Old Dominion University

ODU Digital Commons

Communication Disorders & Special Education Faculty Publications

Communication Disorders & Special Education

2022

Practice With Feedback Makes Permanent: eCoaching Through Online Bug-in-Ear During Clinical Experiences

Annemarie L. Horn
Old Dominion University, ahorn@odu.edu

Marcia L. Rock

Follow this and additional works at: https://digitalcommons.odu.edu/cdse_pubs

 Part of the Educational Technology Commons, Education Policy Commons, and the Online and Distance Education Commons

Original Publication Citation

Horn, A. L., & Rock, M. L. (2022). Practice with feedback makes permanent: eCoaching through online bug-in-ear during clinical experiences. *Journal of Special Education Preparation, 2*(1), 58-69. https://doi.org/10.33043/JOSEP.2.1.58-69

This Article is brought to you for free and open access by the Communication Disorders & Special Education at ODU Digital Commons. It has been accepted for inclusion in Communication Disorders & Special Education Faculty Publications by an authorized administrator of ODU Digital Commons. For more information, please contact digitalcommons@odu.edu.

Practice with Feedback Makes Permanent: eCoaching Through Online Bug-in-Ear During Clinical Experiences

AUTHORS
Annemarie L. Horn
Marcia L. Rock

Journal of Special Education Preparation
2(1), 58-69
© 2022 Horn and Rock
Licensed with CC-BY-NC-ND 4.0 License
DOI: 10.33043/JOSEP.2.1.58-69
openjournals.bsu.edu/JOSEP

Correspondence concerning this article should be addressed to Annemarie L. Horn, Old Dominion University, 4501 Hampton Blvd., Norfolk, VA 23529. Email: ahorn@odu.edu

ABSTRACT

Federal mandates (e.g., Every Student Succeeds Act [ESSA], 2015) require special educators to use evidence-based practices (EBP) when working with K-12 students. However, for this expectation to become a reality, teacher educators must make changes in educator preparation program (EPP) curriculum, policy, coursework, and clinical experiences (Kolb et al., 2018). The need for changes in EPP clinical experiences has been underscored by the Council for Exceptional Children's (CEC's) shift from knowledge to practice-based standards for special educators (CEC, 2020). Real-time performance feedback (PF) delivered via online bug-in-ear (BIE) technology is an EBP (Sinclair, 2020) for coaching and supervising during early, mid, and late clinical experiences. In this article, we offer a rationale for making widespread, digital-age changes to coaching and supervising, through online BIE; provide an overview of relevant research; and offer guidance and recommendations for successful online BIE integration during EPP clinical experiences.

KEYWORDS

eCoaching, online BIE, teacher preparation, technology-enabled learning, virtual coaching

The special education workforce faces longstanding shortages and attrition rates (Billingsley & Bettini, 2019), which directly impacts the existing, often inequitable, post-school outcomes of youth with disabilities (Horn, 2021; Mazzotti & Plotner, 2016; Rock et al., 2016). To better serve future teachers and students, it is essential to examine current practice in educator preparation programs (EPP) and offer research-informed recommendations to optimize the learning outcomes of pre-service special education teachers, referred to synonymously as teacher candidates. Although EPP coursework increases the knowledge of teacher candidates, less clear is how to effectively facilitate generalization and sustainability of acquired instructional and behavioral practices in P-12 classrooms (Horn, 2021; McLeskey et al., 2017; 2019; Scheeler, 2008). According to Scheeler (2008), mastery of coursework may not be predictive of teaching effectiveness. That means, in part, there is a need for continued growth and improvement in traditional approaches to pre- and in-service special education teacher learning and development (Scheeler, 2008), particularly during clinical experiences.

Traditionally, clinical experiences have been "poorly defined and inadequately supported" and "the most ad hoc part of teacher education in many programs" (National Council for Accreditation of Teacher Education, 2010, p. 4). Although over a decade of reform has ushered in some improvements, Burns et al. (2016) confirmed more attention and greater resources are warranted, particularly in coaching and supervision. In special education teacher preparation, Nagro and deBettencourt (2017) identified five specific areas for strengthening clinical experience: establishing the scope, identifying target teaching practices, specifying required products, assessing pre-service teachers, and providing ongoing feedback.

TABLE 1: Performance Feedback Delivered through eCoaching using Bug-In-Ear Technology

	EXAMPLE	
Type of Feedback	**Running Commentary**	**Key Words and Phrases**
Encouraging	"Super! Nice job using a think-pair-share partner strategy to engage all the students in generating an example of using fractions, in the real world, for problem solving."	"Excellent response!"
Questioning	"How have you stimulated students' prior knowledge about what they have been learning?"	"Did you praise Jaylen?"
Instructing	"Remember to wait 3-5 seconds when using constant time delay before prompting."	"Keep monitoring him."
Corrective	"Correcting students who are not meeting the expectations is reactive. To establish and maintain a respectful, positive classroom climate for learning and prevent students' challenging behaviors, let students know how you would like them to respond before correcting them."	"Be specific."

Note. Adapted from Rock (2019) and Scheeler et al. (2010). Feedback approaches (e.g., running commentary, key words and phrases) may vary, depending on coach, supervisor, and/or pre-service teacher preferences and response.

Fortunately, advances in technology have enabled researchers to establish a growing body of empirical support centered on technology-based applications used effectively by teacher educators to address these issues and improve EPP clinical experiences (Dieker et al., 2014; Rock et al., 2009; 2017). One such technology-based application, *e*Coaching, centers on coaching and supervising pre-service teachers during real-world and simulated clinical experiences (Dieker et al., 2014).

Rock and colleagues (2014) defined *e*Coaching broadly as "a relationship in which one or more persons' effective teaching skills are intentionally and potentially enhanced through online interactions with another person" (p. 162). Considered a vital component of effectively coaching and supervising pre-service teachers during clinical experiences, performance feedback (PF) increases the likelihood of learning transfer to the classroom (Kretlow & Bartholomew, 2010; Sinclair et al., 2020). In what follows, we describe relevant literature and offer recommendations for strengthening EPPs by embedding real-time PF, delivered through *e*Coaching with bug-in-ear (BIE) technology in early, mid, and late clinical experiences.

Overview of Performance Feedback Provided Via *e*Coaching with Bug-in-Ear Technology

Shute (2008) defined PF as "as information communicated to the learner that is intended to modify his or her thinking or behavior for the purpose of improving learning" (p. 154). In EPPs, the learners are preservice teachers; the coaches and/or supervisors are those who leverage technology to provide PF to preservice teachers. Over the last decade, research on real-time PF with BIE technology (i.e., *e*Coaching) has become more prevalent in the special education literature (e.g., Horn et al., 2020; Horn et al., in press; Rock et al., 2012; 2014; Rosenberg et al., 2020; Scheeler et al., 2018). BIE refers to the audio earpiece worn by the coachee (e.g., pre-service teacher) while receiving immediate, 1:1, in-ear coaching (Scheeler & Lee, 2002). Bluetooth earpieces afford EPP coaches and/or supervisors the opportunity to provide PF online (i.e., remotely from a distance). Conversely, wired and/or wireless FM-based earpieces require the coach and/or supervisor to be on-site to provide PF (Rock, 2009; 2019).

