A Scaffolded Model for Preparing Doctoral Students to Teach in Higher Education

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ABSTRACT

Even though effective teaching is required when doctoral students assume positions in higher education, few doctoral programs have courses or formalized experiences designed around pedagogy for undergraduate and graduate students. The lack of pedagogical emphasis is especially concerning for newly minted doctoral students who will be preparing future special educators to teach students with disabilities in K-12 settings. In this article, the Continuum of Teaching Experiences (CTE) Model for preparing doctoral students to teach in higher education is described. This university teaching model depicts practice opportunities that promote pedagogical learning and prepare doctoral students for independent instruction of higher education courses. The CTE model scaffolds opportunities that provide doctoral students with varied entry points across a continuum of possibilities. Additionally, the CTE model is highly adaptable across multiple doctoral preparation programs, emphasizing a malleable framework that can be refined for variable programmatic needs.

KEYWORDS
doctoral preparation, doctoral programs, teacher educators, teaching in higher education, university teaching

Although special education doctoral programs vary across universities, frameworks consistently focus on the three pillars of higher education careers. The first pillar, comprising the majority of doctoral coursework, consists of research knowledge and skills from which students instigate a research agenda and implement corresponding studies, culminating with the dissertation. The second pillar is service, typically characterized by active participation and leadership roles within professional organizations as well as at the university and community levels. The third pillar is teaching courses in higher education. It is the teaching pillar which receives substantially less attention than research and service (Bidabadi et al., 2016; Fulton, 2018; Marx et al., 2016).

It is important to acknowledge concerns that the teaching pillar receives minimal attention because special education doctoral students will prepare future K-12 special educators to teach students with disabilities (SWD). As beginning special educators, their effectiveness in teaching SWD is heavily influenced by the quality of their higher education teacher preparation (Edwards et al., 2014; Utecht & Tullous, 2009). Mayton et al. (2017) noted that when an emphasis on translating research to practice in special education doctoral programs is absent, those doctoral students are less well prepared to train effective K-12 educators. Thus, it is essential to emphasize that teacher educators' instruction is of high quality and maximizes opportunities for teachers to learn and use research-based practices designed for SWD.

In this paper, we examine the issue of preparing doctoral students to teach higher education coursework. First, we describe the need for such preparation. Next, descriptors of knowledge and skills about higher education pedagogy are provided along with the structure for how that content can be delivered. A corresponding continuum of pedagogical experiences with varied entry points is necessary

because special education doctoral students bring a range of experiences in teaching adults to the doctoral program. Subsequently, the bulk of our paper describes a scaffolded model, which was developed as a framework for determining the multiple types of pedagogical experiences that can be accomplished across doctoral programs, thus maximizing doctoral students' experiences.

Need for Doctoral Students' Preparation for Pedagogy

It is surprising that even though effective teaching is required when doctoral students assume positions in the academy of higher education, few doctoral programs offer courses or formalized experiences designed around pedagogy for undergraduate and graduate students (e.g., Chen, 2015; Lynch et al., 2022; Marx et al., 2016). Additionally, there is seldom a planful sequence of mentoring and exposing doctoral students to teaching in higher education in a scaffolded manner, based on their unique background experiences. Even doctoral students who assume roles that require teaching (e.g., graduate teaching assistant, graduate student instructor, teaching assistant, instructor of record) may enter the college or university classroom setting without any, or sufficient, pedagogical preparation in higher education (Bok, 2013; Bonner et al., 2020; De-Chenne et al., 2012). Marx et al. (2016) noted this is prevalent among those with and without K-12 teaching experience. Moreover, Walker et al. (2022) emphasized distinctions between traditional teaching assistant positions designed to support faculty's teaching versus the same positions designed for preparing doctoral students to teach courses. That is, some teaching assistants (TA) are primarily focused on supporting a faculty member with activities such as managing course logistics and grading, while other teaching assistantships involve more mentoring from the instructor/faculty member. In essence, the TA title may sound as if intentional actions for teaching preparation are occurring when in actuality, actions are more supportive roles.

As far back as 2003 (Tyler et al.), 71% of more than 1,000 special education doctoral students reported low satisfaction regarding how well their program prepared them for teaching in higher education. Unfortunately, current data indicate this is still an issue in multiple doctoral programs (Bonner et al., 2020; Fulton, 2018; McNelis et al., 2019; Walker et al., 2022).

