Technology-Enhanced Performance-Based Feedback in Teacher Preparation

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Abstract

Quality supervision of teacher candidates during field placements can be a challenge for many university supervisors, particularly given time required for travel, locating an appropriate setting, and identifying effective ways to support teacher candidates in their implementation of evidence-based practices. One effective way to support teacher candidates in their use of evidence-based practices is technology-enhanced performance-based feedback. University supervisors have a range of knowledge and experience in implementing performance-based feedback and using technology to deliver feedback. The purpose of this article is to describe how university supervisors can deliver technology-enhanced performance-based feedback to support teacher candidates' use of evidence-based practices within authentic education environments. Specifically, we identify different modes of technology, which university supervisors can use to deliver performance-based feedback (e.g., email, text messaging, bug-in-ear, and video-based feedback). Additionally, we include logistical and practical suggestions for university supervisors to consider when implementing technology-enhanced performance-based feedback to support teacher candidates during field placements.

Keywords: technology, performance-based feedback, teacher preparation

Kristie is currently in a teacher preparation program that prepares teacher candidates to work with children with and without disabilities. She is enrolled in her first class that includes a field placement, SPED 318: Positive Behavior Support for Diverse Learners. Kristie is feeling concerned because she is not yet sure what to expect or what her role is within her field placement. Her teacher educator, Dr. Herlada, knows that Kristie is likely feeling a little uncomfortable as she has entered the preparation program with little experience in classroom settings. Dr. Herlada wants to be sure that Kristie has a clear understanding of her role in the

field placement, she learns about evidence-based practices, and that Kristie is provided with opportunities to practice the specific evidence-based practices she is learning about in the course. Dr. Herlada would like to provide Kristie with feedback that is specific to the evidence-based practices they are discussing in SPED 318. Therefore, Dr. Herlada knows it will be important to have multiple opportunities to observe Kristie and provide her with feedback. Although Dr. Herlada understands the importance of field placements, practice opportunities, and feedback, Dr. Herlada is not yet sure how she can do this given all of the demands on her time.

Connecting Research to Practice

Quality teacher preparation requires creating intentional opportunities for teacher candidates to learn and use evidence-based practices (Brownell, Ross, Colon, & McCallum, 2005; Kennedy et al., 2016; Nagro & deBettencourt, 2017). Field placements create opportunities for teacher candidates to use the evidence-based practices they are learning about within their coursework so that they can develop both their knowledge and skills (Scott, Gentry, & Phillips, 2014). Although field placements are a critical component of teacher candidate preparation (Macy, Squires, & Barton, 2009), identifying a supervising teacher who has the time to mentor a teacher candidate, and finding a placement where the specific evidence-based practices and course objectives are modeled can be a challenge resulting in a disconnect between coursework and the field placement (Billingsley & Scheuermann, 2014; Ostrosky, Mouzourou, Danner, & Zaghlawan, 2012; Scott et al., 2014). In addition, limited resources including time, scheduling, and funding create challenges in providing adequate field placement supervision (Scheeler, McKinnon, & Stout, 2012). Therefore, quality supervision that cultivates connectivity

between coursework and the field placement is necessary (Kennedy et al., 2016; Leko & Brownell, 2011).

Currently, there is not a recommended supervision model across teacher preparation programs; however, performance-based feedback has evidence of being both feasible and effective in supporting teacher candidates to use evidence-based practices (Barton, Fuller, & Schnitz, 2016; Barton & Wolery, 2007; Brock & Carter, 2017; Coogle, Ottley, Rahn, & Storie, 2018; Coogle, Rahn, & Ottley, 2015; Fallon, Collier-Meek, Maggin, Sanetti, & Johnson, 2015). Performance-based feedback has been used to support both general and special educators and for students ranging in age from preschool to high school (Solomon, Klein, & Politylo, 2012). Performance-based feedback has focused on making recommendations for teacher educators in-practice improvements and the correct implementation of instructional strategies (Powell & Diamond, 2013; Solomon et al., 2012).

Performance-based feedback includes providing information within an authentic setting regarding the use of specified practices (Powell & Diamond, 2013; Snyder, Hemmeter, & Fox, 2015) with a focus on meeting targeted objectives, student performance during implementation and the status in meeting/exceeding targeted objectives (Cornelius & Nagro, 2014). During the process of providing performance-based feedback, a supervising teacher and teacher candidate discuss what went well, potential changes in student outcomes, and any challenges the teacher candidate may have experienced (Fallon et al., 2015). Performance-based feedback can include suggestive and affirmative feedback (Scheeler, Ruhl, & McAfee, 2004). The university supervisor provides suggestive feedback when they give suggestions regarding how the teacher candidate might use a target practice (e.g., “Provide wait time”), and the university supervisor provides affirmative feedback when they praise the teacher candidate for using a target practice

(e.g., “Nice job using wait time”). Further, the teacher candidate has the opportunity to ask any questions he/she may have in order to deepen his/her understanding of how to effectively implement an intervention or strategy (Sanetti, Fallon, & Collier-Meek, 2011).