To date, a series of systematic reviews have been published evaluating the methodological rigor of empirical investigations whereby researchers measure the effects of PF, including PF delivered via onsite or online BIE technology (e.g., Cornelius & Nagro, 2014; Fallon et al., 2015; Sinclair et al., 2020; Solomon et al., 2012). Solomon et al. (2012) conducted a meta-analysis of single-case literature on PF, hypothesizing that immediate PF would be more effective in shaping teacher behavior compared to delayed feedback. However, results indicated otherwise; immediate PF and feedback delivered within 24 hours were equally effective (Solomon et al., 2012). By contrast, Fallon et al. (2015) reported that PF is an EBP and found the immediacy of feedback

delivery to contribute directly to a larger effect size. Most recently, Sinclair and colleagues (2020) extended the extant literature on real-time PF by using the CEC's *Standards for Evidence-Based Practices in Special Education* to examine investigations on technology-delivered PF while including gray literature (CEC, 2014). Their findings confirmed immediate technology-delivered PF is indeed an EBP for improving instruction (Sinclair et al., 2020).

Researchers (Scheeler et al., 2004) have also called attention to the quality, consistency, and immediacy of PF delivery provided via BIE as all are critical dimensions of feedback provided during effective *e*Coaching (see examples in Table 1). Scheeler et al. (2004) also stipulated that PF should be specific, corrective, and positive. Importantly, coaches and/or supervisors need to attend to the dimensions and types of PF during clinical experiences if they are to strengthen pre-service teachers' understanding and use of a target instructional, social, emotional, and/or behavioral practice(s) while simultaneously encouraging self-reflection (Cornelius & Nagro, 2014). In short, providing teacher candidates with opportunities to receive individualized, BIE coaching during early, mid, and late clinical experiences encourages transfer of newly learned pedagogy, including evidence-based practices (EBP).

Facilitating Transfer Learning of Evidence-Based Practices

Federal mandates, such as the Individuals with Disabilities Education Act ([IDEA], 2004), ensure students with Individualized Education Plans (IEPs) receive a free, appropriate public education that includes individually-designed, effective, and meaningful instruction; whereas, more recent legislation, such as the Every Student Succeeds Act [ESSA] (2015) requires special educators to use EBPs. EBP is defined as multi-step process that includes the selection, implementation (with fidelity), and assessment of an instructional practice that is deemed to be effective by a sound body of research evidence (Cook & Cook, 2016).

Closely related to EBPs are High Leverage Practices (HLPs) and practice-based evidence (PBE). Based, in part, on EBPs, HLPs include core instructional practices "that have the 'highest leverage for increasing the capacity of novice teachers to improve student outcomes and reach ambitious learning goals" (McLeskey et al., 2019, p. 331). Recognizing that not all EBPs or HLPs work for all students with disabilities, practice-based evidence emerged as the need for "evidence derived from real-world settings and practitioners" (Cook & Cook, 2016, p.144). To facilitate practical application of these practices, a central mission of EPPs involves preparing future special educators to implement EBPs, HLPs, and PBE when they enter the P-12 classroom as beginning teachers.

Scheeler (2008) posited that true mastery of a [teaching] skill is observed through generalization to the natural environment (e.g., classroom). This assertion begs the question: How might teacher educators ensure pre-service special educators not only increase their knowledge of EBPs, HLPs, and PBE through traditional or online coursework, but also generalize and apply their recently gained knowledge and skill, with fidelity, when working in simulated and real-world classrooms with P-12 students? Though some may presume this transfer of learning occurs naturally, research indicates otherwise (e.g., Ericsson et al., 1993; Rock et al., 2017; Scheeler, 2008). For this reason, it is timely and essential to offer teacher candidates opportunities to engage in deliberate practice of EBPs, HLPs, and PBE, during real world and simulated clinical experiences while receiving real-time, 1:1 PF via *e*Coaching with BIE technology.

Supporting EBP, HLP, and PBE Use Through *e*Coaching with Online BIE Technology

In special education EPPs, Scheeler and Lee (2002) and Scheeler et al. (2006) investigated the effects of using BIE to provide on-site, corrective feedback to preservice teachers, and their findings were positive. Intrigued by the potential benefits online BIE could bring to teacher education, Rock and her colleagues (2009) not only pioneered the development of online BIE but also published a foundational study measuring its effects with preservice special education teachers. Their study addressed many of the limitations highlighted in earlier BIE research and introduced an affordable, easy-to-implement, remote method for providing effective PF during clinical experiences (Rock et al., 2009).

Embedding online BIE in EPPs enables teacher candidates to engage in repeated, application-based learning opportunities while receiving immediate PF; thus, promoting practical application and continued use of recently studied EBPs and HLPs (Rock et al., 2014, 2017). Moreover, integrating technology, such as online BIE, during EPP clinical experiences may lead to special educators' sustained use of technology-enabled learning applications beyond initial exposure (Rock et al., 2017). In other words, as preservice teachers embrace technology during clinical experiences, benefiting from the positive effects first-hand, they may be more inclined to turn to technology for professional learning and development in the future. Furthermore, enhanced practice leads to optimal student learning outcomes, and perhaps, simulta-

neously improves special education teacher retention (Horn, 2021).

Improving classroom-based generalization of EBPs, HLPs, and PBE while accounting for fidelity and sustainability strengthens special educator preparation and development (McLeskey et al., 2017). In accord with pioneers of today's technology-based era, making important changes and moving EPPs forward requires teacher educators to accept "widespread adoption of comprehensive 21st century models of teacher development" and embrace the *digital age* (Rock et al., 2016, p. 103). Because the COVID-19 pandemic has added urgency to addressing chronic teacher workforce issues (Will, 2020), while also affording opportunities for digital age change in EPPs (Keefe, 2020), we assert the time is right for expanding major changes underway in EPPs, namely those aimed at improving pre-service teachers' instructional, social, behavioral, and emotional practices (McLeskey et al., 2019) through PF provided via BIE technology (i.e., *e*Coaching), during clinical experiences.

Incorporating *e*Coaching with BIE into Personnel Preparation

In December 2016, personnel in the U.S. Department of Education, Office of Educational Technology, released a groundbreaking brief entitled, "Advancing Educational Technology in Teacher Preparation." In that policy brief, authors issued this clarion call for action:

> The U.S. Department of Education believes it is important that all programs responsible for pre-service teacher training prepare all graduates to effectively select, evaluate, and use appropriate technologies and resources to create experiences that advance student engagement and learning. We call upon leaders of teacher preparation programs to engage in concerted, programmatic shifts in their approach to pre-service teacher preparation (p.4).

Changes of this magnitude, however, take time, money, motivation, and *know how*. Not surprisingly, teacher educators have struggled to integrate technology into EPPs for several reasons, chief among them are time, apathy, incentives, and competing demands, compounded by lack of vision and know how (Kolb et al., 2018). That said, these challenges are not insurmountable.