Interestingly, the lack of formal preparation for teaching in higher education is an international phenomenon (e.g., Bennett & Turner, 2013; Chen, 2015; Edwards et al., 2011) transcending disciplines, including social work (Maynard et al., 2017), business (Marx et al., 2016), and nursing (McNelis et al., 2019). In doctoral criminology and criminal justice programs, almost half offer no pedagogical preparation for future faculty (Lynch et al., 2022). In contrast, for biology graduate teaching assistants, Reeves et al (2016) proposed three elements in the design of doctoral student preparation to teach in higher education: (a) content, (b) structure, and (c) activities. The content element encompasses what doctoral students should know and be able to do, such as the institutional policies and procedures typically found in syllabi, curricular knowledge, and pedagogical methods. The structure and activities elements involve how doctoral preparation programs will transmit the pedagogical knowledge and skills to doctoral students. Each are briefly discussed next.

Content: Knowledge and Pedagogical Skills Needed

Although special education doctoral students typically have experience teaching K-12 students with disabilities, it is not a natural nor intuitive shift to apply pedagogies for children to college and university students. Adult learners bring prior life experiences to the classroom, can be more self-directed, more motivated, and reflective when applying their learning to practice. Many learning theories and an entire literature base are devoted to informing andragogy, or adult education (Gouthro, 2019; Knowles et al., 2020; Merriam, 2001; Merriam & Bierema, 2014). Teaching adult learners is complex, inclusive of contextual variables doctoral students consider when teaching in higher education. For example, contexts include the type of institution (e.g., research-intensive university), the general class size, the delivery format, as well as graduate and undergraduate students' characteristics (e.g., background experiences) (Reeves et al., 2016). Additionally, teaching online courses requires skills and knowledge that are unique to the online learning environment (e.g., facilitating online student collaboration and communication) (Hew, 2018).

Overall, there is consensus that doctoral students should acquire pedagogical skills of planning, instructing, and assessing graduate and undergraduate students while in their doctoral program (Lederer et al., 2016; Reeves et al., 2016). Before the more complex task of planning out a 15-week sequence of topics for a course syllabus, a doctoral student may first employ a backward planning approach to design a part of a class or just one class (see Wiggins & McTighe, 2005). The teaching session would demonstrate alignment across the identified learning objective(s), the sequence of instructional learning experiences that take place during the session, and the formative assessment technique(s) used to determine if the undergraduates have achieved the identified learning objective(s). When planning a

full syllabus, other skills needed include an understanding of educational standards and policies in postsecondary environments (e.g., academic misconduct, ethical grading practices). In addition to planning, some noteworthy pedagogical skills needed to teach in higher education include using active learning strategies with adult learners and the use of interactive engagement methods of instruction such as effectively monitoring student needs, asking questions, and responding to or eliciting learners' comments and questions (Freeman et al., 2014; Lumpkin et al., 2015).

Bonner et al. (2020) itemize five competencies for doctoral students' preparation for teaching in higher education: (a) expertise in the content; (b) teaching philosophy; (c) course management skills (e.g., grading); (d) skills in instructional design; and (e) skills in varied instructional delivery structures. Further delineation of the last three competencies includes (Bowman et al., 2020; Fulton, 2018):

- Organizing and developing syllabi (e.g., objectives, topics per session, grading);
- Designing activities that elicit students' active involvement;
- Incorporating technology (e.g., as formative assessment; to demonstrate and practice content); and
- Targeting methods to increase inclusivity and recognize diversity in the classroom.

Researchers have found when doctoral students acquire such competencies and corresponding teaching experiences, their self-efficacy increases, affirmatively impacting their confidence in performing specific academic tasks, such as designing content-rich lectures, promoting active engagement, and monitoring students' progress (Boman, 2013; Greer et al., 2016; Lederer et al., 2016; Meadows et al., 2015; Vegara et al., 2013). Moreover, learning to teach

