

# **Technology-Based Model to Support and Enhance Field Experience in Special Education Training Programs in Israel**

**Shiri Ayvazo**  
**David Yellin Academic College**  
**Kinneret Academic College**

**Hagit Inbar-Furst**  
**David Yellin Academic College**

**Hedda Meadan**  
**University of Illinois Urbana-Champaign**

*Education initiatives emphasize the need to use evidence-based practices (EBPs) in general and special education classrooms. To ensure effective teaching it is essential that teachers gain knowledge of EBPs and implement these practices with fidelity. Ongoing changes in teacher training programs (TTPs) such as the reduction in field experience hours and the impact of COVID-19 require exploring new models to support and supplement preservice learning of EBPs. This paper discusses how technologies such as online training modules and coaching can support the training of preservice teachers, and specifically looking, as an example, at the practices in the state of Israel.*

*Keywords: evidence-based practices, online training, adult learning theory, technology, special education teacher training*

## **INTRODUCTION**

The preparation of prospective teachers to serve students with special need is an important mission in the educational field. Students with special needs require highly effective instruction to promote their development and fulfill their potential (Cook et al., 2015). Three prominent assertions underpin this paper. First, the role special education teachers play in the education of students with special needs is critical. Second, selecting and implementing instructional practices based on scientific evidence are essential for students with special needs (Odom et al., 2010; Schles & Robertson, 2017). Third, preservice special education teachers should receive high-quality training and field experience to prepare them for the critical and complex role of serving students with special needs (Schles & Robertson, 2017). The purpose of this paper is to offer an innovative technology-based model to support and enhance field experience in special education teacher training programs (TTPs). The application of the innovative model will refer to TTPs in Israel, as an exemplar. The model may be extended to any country that carries similar characteristics in terms of trends in special education and forms of preparing special education teachers.

In Israel, there has been noted a 70% increase in the number of students with special needs since 2005 and an accompanying rise in the special education budget per academic year (Wiseblai, 2019). In 2015-2017, 10,647 elementary special education teachers (Central Bureau of Statistics, 2018) provided educational services to more than 260,000 students with special needs in Israel, ages 3 to 21 (Wiseblai, 2019). Similar rising trends are internationally noted in other countries such as Australia (Garrad et al., 2019) and India (Singal, 2019) and data reports of the organization for Economic Co-operation and Development (OECD; LeRoy et al., 2019). In countries that experience increasing numbers of students with special needs, effective teaching methods and interventions are particularly imperative. A globally rising educational policy demand is for teachers and school systems to utilize evidence-based practices (EBP; Cook et al., 2015; Odom et al., 2010). The goal of the emphasis on EBPs is to address the contemporary practice by which teachers are not using the most current methods of teaching that have strong scientific support for their efficacy with students with special needs (Cook & Cook, 2011; Odom et al., 2010; Schles & Robertson, 2017). In some cases, teachers use practices that have negative effects on students' outcomes (Cook & Cook, 2011; Schles & Robertson, 2017).

The Institute of Education Sciences and other organizations such as the Council for Exceptional Children (CEC) have undertaken the mission to summarize the scientific findings for educational practices and to describe the level of evidence required to establish a practice as evidence-based. These entities provide educators and policymakers a trusted scientific source of valid practices in education (Odom et al., 2010; Wong et al., 2015). For example, the CEC's standards include 28 quality indicators (applied to different research designs) in the areas of context and setting, participants, intervention agents, description of practice, implementation fidelity, internal validity, outcome measures, and data analysis (Cook et al., 2015). Based on these quality indicators, a body of research is classified into EBP, potentially evidence-based, and other additional classifications indicating mixed, insufficient, or even negative effects (Cook et al., 2015).

A specific source for EBPs in special education can be found in a literature review by Wong et al. (2015) who have tracked intervention practices for children with autism via a rigorous analytic procedure. For the studies to qualify for consideration in the review, the interventions had to be educational, behavioral, or developmental in nature, feasible for implementation in educational, home, or community settings, and ones that include empirically measured academic, behavioral, or developmental outcomes. Practices were considered evidence based if they met at least one of the following evidentiary criteria: (a) two high-quality experimental or quasiexperimental designs by different researchers or (b) five high-quality single-case research studies with more than 20 participants in total and conducted by different researchers, or a combination of the above two criteria (i.e., one experimental design and three single-case studies). The EBP interventions identified included applied behavior analytic techniques, assessment techniques as the basis for intervention (e.g., task analysis), and a combination of behavioral practices used routinely and systematically (Wong et al., 2015).