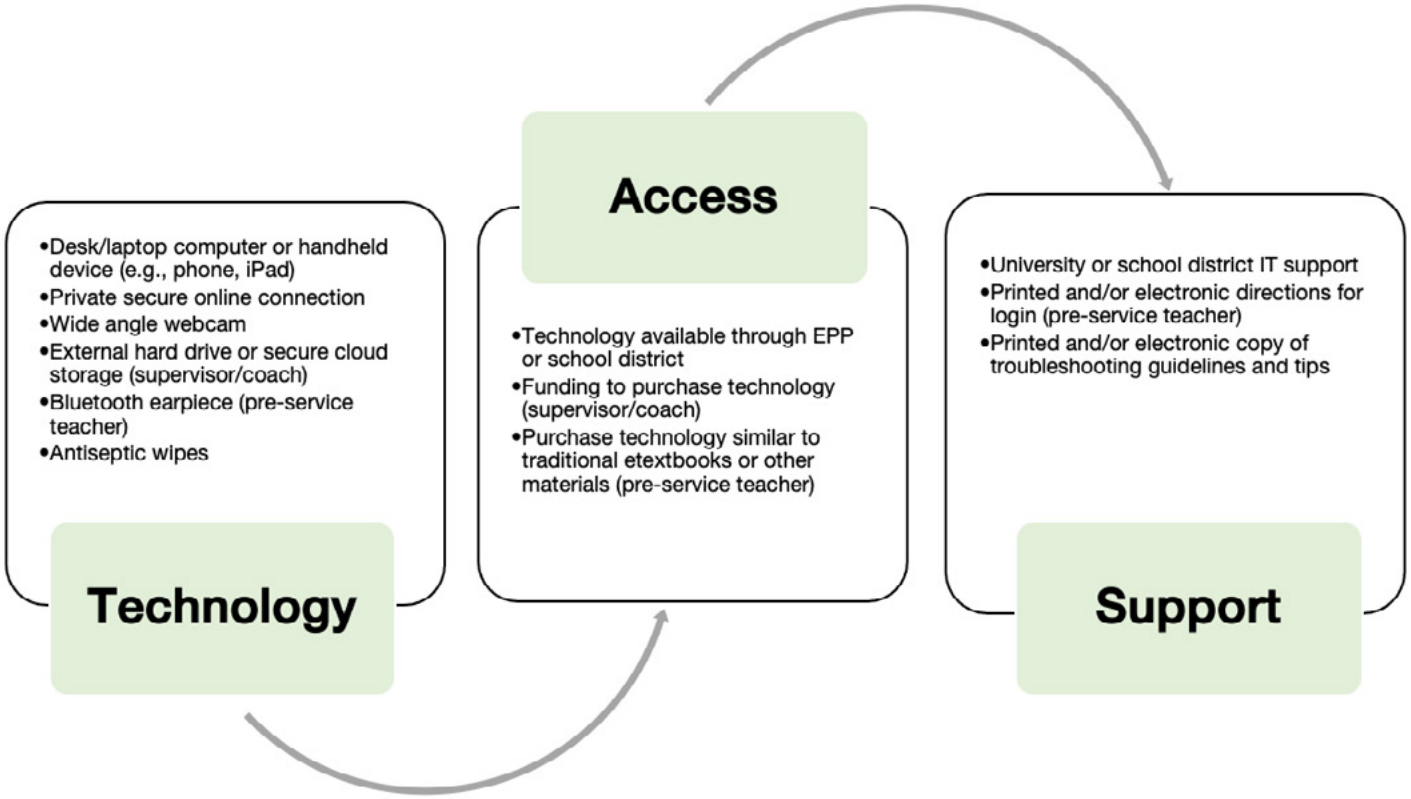
To redesign and improve technology integration in EPPs, Rock and her colleagues (2017) describe a modern vision guided by four principles rooted in technology-enabled learning. The first principle, embedded innovations, refers to using current technology-based methods in special education EPPs. Doing so creates a rich and individualized learning environment where special education teacher candidates receive PF and support based on their individual needs (Rock et al., 2017). The second principle, applied technologies, encompasses various practice-based learning opportunities whereby special education teacher candidates engage in technology-enabled learning with repeated and authentic implementation opportunities (Rock et al., 2017). Examples of technologies include video modeling and mixed-reality classroom simulation (e.g., Mursion™) to provide opportunities for practice and inquiry in a safe, supportive environment (Rock et al., 2017). The third principle, sustained applications, refers to the extent to which special educators' preparation experiences prepare candidates for continued technology-focused learning and improved instruction (Rock et al., 2017). To demonstrate, providing feedback in real-time via *e*Coaching with online BIE technology has been shown to improve instructional practice in pre- and in-service teachers (e.g., Plossel & Rock, 2014; Rock et al., 2009; 2012; 2014) and paraeducators (e.g., Horn et al., 2021; Horn et al., in press) while simultaneously increasing student engagement (Horn et al., in press; Rock et al., 2009; 2014). Finally, the fourth principle, theoretical frameworks, details how theory expands learning by providing a practice-based framework coupled with critical reflection and inquiry (Rock et al., 2017).

For the preceding calls and visions (Rock et al., 2017; U.S. Department of Education, 2016) to become a reality, teacher educators must make changes in EPP curriculum, policy, coursework, and clinical experiences (Kolb et al., 2018). Although all are important changes for teacher educators and researchers to consider, the need for changes in EPP clinical experiences has been underscored by CEC's shift from knowledge to practice-based standards for special educators (CEC, 2020), the American Association of Colleges for Teacher Education's (AACTE's) clarion calls to make clinical practice the center of educator preparation programs (AACTE, 2018), and the Council for the Accreditation of Educator Preparation's (CAEP's) emphasis on high quality, partnership based clinical experiences (i.e., Standard 2; CAEP, 2022).

Outcomes Resulting from BIE Coaching

In this section, given researchers have established real-time PF delivered via online BIE technology as an EBP (Sinclair et al., 2020) for coaching and supervision during early, mid, and late clinical experiences, we offer examples of teacher improvements that have been achieved through practice-based learning opportunities with feedback. Online BIE has been shown to increase practical application of EBPs and improve specially designed instruction not only

FIGURE 1: Technology and Support Needed to Bring Coaching and Supervision into the Digital Age



Note. EEP = educator preparation program; IT = instructional technology.

with K-12 special education pre-service teachers (e.g., Rock et al., 2009; 2012; 2014; Scheeler et al., 2012), in-service teachers (e.g., Cheek et al., 2019; Horn et al., 2020; Ploessl & Rock, 2014), and paraeducators (e.g., Horn et al., in press; Rosenberg et al., 2020; Scheeler et al., 2018) but also early childhood special education pre-service teachers (e.g., Coogle et al., 2020). Notably, the ease and effectiveness of online BIE coaching has been demonstrated across instructional settings as well (e.g., general education classroom, self-contained classroom, community-based setting, mixed-reality classroom simulation; Coogle et al., 2020; Dieker, Rodriguez et al., 2014; Horn et al., 2020, in press; Ploessl & Rock, 2014; Rock et al., 2009; 2012; 2014; Scheeler et al., 2018). Moreover, empirical evidence indicates *e*Coaching with online BIE technology contributes to improvements in P-12 student outcomes.

P-12 Student Outcomes Resulting from BIE Coaching

Overall, qualitative and quantitative data suggest online BIE is beneficial to children and youth. Interestingly, early, site-based BIE research failed to reveal a significant impact on students (Scheeler et al., 2006). That is, the percentage of correct student responses did not reflect significant improvements when pre-service teachers received immediate feedback via BIE on completion of three-term contingency trials (Scheeler et al., 2006). Conversely, findings from Rock and her colleagues (2009; 2014) revealed that student engagement increased as *e*Coached classroom instruction improved (Rock et al., 2009; 2014). In fact, academic engagement continued to improve over time (Rock et al., 2014). Teachers documented changes in student behavior, crediting online BIE for both improved instruction and student engagement (Rock et al., 2009; 2014). More recently, Cheek et al. (2019) used an online module + BIE PF through *e*Coaching to strengthen special educators' use of a text comprehension strategy during literacy instruction. Results from single case research confirmed students with severe intellectual disabilities improved not only their engagement but also their listening comprehension. Rosenberg et al. (2020) investigated the effects of an intervention package whereby paraeducators were trained to use incidental teaching to teach self-advocacy statements while receiving online BIE coaching. Student performance data indicated that all four K-12 students independently used target self-advocacy statements as a result of the intervention (Rosenberg et al., 2020). Horn et al. (2020) measured stu-

dent performance as a special education teacher received online BIE coaching in a community-based setting. Findings showed all student participants reached acquisition as a result of the teacher receiving online BIE coaching while implementing an EBP.