FIGURE 1: Cognitive Apprenticeship mental model sequence
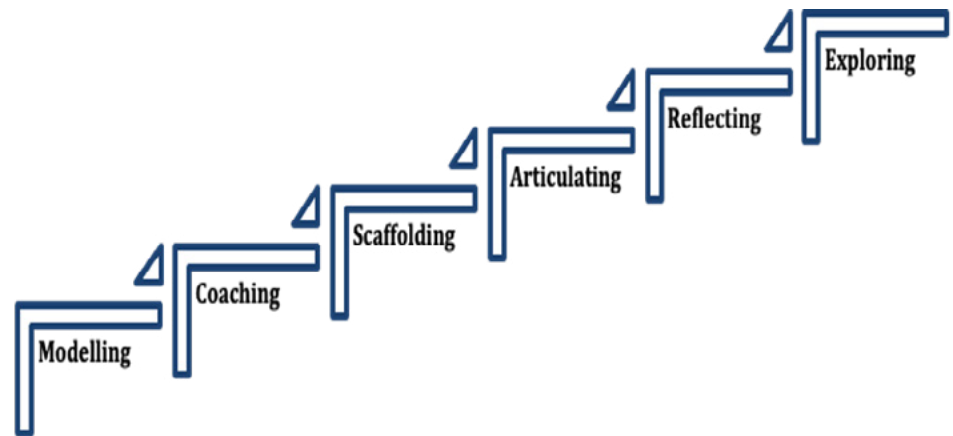
Note. Visual developed using content from Greer et al. (2016)

via multiple modes (e.g., face-to-face, asynchronous, synchronous, hybrid) is also essential, acknowledging the evolution of traditional in-person coursework to varied transmission forums (Bishop-Monroe et al., 2021).

Structure and Activities for Providing Pedagogical Preparation

The literature on *how* university doctoral programs prepare doctoral students to teach higher education courses is limited, with little insight about special education doctoral programs (McCorkle et al., 2022). However, a multidisciplinary body of literature provides exemplars of formats, such as coursework, workshops, and seminars (e.g., Lynch et al., 2022) which are generalizable to special education. The gamut of formats can range from a three-hour bootcamp (Bowman et al., 2020) to a three-credit course, whether face-based, online, or mixed transmission options. In addition to pedagogical coursework, workshops, and seminars, brief guest lecturing opportunities in courses can provide a scaffold for teaching that also exposes doctoral students to multiple faculty. Grossman et al. (2009) point out that multiple practice-based opportunities with reflection encourage one's learning:

Most forms of professional preparation involve opportunities for novices to use their knowledge in a variety of practice settings; the nature of these settings will help shape what they are able to learn. In such settings, novices can experiment with their new knowledge and skills. (p. 2061)

Active practice can also consist of teaching reflections and case-based scenarios followed by discussions augmented by faculty mentorship (e.g., Bonner et al., 2020; Robinson, 2016; Vergara et al., 2014). The latter is typically characterized by an apprentice-style relationship with faculty, which can increase opportunities for practice, often spread over time (e.g., Meadows et al., 2015). Additionally, Lynch et al. (2022) noted benefits of expanding the diversity of faculty exemplars-in-action who serve as mentors because each brings varied skills, unique problem solving approaches, and experiences to the apprenticeship. These opportunities for mentorship can be scaffolded from brief sessions, such as designing and implementing an activity aligned with course outcomes, to independent teaching of a course.

As is discussed in the next parts of

FIGURE 2 : Continuum of Teaching Experiences Model (CTE)

Varied Entry Points	Answering Questions; Monitoring Student Needs	Monitor 1-2 Assignments	Develop Syllabi	Plan One Class/Part of Class	Develop Assignments and Assessments	Plan 2+ Classes	Collaborative Learning and Reflection	Full Responsibilities as Person of Record for Course (Hired for Pay)
Develop Instructional Materials					X			
Observe an Exemplar Professor(s)							X	
Guest Lecture: Pre-Record a Lecture/Talk for Asynchronous Teaching Session				X			X	
^Co-Guest Lecture with a Peer/Faculty (60-90 min)	X			X			X	
^Guest Lecture Independently (60-90min)	x			x			x	
^*Mentor Teaching with an Experienced Instructor**	X	X	(if able)	X		X	X	
^Teach Independently with eCoaching**	X	X	X	X	X	X	X	X
^Teach Independently Using Supports, As Needed	X	X	X	X	X	X	X	X