## TRAINING AND COACHING IN ADULT LEARNING

Competent and effective teachers use EBPs to support their students' academic and social-behavior development and outcomes. Professional development methods are essential to prepare teachers to understand the theoretical foundations of EBPs and the steps required to apply new knowledge and skills to real-life situations (Fixsen et al., 2005; Joyce & Showers, 2002). These methods usually include training and coaching. Although many consider these terms interchangeable, they can be distinguished as different methods.

*Training* is defined as “a learning experience, or series of experiences, specific to an area of inquiry and related set of skills or dispositions.” In training, a professional who has knowledge and skills in the subject matter provides information, gives examples, and delivers direct teaching (National Association for the Education of Young Children [NAEYC] & National Association of Child Care Resource and Referral Agencies [NACCRRA], 2011, p. 7). *Coaching* is “a relationship-based process led by an expert” to develop specific skills and practices through “various combinations of questioning, listening, observation,

reflection, feedback, prompting, modeling, and practice” (NAEYC & NACCRRA, 2011, p. 11). Coaching in TTPs involves individualized support from an expert mentor that is directly tied to the teacher's classroom, students, and teaching practices (Israel et al., 2012).

Researchers report that using both training and coaching is important and beneficial (Meadan et al., 2017). For example, Joyce and Showers (2002) analyzed research on teacher training in public schools and identified four key components for effective professional development: (a) theory and discussion, (b) demonstration in training, (c) practice and feedback in training, and (d) coaching in natural settings. Joyce and Showers conducted a meta-analysis of the effects of training and coaching on teachers' application and found that training with only theory and discussion led to a modest gain in knowledge and demonstration of new skills, but there was very limited generalization to the classroom. Some gains were found when demonstration, practice, and feedback were also included; however, the target skills were still rarely used in the classroom. When coaching was added to training, large gains were observed in both knowledge and use of the new skills in the classroom.

The effectiveness of training and coaching strategies is largely attributed to their connection to principles of adult learning. Trivette and colleagues (2009) conducted a meta-analysis of adult learning strategies associated with positive learner outcomes. They reviewed 79 studies of four adult-learning methods and focused on six characteristics of adult learning: (a) introduce, presenting new material, knowledge, or practices; (b) illustrate, demonstrating the use of the material, knowledge, or skill; (c) practice, engaging the adult in the use of the material, knowledge, or practice; (d) evaluate, having the adult evaluate the outcomes of the application; (e) reflection, having the adult reflect on the learning experience; and (f) mastery, engaging the adult in self-assessment of the acquisition of knowledge and skills.

Trivette and colleagues (2009) concluded that all six adult-learning characteristics are important and associated with positive learner outcomes and that the more adult-learning characteristics that are included when teaching adults new skills, the more likely positive outcomes will occur. Training provides the adult with an introduction to the skill, and coaching provides the adult with practice, reflection, and feedback.

## **SPECIAL EDUCATION TEACHER TRAINING PROGRAMS IN ISRAEL**

Special education TTPs in Israel are housed in universities and teaching colleges. In a university program, the candidate acquires a bachelor's degree in disciplinary studies (i.e., BA or BSc majors that are other than education) and then enrolls in a TTP. In a teaching college, the candidate enrolls in both disciplinary studies and a teacher training certification program simultaneously (i.e., BEd; Lidor et al., 2015). Lately, a third route called an alternative certification program emerged to address the teacher shortage in schools and to increase the quality of professionals who turn to teaching. The alternative route recruits retired high-tech professionals who specialize in mathematics, language, engineering, technology, and science, and prepares them for teaching in a fast-track (Feigin et al., 2017), providing less on-campus method coursework and field experience than traditional programs (Schles & Robertson, 2017). The special education teacher certificate is completed separately from the elementary or secondary general education certificate (Crispel & Kasperski, 2019). Approximately 10,000 teachers graduate each year with a teaching certificate; 20% of them are special education teachers, which illustrates that the special education teaching certificate is a relatively small sector of TTPs (Central Bureau of Statistics, 2018).