Performance-based feedback can take many forms (e.g., verbal, written, or graphical) (Barton, Kinder, Casey, & Artman, 2011; Casey & McWilliam, 2011; Sanetti et al., 2011); however, current research does not exist to suggest one form of delivery is more effective than another. Performance-based feedback may be immediate or delayed. The use of immediate feedback occurs within seconds or minutes of an event (Scheeler et al., 2012), while delayed feedback occurs at any time after the event occurs (Barton et al., 2016; McLeod, Kim, & Resua, 2019). Immediate feedback is more effective than delayed feedback as teacher candidates can make connections about the effectiveness of their instructional practices as they occur. These connections result in decreasing the likelihood of continued use of incorrect teaching practices and an increase in the use of positive, correct instructional strategies (Scheeler et al., 2004; Scheeler, Macluckie, & Albright, 2010).

Performance-based feedback can be delivered face-to-face (Friedman & Woods, 2015; Hsieh, Hemmeter, McCollum, & Ostrosky, 2009; Snyder et al., 2015) or using technology-enhanced methods (Barton et al., 2016; Barton & Wolery, 2007; Coogle et al., 2018; Coogle et al., 2015; Scheeler, Morano, & Lee, 2018). The use of technology-enhanced methods may decrease challenges associated with limited resources while enhancing connectivity between coursework and the field placement. Therefore, the purpose of this article is to describe how technology-enhanced performance-based feedback can be delivered to support teacher candidates to use evidence-based practices within authentic education environments.

Delivery of Technology-Enhanced Performance-Based Feedback

Technology-enhanced, performance-based feedback can eliminate some of the challenges associated with quality supervision. The use of technology may be advantageous in decreasing the time required for on-site supervision, making scheduling more feasible, decreasing costs associated with mileage reimbursement for faculty supervisors, and/or decreasing distractions within a classroom setting (Ottley, Coogle, & Rahn, 2015; Scheeler et al., 2012). Technology-enhanced performance-based feedback can include a form of technology to deliver feedback (e.g., email) or a combination of technology systems (e.g., email, text messaging). These forms of technology-enhanced performance-based feedback can range in immediacy and intensity. For example, some feedback (e.g., bug-in-ear) can be provided in real-time, while other forms of feedback may be delayed (e.g., email, text messaging).

Email. Email feedback in educational settings has resulted in teacher candidates increasing practices such as descriptive praise, providing choices, emotion labeling, language expansions, promoting social interactions, and directives (Barton et al., 2016; Barton & Wolery, 2007; McLeod et al., 2019). Email feedback has traditionally included face-to-face observations from an observation area paired with performance-based feedback delivered via email on the same day regarding target practices. Feedback has included an opening statement (e.g., greeting paired with a positive statement, [“Good afternoon, I saw some great examples of emotion labeling today.”]), frequency counts of target practices, (e.g., number of target practices used, [“I observed three instances of emotion labeling.”]), examples of teacher candidate’s use of target practices, (e.g., use of expansions [“I noticed you expanded Rachel’s language during art center. When she said, “I want paper,” you expanded her language by saying “I want the blue paper.”]), a closing statement (e.g., next steps, [“I look forward to our observation tomorrow”]), and a request for a response to ensure the teacher candidate reviewed the feedback, (e.g., seeks

clarification ["Please let me know if you would like more information about how often to use the target practices."]).

Text messaging. Text messaging has been used to support teacher candidate's use of target practices such as facilitating language development and promoting positive social-emotional development (Barton, Rigor, Pokorski, Velez, & Domingo, 2018). Text messaging feedback has involved a supervisor being on site in the classroom, recording targeted teacher behaviors (e.g., choices, language expansions, descriptive praise), and sending a text message with feedback on use of the targeted behaviors to the teacher candidate after completing the observation. Recent research (Barton et al., 2018) suggested the use of six steps in providing text messaging feedback: (a) a positive opening statement, (b) a frequency count of target behavior(s), (c) one verbatim example of her use of the target behavior, (d) feedback related to the target behavior, (e) a positive closing statement, and (f) a response request. Examples of how text messaging performance-based feedback may be used are provided in the following sentences. Feedback begins with a positive opening statement (e.g., "I enjoyed seeing how much fun your class had on the playground this morning!"), includes a frequency count of targeted behavior(s), (e.g., "I noted you expanded David's language five times during the observation today!"), a verbatim example of how the teacher candidate used the targeted behavior(s) (e.g., "For example, you said "in car" to expand his request for you to assist him in getting in the car by saying "car"), feedback related to the target behavior(s) (e.g., "You can expand his language by adding 1-2 words to his utterances such as 'go car,' 'blue car,' or 'all done car'."), a positive closing statement (e.g., "Keep up the good work in responding to David's language through your use of expansions."), and a response request (e.g., "Is 10 a.m. a good time for our next observation?"). The text is sent after checking the data collection sheets regarding teacher