Note. ** Can be structured as an Independent Study and/or Teaching Internship Experience.   ^ Can be completed Face-to-Face (F2F) or in virtual settings

this paper, the structure and activities for preparing doctoral students to teach in higher education is contingent on the skills the individual brings to the experience. Doctoral students have wide-ranging pedagogical experiential levels. For example, students may enter a doctoral program with no experience teaching adults, whereas others may have delivered brief guest lectures for professional development sessions in their schools, while others may have planned and taught long-term comprehensive professional development courses. Thus, their entry point for higher education teaching ranges. In this paper, we describe a model which can be tailored for doctoral students, based on their background knowledge and skills. The focus of the model is to present a continuum of pedagogical experiences that are conducive to individualization based on doctoral students' background experiences.

THE CONTINUUM OF TEACHING EXPERIENCES MODEL

The Continuum of Teaching Experiences (CTE) model is a scaffolded framework which recognizes doctoral students' need for preparation to teach in higher education, but also acknowledges doctoral students' diverse entry points for such instruction. As operationalized by special education faculty at a mid-Atlantic university on the east coast of the United States, the scaffolded practice opportunities span the duration of doctoral students' preparation. The explicit goal is to promote pedagogical learning and to prepare the individual for effective and independent instruction in higher education courses. The theoretical framework that informs this model is the Cognitive Apprenticeship Theory (Greer et al., 2016).

Theoretical Framework

The *Cognitive Apprenticeship Theory* acknowledges the value of mentorship for the development and retention of future faculty (Collins et al., 1991; Greer et al., 2016). We selected this theoretical framework because it offers a progression of learning and practicing for doctoral students with fading support over time, and results in, increased self-efficacy for teaching (Greer et al., 2016; see Figure 1). Greer et al. (2016) noted the importance of transferring not just the explicit but also the implicit aspects of teaching in higher education. The Cognitive Apprenticeship begins with *modelling* via demonstrating tasks while verbalizing decisions made relative to procedures and techniques when designing and delivering instruction in teacher preparation courses. *Coaching* follows with constructive feedback provided by varied faculty members and peers. Initial feedback while teaching is *scaffolded* over time, as doctoral students' performances indicate proficiency and readiness for more challenging pedagogies. As the doctoral student begins to perform more independently with teaching experiences, they are given opportunities to debrief (*articulate*), *reflect,* and refocus (*exploration*) per the Cognitive Apprenticeship sequence.

The CTE Model

The Cognitive Apprenticeship theory directly influenced the systematic and scaffolded approach we followed for preparing doctoral students to teach undergraduate courses in special education. As is shown in Figure 2, the CTE model identifies representative pedagogical experiences (identified horizontally at the top of the model) with expanding responsibilities as one moves from left to right. The culminating goal of the CTE model is on the far right with the doctoral student independently teaching as a higher education instructor of record. The listed instructional skills are not intended to be comprehensive of the complex pedagogical methods and variations to teaching in higher education, but they depict a scaffolded progression of higher education teaching activities. In addition, these generically described instructional skills are relevant to the changing academic environment, and are inclusive of the evolving delivery modes observed in higher education (i.e., face-to-face, synchronous, asynchronous, bisynchronous, hybrid).

Also, in Figure 2, the continuum of varied entry points for doctoral students are vertically listed on the far-left side of the CTE model. With faculty advisor guidance, doctoral students can enter at any point on the continuum based on their own comfort level and former experiential learning. This continuum captures a range of doctoral students' experiences with teaching; Some may be novices to teaching in any environment, whereas others may come to a doctoral program with knowledge and flexible skills for adapting instruction based on adult learners' needs. An individual's entry point in the CTE model also varies depending on the mode of instructional delivery. For example, a first-semester doctoral student may have experiences delivering numerous guest lectures face-to-face, but in the context of delivering online teaching experiences, observations may be a more appropriate entry point. Following a description as to how the CTE model evolved, each entry point is operationalized.

Development of the CTE Model

The vertical listing in Figure 2 evolved from an initial list the first author had identified as formative, teaching-related activities experienced by doctoral students with a primary specialization in special education. These entry points were then sequenced to show a gradual adoption of more teaching responsibility and autonomy over time. When these activities were then shared with special education faculty who engaged with doctoral students, the continuum of experiences expanded (e.g., developing case studies). Finally, further iterations of the CTE model were made by the authors to increase clarity. A similar evolutionary process can occur for other programs' endeavors to develop a CTE model individualized for and aligned with their unique requirements.