Horn et al. (in press) examined social and communicative responses to praise in students with autism spectrum disorder (ASD) as paraeducators received online BIE coaching on their use of behavior specific praise (BSP). Student response data indicated that as paraeducators increased the percentage and rate of BSP, the occurrence of eye contact, changes in facial expression (e.g., smile), and verbalizations/vocalizations increased in students simultaneously. Coogle and colleagues (2020) also reported improved expressive communication in preschoolers with ASD. In sum, researchers have clearly demonstrated positive outcomes for children and youth when online BIE coaching is used to increase use of EBPs, HLPs, and PBE in P-12 classrooms.

BIE BENEFITS AND CHALLENGES

Integrating online BIE in EPPs to provide pre-service special education teachers with PF during early, mid, and late clinical experiences yields several distinct advantages.

Cost-Effective Advantages

BIE technology has been described as affordable, easy-to-implement, and applicable across geographic locations (Horn, 2021; Rock et al., 2009). Advancements in technology have decreased expenses associated with online BIE and aided in the ease of implementation. For instance, BIE once required FM radio technology with restricted transmitting abilities that required on site (or in person) use (Scheeler & Lee, 2002; Scheeler et al., 2006). Now, online BIE allows for remote PF to be provided via mobile and web-based technologies (Horn et al., 2020; Rock et al., 2009, 2014). These revolutionary developments to BIE technology have enabled teacher educators to provide coaching and supervision to more pre-service teachers during early, mid, and late clinical experiences.

Rock and colleagues (2011) provide a detailed breakdown of the inexpensive technology needed for online BIE coaching. Importantly, the technology has changed little and remained affordable. The online BIE technology needed by pre-service teachers includes a Bluetooth earpiece (approximately $20), a handheld device with a built-in camera that has live-stream capabilities (e.g., iPad Mini®; approximately $300), and a tripod or similar device to secure the camera (approximately $25). eCoaches, supervisors, and mentor teachers require a computer or handheld device (e.g., iPad®) with built-in speakers (approximately $400) and a headset with a built-in microphone (approximately $30). As reported in Figure 1, the low-cost equipment required for practical application can be purchased online, similar to the cost of a textbook or other required materials, in campus bookstores, or, better yet, technology may be readily available for check out and use through universities or school districts. For those pre-service teachers who live or work too far from the university to check out necessary technology, we have had success with and recommend mailing the necessary components. If universities or school districts are under-resourced and cannot purchase the necessary technology, we have had success with and encourage personnel to apply for small and/or large grants as well as work with development personnel to secure dedicated funds.

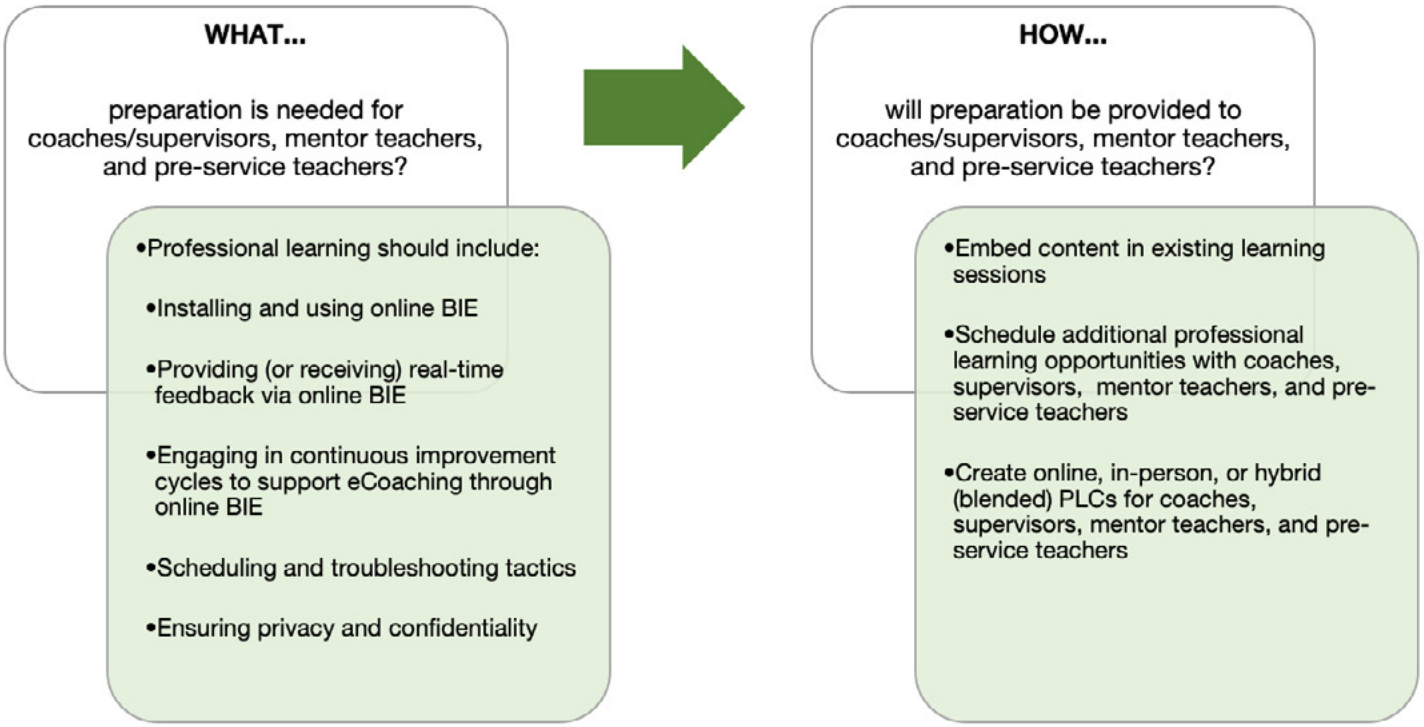
In addition to overall affordability, offering technology as a means for a coach or supervisor to provide PF to pre-service teachers from a remote, online location is cost-saving (Rock et al., 2009, 2014). Traditionally, classroom observations during clinical experiences involve in-person site visits from a coach or supervisor, which requires time and travel. A considerable amount of time is spent in the car driving from school to school, and mileage and gasoline expenses accrue (Rock et al., 2009). By contrast, online BIE technology affords EPP coaches and supervisors an opportunity to provide empirically-supported feedback without leaving their home or office (Rock et al., 2009, 2014). Cutting out or substantially reducing extensive time and travel expenses enables coaches/supervisors to provide feedback to preservice teachers during clinical experiences in an economically-friendly, efficient manner.

Pedagogical Benefits

Given not only the longstanding achievement gaps between students with disabilities and their peers (National Center for Education Statistics, 2019) but also the alarming suspension and expulsion disparities experienced by preschoolers (Zeng et al., 2020) and school-age children and youth with disabilities (United States Government Accountability Office [GAO], 2018), it is essential for special educators to enter the classroom prepared to meet the academic, social, emotional, and behavioral needs of today's increasingly diverse P-12 population. Thus, as teacher educators make substantive changes to EPP curriculum, it is vital they include science-backed approaches aimed at improving preservice special educators use of EBPs, HLPs, and PBE.