In the last 2 decades, all college TTPs have been undergoing a process of academization (Hofman & Niederland, 2010), increasing the emphasis on content knowledge and decreasing the focus on pedagogy (Schles & Robertson, 2017). The process in Israel has been spearheaded by reforms of the Dovrat Committee on behalf of the Ministry of Education and the Ariav Committee on behalf of the Council for Higher Education who called for incorporating formal and high standards of academic studies in disciplinary, education, and pedagogical domains (Feigin et al., 2017; Lidor et al., 2015). More time and courses in the curriculum are allotted for subject matter knowledge acquisition and less time is allotted for field experience. Because the majority of teachers in Israel graduate from teaching colleges, the information discussed in this paper pertains specifically to programs in teaching colleges.

In most special education programs, the TTP includes 90-96 yearly hours that are spread across 3-4 academic years. A range of 50-60 hours is allocated to disciplinary studies (i.e., content knowledge), while only 30-36 yearly hours are devoted to teaching and on-campus method coursework (e.g., methods of teaching math or language) and field experience in educational settings (Feigin et al., 2017; Lidor et al., 2015). The number of required hours in alternative certification programs is lower than the required hours in traditional TTPs (Feigin et al., 2017). Field experience is conducted in inclusive or segregated special education settings with children with diverse special needs. The field experience progresses from one-on-one teaching to small-group teaching to student teaching. It also includes additional experiences such as observing cooperative teachers and aiding homeroom teachers as needed.

Pedagogical coaching, which includes both training and supervision of field experience, is typically conducted by an expert teacher who receives professional development in teacher education and adult learning principles. The expert teacher in this role in Israel is known as a pedagogical instructor. In the teacher education literature, this role is frequently referred to as supervisor. Because the pedagogical instructor in Israel provides both training (e.g., teaching on-campus method coursework) and coaching (e.g., supporting field experience), we will use the term *pedagogical coach*. The pedagogical coach usually oversees 12-18 preservice teachers in field experiences and in on-campus method coursework. The pedagogical coach is responsible for (a) sharing information and content with preservice teachers in the methods courses, (b) providing feedback on preservice teachers' lesson plans, (c) observing preservice teachers in field experience, and (d) promoting preservice teachers' reflection and providing supportive and corrective feedback. The pedagogical coach also provides instructional and emotional support to preservice teachers. Instructional support in the form of observation and targeted performance feedback assists preservice teachers in developing professional knowledge and skills and fosters critical reflection (Schales & Robertson, 2017). Emotional support builds preservice teachers' confidence, self-esteem, motivation, and self-reliance (Burns et al., 2016). The model of pedagogical coaching greatly varies across TTPs and ranges from one observation per month per preservice teacher to only a few observations per year. In other words, observations and feedback for field experience can be concerningly sparse.

There are at least two major limitations of special education TTPs in Israel, specifically related to the field experience component. First is a limitation related to the quality of training and coaching in field experience. The approximate 2:1 proportion between the time allotted for disciplinary studies and the time allotted for didactics' training and field experience is a product of the aforementioned committee reforms implemented since 2005. This mandated proportion severely diminished the quality of field experience and the pedagogical coaching provided to preservice teachers (Lidor et al., 2015). Knowing the subject matter very well is insufficient for high-quality teaching and TTPs are struggling in assisting preservice teachers in developing high-quality practices within the boundaries of the reduced curriculum and the limited pedagogical coaching. In general, teachers report that they are unprepared to deal with the complexity and challenges of the education system (Burns et al., 2016; Feigin et al., 2017), particularly in the areas of classroom management and differentiated instruction. The current field experiences model for preservice teachers does not prepare them well enough to meet the needs of all students, from those who have special academic and behavioral needs to those who are gifted (Burns et al., 2016).

