field experiences). That is why the recommendation, borrowing from the National Educational Technology Plan, suggests program-deep and program-wide implementation rather than a specific number of courses (US DOE, 2017). Individual contexts will help determine when and where different teaching modalities are offered, particularly with the third objective.
It is worth noting that some TEPs will be at a distinct advantage if their educational technology programs are within their TEP. This is not true at every institution, as some colleges have educational technology in other departments or schools. Interdisciplinary communication, engagement with educational technology faculty, and teacher educator professional development regarding technology integration in any context will be critical (Lidolf & Pasco, 2020). Given the variation within TEPs, it is difficult to recommend specific courses. However, teacher educators will want to refer to the fifth vision objective in the present paper (standard development) as well as existing research in K-12 OLB (e.g., Ferdig et al., 2009; Kennedy & Ferdig, 2018) in preparation of such materials.

2. PSTs should have experiences as online learners.

There appears to be more opportunities than ever for university students to take OBL courses (Lederman, 2021). As the goal for this objective is to help these PSTs develop into skilled online teachers there is a need for them to experience a quality online course; the content area may prove to not be important, but it should be a positive experience, as negative experiences can quickly create negative self-efficacy beliefs. To implement empathy building, the empathetic listening work of Baran and Alzoubi (2020) may be helpful to assist PSTs “analyze how different people in the educational community faced new and unprecedented challenges (e.g., food insecurity, Internet access, engagement in remote learning/teaching, homeschooling, and isolation), and how learning and digital technologies could address some of these issues” (p. 370).

It would be especially helpful for the online learning experience to intentionally direct PSTs to the design decisions and course attributes they are experiencing, and a rationale for them grounded in best practices. Finally, while the experience they will have as adult learners may be helpful for establishing empathy and self-efficacy, the experience may not be sufficient as an example of good course design. A well-designed course for adult learners, will likely be designed differently than a course for younger learners. For example, PSTs who plan to become teachers of younger learners, may need special preparation of online pedagogy for those younger learners (see Borup & Archambault, 2019).

Additionally, TEPs should make use of video cases explaining exemplary practice in OLB, or TEPs could engage in the research and development of immersive experiences, possibly extended reality technologies, to help meet the needs for the preparation of PSTs.
3. TEPs must include field experiences in OBL.

TEPs have a long history and established practices of partnering with schools and districts to provide opportunities for their students to undertake field experiences in the brick-and-mortar or face-to-face environment. In order to expand these opportunities to include OBL environments, TEPs will need to undertake a similar process to partner with providers of OBL. The Digital Learning Collaborative (2022) have reported that the largest growth in K-12 OBL is occurring with public school districts implementing their own full-time and supplemental programs, which suggests that existing relationships that TEPs could be leveraged to provide opportunities for OBL field experiences.

Beyond these existing relationships, Kennedy and Archambault (2012b, 2013) described a number of partnerships between TEPs and K-12 OBL programs, one of these programs which was particularly instructive was from the University of Central Florida. Students at the University of Central Florida complete the student teaching experience over a two-semester period. During the first semester, which is often the first semester of the students’ senior year, students complete two 7-week student teaching internships. These students have the opportunity to complete both 7-week internships in a physical or brick-and-mortar environment or students have the option to complete one 7-week internship in a brick-and-mortar environment and one 7-week internship in a virtual school environment. During the second semester, students complete a full 14-week internship. Students have the option to complete this 14-week internship in either a brick-and-mortar or a virtual school environment (Barbour, 2012, p. 508). While it was not a requirement that the PSTs complete any of their student teaching in the virtual school environment at the time of their writing, such field experiences are now even more essential.

4. Metrics and instruments must be created or refined to further assess and support growth of PSTs knowledge, skills, and attitudes of teaching in K-12 OBL.

Perhaps the easiest step to reach this objective is to find, use, replicate, and validate existing instruments. This could be done as a practical activity to begin to set benchmarks and baselines for PSTs. The use of existing metrics and instruments could also be done as replication studies, particularly given the recent calls for more replication research related to educa-
tional technology (e.g., Christensen et al., 2021; Hodges, 2015; Spector et al., 2015). A number of instruments exist which could serve both purposes (see, for example, Archibald et al., 2021; Birbal et al., 2018; Graham et al., 2019; Hung et al., 2010).

A second, more involved next step would be to craft new research tools and instruments that could be used to assess blended and online learning knowledge, skills, and attitudes. This could include surveys, acknowledging the rigor that goes into scale or survey development (Barry et al., 2011). A specific gap in this area exists for surveys and metrics assessing teaching readiness for OBL instruction with content areas. This could also branch into new territories, finding alternative ways to measure practice. Innovative technologies for such purposes range from machine learning and big data analytics to eye tracking and biometric feedback (Hernandez-de-Menendez et al., 2021).

5. Validated, research-based standards must be developed.

The process of standards development is quite similar to the development of metrics and instruments. There are two avenues that could be taken; the first avenue could be to refine or combine existing standards related to online teaching. For example, as part of their development of the National Standards for Quality Online Courses, the Virtual Learning Leadership Alliance and Quality Matters attempted to correlate the iNACOL’ National Standards for Online Courses and the Quality Matters K-12 Rubric, Fourth Edition (Kennedy et al., 2018). However, as noted earlier these efforts have often been hampered by various agendas.

The second avenue could be to develop a new set of standards. The actual process would begin with a review of the literature and existing standards. The results of this review would be shared with a wide range of stakeholders to solicit input (Yinger, 1999). Regardless of which of these avenues is selected, following the initial development of the standards, each discrete standard must be rigorously reviewed against existing research. It would also undergo extensive expert review, followed by field test in a variety of real-world contexts to ensure the standards’ reliability and validity (Adelstein & Barbour, 2018). While there are numerous examples within the field of K-12 OBL of both avenues, none have taken the steps necessary following the initial development to validate their standards.
6. Have accrediting bodies and state agencies require that all PSTs have meaningful and useful preparation to deliver OBL.

If the other objectives detailed here are realized, the pieces will be in place for accrediting bodies to act and include them in their requirements for accreditation. TEPs would have sufficient course work covering research and best practices for OBL, including having PSTs experience being online learners themselves, as well as field experiences in these modalities. Metrics and instruments would exist to further assess and support the growth of PST’s knowledge, skills, and attitudes of teaching in K-12 OBL settings, and standards would be in place.

CONCLUSION

The vision presented in the current paper introduces objectives, threats to achieving them, and implementation strategies to achieve the overarching goal of preparing all PSTs for the reality that they need to be proficient with teaching in OBL modalities. The objectives we have provided are observable and measurable and could, therefore, be used as a checklist to monitor progress toward the vision for 2025.

As the authors are professors and researchers in the field of educational technology, there may be some belief that our vision is biased toward the use of technology in education. However, events since the beginning of COVID-19, have made it clear that OBL is no longer a niche area to be considered by academicians and a relatively few practitioners and learners. All teachers need to be proficient with OBL for a variety of circumstances.

References