According to Ericsson et al.'s (1993) foundational research across various disciplines, effective approaches for improving professional knowledge and practice center on providing deliberate,

FIGURE 2: Digital Age Content and Pedagogical Preparation with Online BIE Technology



Note. BIE = Bug-In-Ear; PLC = professional learning community.

systematic, and ample opportunities to practice specific skills or learning activities with feedback. Integrating online BIE in EPPs during early, mid, and late clinical experiences reflects Ericsson's (1993) findings in that it transforms static, after-the-fact approaches to coaching and supervision into dynamic, immediate, deliberate practice opportunities. Consequently, improved learning is not only observed in preservice special educators but also the P-12 children and youth with disabilities whom they teach. Integrating online BIE in this way during clinical experiences also helps to connect methods courses and clinical experiences in EPPs (see Figure 2). In short, by no longer leaving the development of pedagogical skills to chance (McLeskey et al., 2019), *e*Coaching through online BIE holds promise for future and current special educators by offering an innovative, yet easy-to-implement method for increasing practical application of EBPs, HLPs, and PBE.

Social Validity Benefits

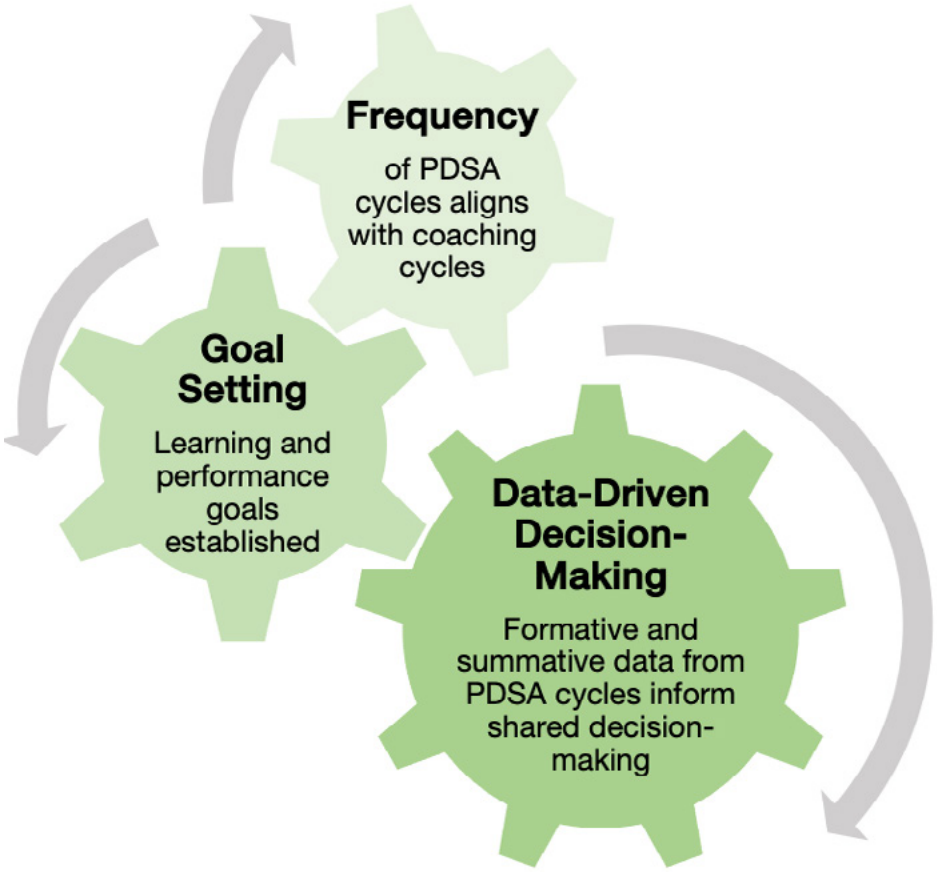
Across P-12 online BIE studies (e.g., Coogle et al., 2020; Horn et al., 2020; Horn et al., in press; Rock et al., 2009; 2014; Scheeler et al., 2006; 2018; Wake et al., 2017), social validity data indicate *e*Coaching with BIE is perceived favorably by all involved. Dating back two decades, Scheeler and Lee (2002) reported teacher participants viewed immediate feedback delivered via BIE to be valuable and unintrusive to instruction. Similarly, social validity reports in the Scheeler et al. (2006) investigation echoed earlier findings and all participants found BIE to be beneficial. As online BIE technology has evolved, social validity reports have become more prevalent in the literature and remain positive (e.g., Horn et al., 2020; Horn et al., in press; Rock et al., 2009; 2014; Scheeler et al., 2018; Wake et al., 2017). Those who participate in live streamed (e.g., Skype, WebEx, Zoom) online BIE coaching sessions have consistently professed the intervention to be effective, as measured by improving teaching behavior; efficient, as measured by the rate of acquisition of the target teaching behavior; and feasible, as measured by classroom applicability (Horn et al., 2020, in press; Rock et al., 2009; 2014; Scheeler et al., 2018).

Digital Divide Constraints

Davis et al. (2007) defined digital equity as "equal access and opportunity to digital tools, resources, and services to increase digital knowledge, awareness, and skills" (p. 9). Willems (2019) expanded digital equity to include the distribution of technology-related resources (e.g., equipment, Internet, unbiased, uncensored content) based not only on need but also on the awareness, skills, and knowledge required to use technology for educational purposes. According to the 2018 Horizon Report (Adams Becker et al., 2018), digital inequities continue to impede the adop-

tion of digital technologies in higher education, including EPPs, and other professional learning spaces (Willems, 2019). For these reasons, when moving coaching and supervising in EPPs from in person to online or hybrid (blended) formats, the digital divide must be considered and addressed not only for pre-service teachers, clinical coaches/supervisors, teacher educators, mentor teachers, but also their respective EPPs (i.e., Institutions of Higher Education, school districts, community providers). This includes considering geographic location (e.g., urban, suburban, rural) and access to BIE technology and the Internet. Failure to do so will likely ensure that deeply rooted digital inequities remain intact in EPPs.

FIGURE 3: Implementing Continuous Improvement Cycles with Online BIE Coaching



Note. EPP = educator preparation program; PDSA = Plan-Do-Study-Act.

The Challenges of Online BIE Technology Reliability and Breakdowns

To facilitate widespread adoption of online BIE in EPPs, it is essential to be aware of the pitfalls, while also recognizing advancements in online BIE technology. Rock and her colleagues (2012) were successful in overcoming tech-related obstacles encountered during the pioneering Rock et al. (2009) online BIE investigation. Specifically, when the eCoach shifted from a PC (Rock et al., 2009) to a Mac (Rock et al., 2012), there were fewer disruptions due to technology issues, and audio and video recordings were more reliable. Changes in the physical location of the eCoach were also considered in the Rock et al. (2012) study to mitigate poor bandwidth. Horn et al. (2020) relied on Mac devices for recording and coaching during online BIE sessions and minimal issues related to low bandwidth were reported. By contrast, Horn et al. (in press) used a Mac device (iPad mini) for those receiving online BIE coaching while the eCoach was logged in via live stream from a PC. Bandwidth issues were not reported, and there were few to no technology related disruptions. Clearly, advances in technology over the years have improved reliability of online BIE.

The Challenge of Acclimating to Online BIE and Improving Instructional Practice

Researchers have confirmed that transfer learning rarely occurs through traditional, didactic-based training methods (Joyce & Showers, 2002). However, online BIE holds promise in terms of effectively improving the occurrence and fidelity of EBPs and HLPs in the classroom context. Like anxiety experienced during on-site classroom observations, it is not uncommon for those involved in BIE coaching to feel apprehensive initially (Korner & Brown, 1952; Rock, 2019). Based on Korner and Brown's (1952) early work, Rock (2019) also found it can take three to four sessions for individuals to process multiple sources of incoming auditory stimuli and overcome initial anxiety.