The second limitation pertains to the quality of support provided to preservice teachers within the field experience component. When pedagogical coaches are overworked and/or are assigned to oversee and support a large group of preservice teachers, coaching support is most likely thin in terms of the number of observations and could have direct implications on the fidelity of implementing EBPs and on the effectiveness of improving outcomes for students with special needs (Schles & Robertson, 2017). A well-structured field experience can promote preservice teachers' ability to support students' academic, emotional-behavioral, and social needs (Burns et al., 2016). For example, Clunies-Ross and colleagues (2008) found that consistent feedback helped preservice teachers to reduce students' behavior problems and increase their on-task behavior, appropriate behavior, engagement, and involvement in classroom activities. Arviv-Elyashiv and colleagues (2018) found that novice teachers who reflected on their field experience as preservice teachers indicated that frequent and sensitive guidance from a pedagogical coach accompanied with high standards and good interpersonal relations turned their field experience into a meaningful,

constructive developmental process. Achieving such outcomes of the field experience process is greatly impeded when field experience is reduced and when pedagogical coaching is limited. The result is a superficial and possibly frustrating experience which could explain some of the criticism of TTPs for not producing highly qualified teachers (Lidor et al., 2015).

High-quality teaching is becoming even more critical in light of the recent amendment to the Israeli special education law (Ministry of Education, 2018) which bestows parents of children with special needs the decision on the types of educational setting for their children. Known as the inclusion reform, this amendment will increase the number of students with special needs included in general education settings. As classrooms become more diverse, and students have a range of academic, emotional-behavioral, and social needs, teachers need to become proficient in high-quality evidence-based teaching for students with diverse abilities and needs (Israel et al., 2012; Schles & Robertson, 2017). Using technology to supplement current practices in special education, TTPs could address the reduced pedagogical coaching and assist in increasing special education preservice teachers' capacity in integrating EBPs within their teaching contexts (Gibson & Musti-Rao, 2016; Israel et al., 2012).

### **Use of Technology in TTPs**

Technological innovations in the last decade have expanded the possibilities for the training and coaching of preservice teachers. The use of technology and online teaching is proliferating and recently has become central to the educational community as the world is combatting the current COVID-19 global pandemic and as some schools and universities are under lockdown. These contemporary invasive changes fortify previous assertions on training and coaching preservice teachers during their field experience for which an in-person classroom visit is no longer a single option (Artman-Meeker et al., 2017). The use of technology in TTPs takes various forms. The next section includes a review of three innovative technology-based methods: online training, remote performance feedback, and community of practice.

#### *Online Training*

Online training is being used in TTPs as an alternative or supplement to traditional teacher training. Computerized training includes online modules that are self-paced and include evidence-based teaching methods. Online training typically involves modules that comprise the following characteristics: audio narration, text, graphics, and video models of teaching skills. Each module is self-paced which means that students can advance according to their personal paces. Each module includes guided practice opportunities, correct responding to advance through the content, and pre- and posttraining assessments (Higbee et al., 2016; Pollard et al., 2014). Research on online training modules showed teachers needed 4.5 hours to improve their teaching fidelity to an average of 88% accuracy. Clinical skills such as providing praise or feedback required 7-17 min of viewing to achieve 85-98% performance accuracy (Pollard et al., 2014). Overall, the body of findings suggests online learning is as effective as on-campus learning, and sometimes even more effective.

Online learning entails several advantages: (a) it includes self-paced learning materials, (b) the strategy is low-cost and time efficient and can thus be distributed to geographically isolated areas, (c) pedagogical coaches do not have to commute long distances as the modules can be taken without their professional presence, and (d) students can watch the modules at their own time and location convenience (Pollard et al., 2014). Online training was recently examined among special education preservice teachers (Pollard et al., 2014). The researchers created four training modules on clinical skills: (a) data collection and program overview, (b) managing antecedents, (c) prompting strategies, and (d) managing consequences. Each module included open-ended practice questions and video models ranging from 10 s to 120 s. According to the findings, participants completed their training in 115 min on average, with each module ranging from 17 to 39 min. The preservice teachers' performance increased from an average of 25% in the baseline phase to an average of 93% after the online training, and their knowledge increased from pre- to posttraining test. The participants also reported the computerized training was favorable (Pollard et al., 2014). A replication study by Higbee and colleagues (2016) provided online training to four undergraduates who were not from

education or psychology majors and found they improved their performance in executing a behavioral teaching method for young children with autism following the online modules training.