The purpose of developing the CTE model was to organize and systematize a continuum of scaffolded experiences via practice opportunities for doctoral students to engage in throughout their doctoral preparation program. By doing so, doctoral students are provided with individualized, relevant, and meaningful teaching experiences. Each entry point on the CTE model is described next.

Scaffolded Experiences on the Continuum

Develop instructional materials. An initial teaching experience on the contin-

uum involves doctoral students modifying existing course material(s) for a faculty member or developing new material(s) for a higher education class session(s). This may be a common practice for those doctoral students who already work closely with a faculty member in some capacity as part of an assistantship. In this situation, the development of materials is typically led by the faculty member. However, a more autonomous experience is fostered for doctoral students who initiate and lead the development of materials used during course instruction. This type of pedagogical experience could include partial or full development of any of the following: an online module, screencasts, assessment items, a teaching scenario description, a student case study, a graphic organizer, adding content to a presentation (e.g., PowerPoint), an interactive digital learning exercise/game, a video, or organizing and designing folders and documents in a course's learning management system. Development of course material provides doctoral students with the opportunity to consider accessibility and the principles of universal design in higher education (see Burgstahler, 2015; Cumming & Rose, 2021; Reinhardt et al., 2021). Because the instructional material is used by faculty when teaching, ideally, doctoral students observe how their course material was used and how students engaged with the product so that they can then consider any adaptations to be made to the material(s). In addition, the faculty member who uses the material provides feedback to the doctoral student which may also lead to further refinements.

When developing materials for a course in higher education, a doctoral student should take the opportunity to become familiar with accessible, high quality, online materials available for instructional use (e.g., National Center on Intensive Intervention). Additionally,

considerations about scenarios and materials that are culturally responsive for the K-12 student population are crucial and may require exploration in areas not previously considered by doctoral students (e.g., implicit bias via the Equity Coaching Guide). Multiple resources have been developed via current and previous technical assistance and research centers funded by the Office of Special Education Programs. Doctoral students can access these resources to plan and implement instruction for future special educators: https://osepideasthatwork.org/find-center-or-grant/find-a-center.

Observations. Observational learning is grounded in the field of psychology and coined by psychologist, Albert Bandura. For those doctoral students at an early entry point on the continuum, observing teacher models in higher education may help to diminish the ambiguity and uncertainty of teaching tasks. Grossman et al. (2009) describe these visible opportunities as *representations of practice*. Doctoral students can witness faculty models enacting their professional role, engaging in authentic settings, and accessing pedagogical decisions (e.g., how to elicit student thinking; facilitate whole-group discussions). Followed by reflection, the observational experience on the continuum can help shape how doctoral students will approach teaching and learning. These observations involve discourse with the instructor before and after the class session(s). Such discourse includes information about the context of the class, course objectives, the goals for the class session(s), and how students will be assessed. The purpose of the observations in the CTE model is not so much to imitate another teacher, but to generate self-questioning after the observation(s) and for doctoral students to build upon their own pedagogical experiences of how they do/did (or did not) learn from instructors when they were undergraduate or graduate students. This

type of critical reflection along the CTE continuum is an important opportunity for professional introspective learning and growth about one's values, beliefs, and perspectives of self and others (Rodgers, 2002).