Increasing the level of comfort while also improving instructional practice is largely contingent on the quality of PF received via online BIE technology. Rock (2019) offers recommendations for eCoaches, all of which are designed to be individualized and facilitate a successful online BIE coaching experience, such as scaffolding. Scaffolding allows the coach or supervisor to offer immediate, deliberate, systematic feedback that incrementally improves the special

educators' use of EBPs, HLPs, and/or PBE while he, she, or they are teaching (Rock, 2019), rather than talking about it after the fact. Not only does the feedback provided through online BIE provide invaluable support for learning transfer (Coogle et al., 2020; Horn et al., 2020; Ploessl & Rock, 2014), it also prompts a cycle of in-action reflection that contributes to immediate and longer-term improvements in their instructional practice (e.g., Rock et al., 2009, 2012; 2014). Over time, the result is often increased confidence and effectiveness and decreased frustration and anxiety.

Cultivating Successful Wider Spread Adoption of Online BIE in Educator Preparation

Over a decade ago, pioneering participants who received online BIE coaching called for its widespread adoption in EPPs (Rock et al. 2009). Although the COVID-19 pandemic resulted in increased opportunities for pre-service teachers' participation in virtual clinical experiences (Bouffard, 2020), widespread use of online BIE coaching and supervising has remained elusive in EPPs. Aligned with practice-based and clinical experience initiatives, such as the CEEDAR Center and CEC's High Leverage Practices initiative (Benedict et al., 2016), CEC's Practice Based Standards for Special Educators (CEC, 2020), CAEP Standard 2 (CAEP, 2022), and AACTE's call to unite EPPs through clinical practice (AACTE, 2018), promoting widespread integration of coaching and supervising through online BIE, during clinical experiences, in EPPs is timely and necessary. To support teacher educators and stakeholders in this endeavor, we suggest using continuous improvement cycles while engaging in *e*Coaching (Rock, 2019) with online BIE technology (see Figure 3). As the name implies, this cyclical process involves collaborative, data-informed decision-making, routine goal setting, and ongoing reflection aimed at incrementally strengthening pre-service teachers' use of EBPs, HLPs, and PBE, during early, mid, and late clinical experiences.

Additionally, we encourage teacher educators and stakeholders to make use of the step-by-step guide developed by Regan and Weiss (2020). Step 1 emphasizes the importance of training the eCoach prior to transitioning to Step 2, which involves training special education teacher candidates alongside eCoaches, supervisors, and mentor teachers. Step 3 highlights the need to have at least one observation session (i.e., a baseline session without delivering PF), followed by a post-observation conference, wherein the eCoach and pre-service teacher (preferably with the mentor teacher as well) have an opportunity to debrief about the session, build rapport, and establish goals. Step 4 centers on the online BIE coaching experience, which includes the process in its entirety from logging in to connecting online, providing/receiving real-time feedback, to collecting data on instructional, social, emotional, and behavioral teaching practices. Step 5 includes the debriefing process that either follows the online BIE session immediately or takes place within 24 hours (Regan & Weiss, 2020).

Because many faculty in EPPs have often floundered when integrating technology into EPPs (Kolb et al., 2018; U.S. Department of Education, 2016), they will likely need support that extends beyond step-by-step guidelines. The comprehensive approaches needed for technological and pedagogical improvements include dedicated release time, necessary technology resources, effective professional learning, and ongoing peer support teams (Kolb et al., 2018) –all of which come with various costs. Yet, as Kolb and colleagues (2018) pointed out, there are no clear-cut guidelines available for EPP investments in technology and professional development. That means teacher educators and other EPP stakeholders need to develop budgets based, in part, on public school guidelines (e.g., approximately $1,000 annually per student for technology and 60 hours of professional learning and development; see Kolb et al., 2016; Odden & Picus (2011).

eCoaching with BIE Technology-in-Action: A Vignette

In this section, drawing on over a decade of professional experience and research providing PF to pre-service teachers though BIE technology in EPPs, we offer a vignette to further illustrate and facilitate application.

Faye, a pre-service special education teacher, was thrilled to begin her clinical placement at a local high school. She had excelled in her coursework throughout her EPP and felt confident entering the classroom and working with secondary students with disabilities. However, during the third week in her placement, Faye became discouraged. She struggled to keep students engaged while she was teaching, quickly realizing that it was more challenging than she expected to apply acquired skills when working with actual students. Faye's cooperating teacher, Ms. Brooks encouraged Faye to provide more opportunities to respond (OTR) and use behavior specific praise (BSP), as both have been shown empirically to increase student engagement. Despite Faye's best efforts, she continued struggling, and the frequency and intensity of off-task student behaviors increased.

Fortunately, Faye's clinical supervisor was scheduled to offer eCoaching support. That is, advanced technology enabled Faye's clinical supervisor, Dr. Crimmins, to provide immediate feed-

back while she was actively teaching. Faye wore a Bluetooth earpiece, which facilitated two-way communication, and an iPad mini was positioned in the classroom to live-stream her lesson. Dr. Crimmins logged in during the scheduled time and provided corrective feedback and praise from her university-based office located 40 miles away. Faye and Dr. Crimmins discussed some of her current challenges and target skills she wished to improve. Through her coursework, Faye demonstrated her understanding of OTR and BSP, the challenge was applying these skills in the classroom. Faye was nervous initially, but Dr. Crimmins assured her she was there to support her, not simply evaluate her. Throughout the session, Dr. Crimmins prompted Faye to increase her rate of both OTR and BSP. Faye quickly realized that she was giving high rates of praise, albeit it was not specific. Instead, Faye said "good job" to students frequently. It wasn't until she received immediate feedback, prompting her to "be specific" or questioning her (e.g., "Good job what?") that she realized this.

Faye's performance improved during the very first session, but there was more work to be done; she needed more practice with feedback. Dr. Crimmins eCoached Faye for approximately 15 minutes a day, and naturally scaffolded the prompting (e.g., increasing and decreasing feedback in accord with teacher and student performance, during instruction). Within two weeks, Faye was using OTR and BSP accurately and with high fidelity. Faye's cooperating teacher was amazed not only by her progress but also by her students' increased engagement, which confirmed the importance of providing OTR and using BSP. Providing immediate feedback via online BIE proved to be effective in terms of supporting pre-service teachers' transfer learning and having a positive impact on K-12 students. Moreover, the approach was efficient, as the clinical supervisor provided all feedback from her university-based office as opposed to traveling to make site visits. Reductions in travel time allowed her to provide more pre-service teachers with PF through online BIE technology.

Conclusion

Since the 1950s, coaches, supervisors, and researchers, have used in person and online BIE technology effectively to prepare pre- and in-service education professionals (Horn et al., 2020, in press; Rock et al., 2009; 2012; 2014; Rosenberg et al., 2020; Scheeler et al., 2002; 2006; 2018), including special education teacher candidates. Based not only on the growing body of literature in online BIE coaching and supervising, but also on alignment with CEC's practice-based standards for special educators (CEC, 2020), AACTE (AACTE, 2018) and CAEP's Standard 2 (CAEP, 2022) emphases on clinical experiences, we proffer it is time to promote widespread integration of online BIE use in digital age EPPs. Rather than accepting digital inequities and/or ignoring the roles digital technologies play in 21st century work, life, and learning, teacher educators and researchers should embrace technology-enabled learning in EPPs in ways that foster optimal outcomes for pre- service special educators and the students whom they serve.