practices. In addition, a reminder text can be sent prior to the observation (e.g., "I look forward to the next observation on Tuesday at 10 a.m.") to remind the teacher candidate which target behavior(s) will be observed (e.g., "During our next observation we will observe use of providing choices with David.").

Bug-in-Ear. Bug-in-ear feedback has enhanced teacher candidates' use of evidence-based practices such as three-term contingency trials, reading practices, and naturalistic instruction in early childhood settings (Coogle, et al., 2018; Coogle et al., 2015; Randolph, Duffy, Brady, Wilson, & Scheeler, 2019; Rock et al., 2012; Rock et al., 2009; Scheeler, McAfee, Ruhl, & Lee, 2006; Scheeler et al., 2018). Bug-in-ear feedback is effective in promoting immediate changes in a teacher candidate's use of evidence-based practices due to feedback received while engaging in instruction or interaction with a child. As the teacher candidate wears the earpiece, he/she can hear the feedback from a teacher educator while teaching in real-time, continue or make corrections to his/her use of teaching practices in the moment, resulting in increased use of positive teaching behaviors (Scheeler et al., 2018).

Bug-in-ear feedback involves providing teacher candidates with feedback from the same location or an alternate location using a variety of technologies (Hollett, Brock, & Hinton, 2017). When receiving feedback from an alternate location, teacher candidates have used technology such as iPad minis, swivls, iPods, Bluetooth devices, and web conferencing systems to communicate with the individual delivering feedback (Coogle et al., 2018; Ottley et al., 2015; Rock et al., 2012; Rock et al, 2009). When delivering feedback face-to-face, the teacher candidate and individual delivering feedback have used one-way wireless transmitters (same location) (Scheeler et al., 2006; Scheeler et al., 2018). Feedback has included affirmative

statements (e.g., “Nice job using in sight out of reach”) and suggestive feedback (e.g., “Try placing the glue sticks where Toby can see them but cannot reach them.”).

Video-Based Feedback. The use of video feedback has been used to help promote teacher reflection and changes in instructional practices (Nagro & Cornelius, 2013). The use of video analysis involves three steps: (a) a teacher candidate can self-record while teaching, (b) the teacher candidate reviews the recording to reflect and analyze what happened during the teaching, and (c) based upon the reflection and analysis with the support of a teacher educator, the teacher candidate makes adjustments in his/her instruction to facilitate student learning (Kennedy, Alves, & Rodgers, 2015; Nagro & Cornelius, 2013). Video-based feedback may include the use of computers, mobile technology, or other devices (Nagro, deBettencourt, Rosenberg, Carran, & Weiss, 2017).

Video-based feedback has also been provided by teacher educators through the use of video annotated software (Ardley & Johnson, 2019). For example, programs such as Go React (goreact.com), Torsh (http://www.torsh.co/classroom-observation-tools/torsh-talent/), and Edthena (https://www.edthena.com/about.html) are programs that teacher candidates can use to self-record. In this method, teacher candidates share a video recording of him/herself teaching and the teacher educator provides feedback on the video at the point in which a behavior was observed.

Researchers have identified five key principles in using video-based technology to support teacher candidates: (a) the use of expert coaches, (b) making connections between videos and coursework, (c) discussion focused on short clips rather than an entire lesson, (d) the use of real and complex situations to support teacher candidates in problem-solving, and (e) focusing on what happened rather than what should have happened when teaching (Kennedy et al., 2015).

Researchers have noted pros and cons associated with the use of video feedback. As many states use edTPA as part of their certification/licensure process, the use of video feedback may align with activities to support teacher candidates in preparing for student teaching and the submission of edTPA materials (Nagro et al., 2017). In contrast, Kennedy et al. (2015) acknowledged that due to time needed to watch videos of teacher candidates, the use of video-based reflection and feedback activities might be more time consuming for teacher educators.