Guest lectures. As faculty in academia, it is common practice to invite colleagues to share their expertise on a topic as a 'guest lecturer' in the course. Guest lectures are typically arranged in the planning phase of one's syllabus prior to the onset of the semester. A guest lecturer typically presents to the class for a single session or a portion of a class session (i.e., 30 - 90 min on average). The CTE model explicitly notes scaffolded options for a guest lecture, such as initial activities for doctoral students with minimal background: (a) pre-record an asynchronous session: (b) jointly present with the faculty of the course; and (c) co-present with another doctoral student. That is, the psychological support of teaching alongside a peer or faculty can be less intimidating than teaching alone. Active-learning strategies (e.g., Peer Instruction, Crouch & Mazur, 2001) to engage undergraduates during the lecture can be determined during collaborative planning. Moreover, team-teaching or co-teaching with someone from another complimentary discipline exposes undergraduate learners to effective team teaching modeling and varied perspectives (Coleman et al., 2023; Weiss et al., 2014).
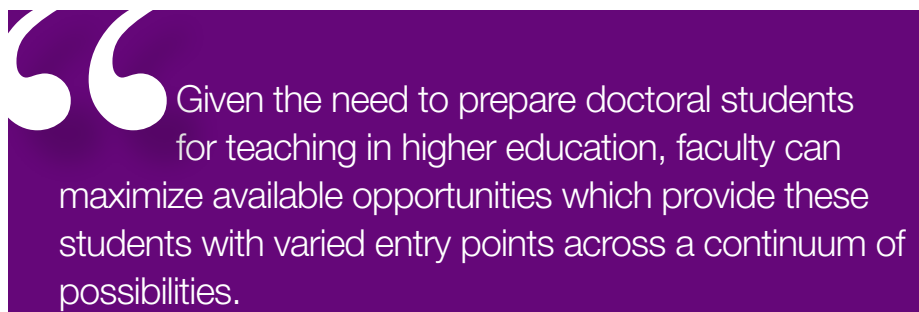
To do a guest lecture in higher education, the doctoral student typically already has expertise in the content (e.g., co-teaching models; explicit instruction; proactive management techniques), aligned with course objectives, to communicate to the class. However, doctoral students' content knowledge alone does not suffice; they must engage in distinct preparatory actions: (a) an initial planning session with the faculty member who teaches the course; (b)

arranging a date and time to present; (c) developing draft presentation material(s) to align with the needs of the audience; (d) providing the draft to the faculty member for review in advance of the guest lecture; (e) finalizing and refining the presentation based on faculty feedback; and (f) reviewing and practicing delivery of the presentation prior to the planned date. Conducting guest lectures or teaching one or two class sessions are meaningful approximations of the practice, or ways to improve teaching (Grossman et al., 2009).

Mentor teaching experience. High-quality mentorship between faculty and doctoral students who will prepare teachers is pivotal for fostering doctoral student preparation for instructional roles (Anderson & Anderson, 2012; McNelis et al., 2019; Richards et al., 2017). These types of mentorships can vary greatly. For example, Michigan State had a year-long program for future science-related faculty that included seminars and hands-on workshops in which a cohort of doctoral students engaged with mentors about teaching and learning (Vergara et al., 2014). In contrast, Starr and DeMartini (2015), describe a formal, one-on-one, faculty-student teaching relationship in which collaborative self-inquiry and self-study inclusive of verbal and written dialogue, interrogation, and observations of each other's teaching took place while each member of the dyad taught a semester-long course, independently. Researchers report that doctoral participants who receive mentorship about teaching in higher education attribute an increased teaching confidence, which they attribute to the mentoring received throughout their doctoral program (Ewen et al., 2012; Lynch et al., 2022; Vergara et al., 2014).

In the CTE model (refer to Figure 2), the mentor teaching experience can involve a doctoral student working with a

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faculty member throughout a substantial portion or semester-long undergraduate or graduate course and participating in varied skills (e.g., planning, lecturing, facilitating discussions, developing materials, assessing student work). In the mentor teaching experience, the partnership between doctoral student and faculty member is determined by a match between course content and the doctoral student's area of study as well as the faculty member's available time for mentoring. However, such mentoring can be mutually beneficial and result in rich time investments for both the doctoral student and faculty member.

In some institutions of higher education, a mentor teaching experience is a 3-credit internship whereby individualized learning objectives are targeted as an independent study. Others may have a less formalized process. Still others may be operating with more fragmentation, such as when some students have opportunities and experiences that all students and faculty are unaware of. Therefore, to benefit both students and faculty, a framework such as the CTE model can make explicit the ways in which higher education teaching is structured for doctoral students in that program. Thus, rather than fragmenting opportunities by which some doctoral students learn to teach in higher education, the CTE model, disseminated to all students and faculty, ensures the continuum of opportunities is evident and available to all.