References

Adams Becker, S., Brown, M., Dahlstrom, E., Davis, A., DePaul, K., Diaz, V., & Pomerantz, J. (2018). *Horizon Report 2018: Higher Education Edition*. EDUCAUSE. Retrieved January 5, 2022, from https://www.learntechib.org/p/184633/

American Association of Colleges for Teacher Education (2018). A *Pivot Toward Clinical Practice, Its Lexicon, and the Renewal of Educator Preparation.* Washington, D.C. https://aacte.org/resources/research-reports-and-briefs/clinical-practice-commission-report/

Benedict, A., Holdheide, L., Brownell, M., & Foley, A. M. (2016). *Learning to teach: Practice-based preparation in teacher education* (Issue brief). Collaboration for Effective Educator Development, Accountability and Reform and the Center on Great Teachers and Leaders. https://files.eric.ed.gov/fulltext/ED570144.pdf

Billingsley, B., & Bettini, E. (2019). Special education teacher attrition and retention: A review of the literature. *Review of Educational Research,* 89(5), 695-744. https://doi.org/10.3102/0034654319862495

Brock, M. E., & Carter, E. W. (2013). A systematic review of paraprofessional-delivered educational practices to improve outcomes for students with intellectual and developmental disabilities. *Research and Practice for Persons with Severe Disabilities,* 38(4), 211-221. https://doi.org/10.1177/154079691303800401

Bouffard, S. (2020). Technology moves from resource to lifeline. *The Learning Professional: The Learning Forward Journal,* 41(4), 38-40.

Burns, R. W., Jacobs, J., & Yendol-Hoppey, D. (2016). Preservice teacher supervision within field experiences in a decade of reform: A comprehensive meta-analysis of the empirical literature from 2001 to 2013. *Teacher Education and Practice,* 29(1), 46+. https://link.gale.com/apps/doc/A552763150/AONE?u=anon~8ef1afb2&sid=googleScholar&xid=d12ef7c6

Cheek, A.E., Rock, M.L., & Jimenez, B.A. (2019). Online module plus *e*Coaching: The effects on special education teachers' comprehension instruction for students with significant intellectual disability. *Education and Training in Autism and Developmental Disabilities Journal*, 54 (4), 343-359.

Coogle, C. G., Ottley, J. R., Storie, S., Rahn, N. L., & Kurowski-Burt, A. (2018). Performance-based feedback to enhance preservice teachers' practice and preschool children's expressive communication. *Journal of Teacher Education,* 71(2), 188-202. https://doi.org/10.1177/0022487118803583

Cook, B. G., & Cook, L. (2016). Leveraging evidence-based practice through partnerships based on practice-based evidence. *Learning Disabilities: A Contemporary Journal,* 14(2), 143–157. https://files.eric.ed.gov/fulltext/EJ1118435.pdf

Council for Exceptional Children. (2014). *Council for exceptional children standards for evidence-based practices in special education.* Retrieved December 15, 2021, from https://cecpioneers.exceptionalchildren.org/sites/default/files/2021-04/EBP_FINAL.pdf

Council for Exceptional Children (2020). *Initial practice-based professional preparation standards for special educators.* Retrieved December 15, 2021, from https://exceptionalchildren.org/standards/initial-practice-based-professional-preparation-standards-special-educators

ABOUT THE AUTHOR

Annemarie L. Horn

Annemarie L. Horn, Ph.D. is an Assistant Professor in the Department of Communication Disorders and Special Education and the K-12 Special Education Adapted Curriculum Program Coordinator at Old Dominion University. Dr. Horn's research interests include technology-enabled professional learning and development for pre- and in-service special education teachers and paraeducators, implementing evidence-based practices in school and community settings when teaching students with intellectual and other developmental disabilities, and postsecondary transition.

Marcia L. Rock

Marcia L. Rock, Ph.D. is a Professor in the Department of Specialized Education Services and Graduate Studies Director as well as Ph.D. Program Director, at the University of North Carolina Greensboro. Dr. Rock's research interests include pre- and in-service teacher development, technology enabled coaching, workforce systems thinking and change, research practice partnerships, inclusive and special education, behavioral health, and social, emotional learning.

Council for the Accreditation of Educator Preparation CAEP (2022). *2022 Initial Level Standards.* Retrieved December 15, 2021, from http://caepnet.org/~/media/Files/caep/standards/2022-initial-standards-1-pager-final.pdf?la=en

Cornelius, K. E., & Nagro, S. A. (2014). Evaluating the evidence base of performance feedback in preservice special education teacher training. *Teacher Education and Special Education,*37(2), 133–146. https://doi.org/10.1177/0888406414521837

Davis, T., Fuller, M., Jackson, S., Pittman, J., & Sweet, J. (2007). A National Consideration of Digital Equity. *International Society for Technology in Education*. http://www.iste.org/digitalequity

Dieker, L. A., Kennedy, M. J., Smith, S., Vasquez III, E., Rock, M., & Thomas, C. N. (2014). *Use of technology in the preparation of pre-service teachers* (Document No. IC-11). University of Florida, Collaboration for Effective Educator, Development, Accountability, and Reform Center. https://ceedar.education.ufl.edu/wp-content/uploads/2014/10/IC-11_FINAL_05-26-15.pdf

Dieker, L. A., Rodriguez, J. A., Lignugaris/Kraf, B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education,* 37(1), 21-33. https://doi.org/10.1177/0888406413512683

Ericsson, K. A., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review,* 100(3), 363-406. https://doi.org/10.1037//0033-295X.100.3.363

Every Student Succeeds Act, 20 U.S.C. § 6301 (2015). https://congress.gov/114/plaws/publ95/PLAW-114publ95.pdf

Fallon, L. M., Collier-Meek, M. A., Maggin, D. M., Sanetti, L. M. H., & Johnson, A. H. (2015). Is performance feedback for educators an evidence-based practice? A systematic review and evaluation based on single-case research. *Exceptional Children,* 81(2), 227-246. https://doi.org/10.1177/0014402914551738

Horn, A. L., (2021) eCoaching in rural settings when teaching secondary students with intellectual and other developmental disabilities [Special issue]. *Rural Special Education Quarterly,* 40(3), 167-175. https://doi.org/10/1177/87568705211027980

Horn, A. L., Gable, R. A., Bobzien, J. L., Tonelson, S. W., & Rock, M. L. (2020). Teaching young adults job skills using a constant time delay and *e*Coaching intervention package. *Career Development and Transition for Exceptional Individuals,* 43(1), 29-39. https://doi.org/10.1177/2165143419828983

Horn, A. L., Rock, M. L., Douglas, K., Bean, K., Layden, S. J., & Roitsch, J. (in press). The effects of teacher delivered bug in ear coaching on paraeducators and students. *Education and Training in Autism and Developmental Disabilities.*

Joyce, B., & Showers, B. (1982). The coaching of teaching. *Educational Leadership,* 40(1), 4–10. https://files.ascd.org/staticfiles/ascd/pdf/journals/ed_lead/el_198210_joyce.pdf

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Association for Supervision and Curriculum Development.