Although Dr. Herlada is aware that some preparation programs are using technology to support their teacher candidates, her program continues to use a traditional approach in providing supervision. However, she would like to examine effective ways of supervision that are supportive in meeting the needs of teacher candidates, promote growth in their use of evidence-based practices, economical, and time-efficient. Finally, Dr. Herlada wants to ensure both she and the teacher candidates are able to use the technology.

As Dr. Heralda considers possibilities of using email, text messaging, bug-in-ear, or video-based feedback she compiles a list of equipment needed for each (see Table 1). Because she has the capacity to use any of the systems, she communicates with her students to make individualized decisions regarding how they might like to receive feedback and reviews other considerations such as placement of equipment, permission forms, and training needs (see Table 2). The students in the teacher preparation program are very comfortable with technology, and they decide as a cohort on one system that they will use to receive feedback in Dr. Heralda's SPED 318 course. They also make decisions regarding a feedback schedule. The field placement schedules, as well as Dr. Heralda's schedule, are considerations they must make, but Dr. Heralda and the students find that when using technology, it is much more manageable to develop an agreed upon schedule.

Table 1

Technology-Enhanced Performance-Based Feedback Systems

	Procedures	Materials	References about Technology-Enhanced Performance-Based Feedback
Email	Observation Send email Confirm receipt of email	Teacher candidate email account Field placement supervisor email account Internet access when sending the email	Barton, Fuller, & Schnitz (2016) McLeod, Kim, & Resua (2019)
Bug-in-ear	Observation Feedback provided in real time	Bluetooth ear piece iPad, Smartphone (if feedback is provided from another location) Video conferencing system (if feedback is provided from another location) Internet access in both classroom and alternate location (if feedback is provided from another location) *Optional: Swivl*	Coogle, Rahn, & Ottley (2015) Coogle, Ottley, Rahn, & Storie (2018) Ottley & Hanline (2014)
Text Messaging	Observation Text message sent Confirm receipt of text message Reminder text message	Phone Text messaging data (teacher candidate and field placement supervisor)	Barton, Rigor, Pokorski, Velez, & Domingo (2018)
Video-Based Feedback	Video-record teacher candidate while teaching Teacher candidate reviews video-	Computer Mobile technology Ipad or other technology	Ardley & Johnson (2019) Nagro, deBettencourt, Rosenberg, Carran, & Weiss (2017)

	recording, reflects, and analyzes what happened during teaching With support from the teacher educator, the teacher candidate adjusts use of instructional strategies with students	Video-based feedback software subscription

Table 2

Considerations in Selecting a Technology-Enhanced Performance-Based Feedback System

Considerations	Where to place technology in the classroom
	If teacher candidate and university supervisor have previously used the equipment
	Training needs in using equipment
	Permission forms signed by caregivers of children in classroom
	Obtaining approval for use of technology by university/school systems/childcare programs
	Potential distractibility in using technology for both the teacher candidates and children in classroom
	Student interest in using technology
	Cost of technology
Resources available	Bluetooth devices, earbuds, iPad minis, swivls, web conferencing systems, cell phones, computers, mobile technology
	Data plan/usage of technology
Internet access	Does the school system/childcare program have wi-fi?
	Will cell phone reception be clear throughout the school and classroom?

Conclusion

It is critical that teacher candidates within teacher preparation programs are enhancing both their knowledge and application of evidence-based practices. Field placements are an important element of teacher preparation; however, teacher candidates must receive quality feedback regarding their use of target practices. Performance-based feedback has demonstrated

effectiveness in increasing teacher candidate's use of target evidence-based practices (Barton et al., 2016; Brock & Carter, 2017). One method in providing performance-based feedback that can decrease challenges to quality supervision is technology-enhanced performance-based feedback. Technology-enhanced performance-based feedback can include a variety of technologies, and can increase the feasibility and quality of performance-based feedback. Research comparing the effectiveness of different types of technology-enhanced performance-based feedback has not yet been conducted and could provide useful information for teacher educators in making informed decisions about how to best support their teacher candidates.

As teacher educators examine the possibility of implementing technology-enhanced performance-based feedback, considerations must be made regarding costs, comfort level in terms of implementation by both the teacher candidate and teacher educator, the technological support at the university level and capacities of different educational programs for internet/Wi-Fi access. Further, although this manuscript provides an overview of different types of technology to consider when providing performance-based feedback, teacher educators may find training opportunities on the implementation of different supports, as well as a more in-depth review of the articles discussed in this manuscript to be helpful. Finally, it may be beneficial for a teacher educator to practice the implementation of technology-enhance performance-based feedback with a small number of students to develop a protocol and method that works best at his/her institution.

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