Teaching independently with

eCoaching. In the CTE model, we integrate feedback and reflection in the development of future teacher educators so that even when doctoral students are independently teaching, the experience is not in isolation, and monitoring and support is provided. Traditional observations as well as intermittent "check in" meetings are scheduled as well as methods for acquiring student feedback at varied intervals during the course. Additionally, virtual observations, such as via eCoaching, can occur.

eCoaching is a scaffold in the model that refers to a non-evaluative approach to providing feedback and supporting the induction of doctoral students who are independently teaching in higher education. Weiss et al.'s (2022) description of eCoaching involves collaborative goal setting between a "coach" and a novice teacher and ongoing exchanges facilitated with technology, virtual observations, video-based analysis, and/ or bug-in-ear (BIE) technology. BIE is a research-based K-12 practice to improve teacher behavior in which an expert mentor provides individualized, real-time coaching focused on targeted instructional behaviors of the teacher (e.g., use of open-ended questions; O'Brien et al., 2021; Rock et al., 2014). Technology is used to remotely deliver encouraging statements and corrective coaching prompts in real time.

The technology used by a faculty coach to provide real-time feedback for a doctoral student via BIE includes an

internet connection, two devices with a webcam, and a Bluetooth headset. The faculty coach and doctoral student each have their own device with a webcam to capture the classroom's video and audio. The faculty coach and doctoral student use a common platform to virtually connect during the doctoral student's instruction. The doctoral student's computer connects to the faculty coach's incoming audio through a Bluetooth headset that rests in the doctoral student's ear. During the live lecture, the faculty coach can privately provide verbal feedback and direction to the doctoral student in real time, as needed. In one study, after receiving encouraging and corrective feedback from the faculty coach via BIE technology to address individualized goals of improving student engagement and increasing use of wait time, two doctoral students who were independently teaching in higher education for the first time changed their instructional behaviors and reportedly valued the opportunity for immediate feedback (see Regan et al., 2017).

Independent teaching w/ ongoing supports. The final point on the continuum is when the doctoral student is hired as the instructor of record to independently teach a course. When doctoral students are hired as the instructor of record, their qualifications are reviewed via the same process as occurs for any other adjunct faculty hired to teach a course. State licensure requirements and other credentials as well as experiences are verified as occurs for other course instructors. Additionally, at least one faculty is responsible for monitoring the doctoral student's performance throughout the course, inclusive of mentoring and regular feedback sessions. For example, at the authors' institution, there are four ways to monitor the instruction of any new instructor. These include (a) direct supervision by a faculty member experienced in the course content, (b)

regular in-service training and support throughout course delivery, (c) planned and periodic evaluations (e.g., self-evaluations, mid-semester input from students), and (d) debriefing using content from the university's student feedback forms. Direct supervision by a faculty member entails, at a minimum, support for syllabi development, classroom observations followed by feedback sessions, and developing solutions for teaching challenges.

SUMMARY

Given the need to prepare doctoral students for teaching in higher education, faculty can maximize available opportunities which provide these students with varied entry points across a continuum of possibilities. The purpose of the CTE model is to provide a framework designed to scaffold varied starting points for doctoral students' higher education instructional experiences. The model is feasible for institutions that (a) prepare doctoral students who wish to teach in academia, (b) have the faculty who are willing to serve in mentorship roles, and (c) have an infrastructure that permits doctoral students to teach university courses before graduating. There are also limitations to consider. Currently, there is no empirical evidence to say that the collective teaching opportunities in the CTE model promote doctoral student learning and lead to teaching excellence. A future study will report doctoral students' perceptions and their mentors' perspectives about the experiences on the continuum. Additionally, determining how these teaching experiences on the continuum impact a doctoral students' self-efficacy for teaching in higher education is needed, as well.

Among the advantages of this framework is that it is highly adaptable across varying doctoral preparation programs, which can promote the smooth transition of doctoral students' teaching as they

shift into early career academia. The model can also be extended to include other positive professional learning practices such as microteaching, used to prepare K-12 teachers, (Benedict et al, 2016) or peer-to-peer evaluations of teaching experiences, used for early career faculty (Servillio et al., 2017). Another advantage of the framework is that doctoral students are not sacrificing their research focus when they acquire skills in higher education pedagogy. Shortlidge and Eddy (2018) found that doctoral students who focused on evidence-based pedagogies for teaching in higher education, experienced a synergy with their research (e.g., quantity of publications). Doctoral programs that intertwine a continuum of teaching experiences within their current curriculum can strengthen those students' preparation to teach in higher education.

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