Keefe, E. S. (2020). Learning to practice digitally: Advancing preservice teachers' preparation via virtual teaching and coaching. *Journal of Technology and Teacher Education* 28(2), 223-232. https://www.learntechlib/org/primary/p/216145/

Kolb, L., Kashef, F., Roberts, C., Terry, C. & Borthwick, A. (2018). *Challenges to creating and sustaining effective technology integration in teacher education programs.* [Conference paper]. AACTE Annual Conference, Baltimore, MD. https://conference.iste.org/uploads/ISTE2018/HANDOUTS/KEY_110813364/ChallengestoCreatingandSustainingTechnologyIntegrationininTeacherEducationPrograms2.pdf

Korner, I. N., & Brown, W. H. (1952). The mechanical third ear. *Journal of Consulting Psychology,* 16, 81-84. https://doi.org/10.1037/h0061630

Mazzotti, V. L., & Plotner, A. J. (2016). Implementing secondary transition evidence-based practices: A multi-state survey of transition service providers. *Career Development and Transition for Exceptional Individuals,* 39(1), 12-22. https://doi.org/10.1177/2165143414544360

McLeskey, J., Billingsley, B., Brownell, M. T., Maheady, L., & Lewis, T. J. (2019). What are high-leverage practices for special education teachers and why are they important? *Remedial and Special Education,* 40(6), 331-337. https://doi.org/10.1177/0741932518773477

McLeskey, J., Barringer, M-D., Billingsley, B., Brownell, M., Jackson, D., Kennedy, M., Lewis, T., Maheady, L., Rodigues, J., Scheeler, M. C., Winn, J., & Zielger, D. (2017). *High-leverage practices in special education.* Arlington, VA: Council for Exceptional Children and CEEDAR Center. https://ceedar.education.ufl.edu/wp-content/uploads/2017/07/CEC-HLP-Web.pdf

Nagro, S. A., & deBettencourt, L. U. (2017). Reviewing special education teacher preparation field experience placements, activities, and research: Do we know the difference maker? *Teacher Education Quarterly,* 44(3), 7–33. https://www.jstor.org/stable/90010901

National Center for Education Statistics. (2019). *Nation's report card. National Assessment of Educational Progress.* Retrieved December 15, 2021, from https://nces.ed.gov/nationsreportcard/

Odden, A., & Picus, L. O. (2011). Improving teaching and learning when budgets are tight. *Phi Delta Kappan*, 93(1), 42-48. https://doi.org/10.1177/003172171109300107

Ploessl, D. M., & Rock, M. L. (2014). eCoaching: The effects on co-teachers' planning and instruction. *Teacher Education and Special Education,* 37(3), 191-215. https://doi.org/10.1177/0888406414525049

Regan, K., & Weiss, M. P. (2020). Bug-in-ear coaching for teacher candidates: What, why, and how to get started. *Intervention in School and Clinic,* 55(3), 178-184. https://doi.org/10.1177/1053451219842218

Rock, M. L., Gregg, M., Gable, R. A., Zigmond, N., Blanks, B., Howard, P., & Bullock, L. (2012). Time after time online: An extended study of virtual coaching during distant clinical practice. *Journal of Technology and Teacher Education*, 20(3), 277-304. https://www.learntechlib.org/primary/p/38623/

Rock, M. L., Gregg, M., Thead, B. K., Acker, S. E., Gable, R. A., & Zigmond, N. P. (2009). Can you hear me now? Evaluation of an online wireless technology to provide real-time feedback to special education teachers-in-training. *Teacher Education and Special Education,* 32(1), 64-82. https://doi.org/10.1177/0888406408330872

Rock, M. L., Schumacker, R. E., Gregg, M., Howard, P. W., Gable, R. A., & Zigmond, N. (2014). How are they now? Longer term effects of eCoaching through online bug-in-ear technology. *Teacher Education and Special Education*, 27(2), 161-181. https://doi.org/10.1177/0888406414525048

Rock, M. L., Smith, S., Thomas, C., Regan, K., Vasquez, E., Kennedy, M., Dieker, L., Evmenova, A., Okolo, C., & Bausch, M. (2017). CEC TED TAM commentary: A response to an interview with Joseph Smith, Director, U.S. Office of Educational Technology, regarding 21st century special education teacher preparation, *Contemporary Issues in Technology and Teacher Education,* 17(3), 301-311.

Rock, M. L., Spooner, F., Nagro, S., Vasquez, E., Dunn, C., Leko, M., Luckner, J., Bausch, M., Donehower, C., & Jones, J. L. (2016). 21st century change drivers: Considerations for constructing transformative models of special education teacher development. *Teacher Education and Special Education,* 39(2), 98-120. https://doi.org/10.1177/0888406416640634

Rock, M. L. (2019). *The eCoaching continuum for educators: Using technology to enrich professional development and improve student outcomes.* Association for Supervision and Curriculum Development.

Rock, M. L., Zigmond, N. P., Gregg, M., & Gable, R. A. (2011). The power of virtual coaching. *Educational Leadership,* 69(2), 42-47. https://www.learntechlib.org/p/111196/

Rosenberg, N. E., Artman-Meeker, K., Kelly, E., & Yang, X. (2020). The effects of a bug-in-ear coaching package on implementation of incidental teaching by paraprofessionals in a K-12 school. *Journal of Behavioral Education,* 29(3), 409-432. https://doi.org/10.1007/s10864-020-09379-1

Scheeler, M. C., (2008). Generalizing effective teaching skills: The missing link in teacher preparation. *Journal of Behavioral Education,* 17(2), 145-159. https://doi.org/10.1007/s10864-007-9051-0

Scheeler, M. C., & Lee, D. L., (2002). Using technology to deliver immediate corrective feedback to preservice teachers. *Journal of Behavioral Education,* 11(4), 231-241. https://doi.org/10.1023/A:1021158805714

Scheeler, M. C., McAfee, J. K., Ruhl, K. L., & Lee, D. L. (2006). Effects of corrective feedback delivered via wireless technology on preservice teacher performance and student behavior. *Teacher and Special Education,* 29(1), 12-2. https://doi.org/10.1177/088840640602900103

Scheeler, M. C., Morano, S., & Lee, D. L. (2018). Effects of immediate feedback using bug-in-ear with paraeducators working with students with autism. *Teacher Education and Special Education,* 41(1), 24-38. https://doi.org/10.1177/0888406416666645

Scheeler, M. C., Ruhl, K. L., & McAfee, J. K. (2004). Providing performance feedback to teachers: A review. *Teacher Education and Special Education,* 27(4), 396-407. https://doi.org/10.1177/088840640402700407

Sinclair, A. C., Gesel, S. A., LeJeune, L. M., & Lemons, C. J. (2020). A review of the evidence for real-time performance feedback to improve instructional practice. *The Journal of Special Education,* 54(2), 90-100. https://doi.org/10.1177/0022466919878470

Solomon, B. G., Klein, S. A., & Politylo, B. C. (2012). The effect of performance feedback on teachers' treatment integrity: A meta-analysis of the single-case literature. *School Psychology Review*, 41(2), 160-175. https://doi/org/10.1080/02796015.2012.12087518

Unites States Government Accountability Office (2018). *K-12 education: Discipline disparities for black students, boys, and students with disabilities*. https://www.gao.gov/assets/gao-18-258.pdf

Wake, D., Dailey, D., Cotabish, A. & Benson, T. (2017). The Effects of Virtual Coaching on Teacher Candidates' Perceptions and Concerns Regarding On-Demand Corrective Feedback. *Journal of Technology and Teacher Education,* 25(3), 327-357. Waynesville, NC USA: Society for Information Technology & Teacher Education. https://www.learntechlib.org/primary/p/173825/.

Will, M. (2020, June 3). Teachers say they're more likely to leave the classroom because of coronavirus. *Education Week.* https://www.edweek.org/teaching-learning/teachers-say-theyre-more-likely-to-leave-the-classroom-because-of-coronavirus/2020/06

Willems. J. (2019). Digital equity: Considering the needs of staff as a social justice issue. *Australian Journal of Educational Technology,* 35(6), 150–160. https://doi.org/10.14742/ajet.5503

Zeng, S., Pereira, B., Larson, A., Corr, C. P., O'Grady, C., & Stone-MacDonald, A. (2021). Preschool suspension and expulsion for young children with disabilities. *Exceptional Children,* 87(2), 199-216. https://doi.org/10.1177/0014402920949832