In another replication study (Gerencser et al., 2018) online training was utilized to teach six paraprofessionals to conduct discrete trial instruction. The online training included six interactive training modules. Each module included audio narration, texts and graphics, video models, knowledge questions, and interactive activities to practice components of the skills learned. All modules and activities were self-paced. Uniquely in this study, participants received a brief feedback opportunity. Following a correct response, informative positive feedback appeared on the screen. Following an incorrect response, corrective feedback appeared on the screen, and then the module returned to the content slides. Participants were required to review the slides again, redo the activities, and proceed to the next activities based on correct performance. Since skill competencies following the online training in this study were variant, Gerencser et al. emphasized the importance of adding performance feedback to the training.

### *Remote Performance Feedback*

Performance feedback, as part of the coaching process, is provided remotely by a pedagogical coach who observes the preservice teacher's teaching session via video from a different location than where teaching takes place. The feedback is usually based on an action plan and discrete teaching practices (McLeod et al., 2019). Performance feedback is a key practice that can assist preservice teachers in implementing EBPs with high levels of fidelity during their field experiences (Gibson & Mutsi-Rao, 2016; Schles & Robertson, 2017). The feedback usually includes both supportive feedback, indicating positive implementation of practices, and constructive feedback, suggesting opportunities to improve performance (McLeod et al., 2019). There are at least three common modes of remote feedback: (a) remote video feedback, (b) in-vivo feedback, and (c) emailed feedback.

Remote video feedback is provided when a pedagogical coach observes a teaching session unobtrusively, and, following the lesson, meets via video with the preservice teacher to discuss the recent observation (Gerencser et al., 2018; Gibson & Musti-Rao, 2016). Remote feedback is typically 20-30 min long. The feedback is delivered systematically. The pedagogical coach evaluates performance on each item on a list of a set of skills the preservice teacher is to display, using, for instance, a three-point scale such as not demonstrated, infrequently demonstrated, or demonstrated. Corrective feedback or reinforcing feedback is provided based on the evaluation. The remote video feedback session is scheduled after every few teaching sessions (e.g., three) as long as the preservice teacher's performance is below a predetermined competency measure, and until performance improves to meet the criterion (Gerencser et al., 2018).

A more intrusive technique to influence teacher's performance is in-vivo feedback. One method to provide in-vivo feedback via technology is to use bug-in-ear (BIE) technology. In-vivo feedback occurs when a pedagogical coach observes an ongoing teaching session through a video conference application and provides instruction, modeling, and feedback (Gerencser et al., 2018). The feedback is provided immediately when an error is made or when the pedagogical coach wishes to communicate information to the preservice teacher in a timely manner. This feedback is designed to correct a teaching behavior quickly and prevent repeated incorrect responses (Gibson & Musti-Rao, 2016; Israel et al., 2012). A developing research base supports the use of BIE coaching with preservice and new teachers and its impact on their target performance of EBPs and acceptability by the preservice teachers (Artman-Meeker et al., 2017; Israel et al., 2012; McLeod et al., 2019; Rock et al., 2014; Scheeler et al., 2012). For example, Rock et al. provided remote coaching to 14 special education preservice teachers using BIE, Skype, and wireless Bluetooth. Pedagogical coaches observed preservice teachers in educational settings located over 100 miles away. The preservice teachers used laptop computers, webcams, and Bluetooth earpieces. The pedagogical coaches observed the teaching episode via Skype and provided real-time remote feedback. This technology-based procedure showed long-term positive effects on teachers' use of EBPs and on students' engagement as well as positive attitudes toward remote coaching.

Remote feedback can also be conducted via email. Following live or recorded observations, the coach writes systematically structured email feedback which typically includes the following components: a positive opening statement, reminder of action plan goals, quantitative data of targeted practice, supportive

feedback including examples, constructive feedback including examples, request for a response, future goal reminder, and session reminder (Barton et al., 2013; McLeod et al., 2019). One study combined the email feedback with video examples. The video email feedback included video examples (5-30 s) of other teachers performing the targeted skill (McLeod et al., 2019). Emailed feedback can be cost-effective, efficient, and feasible compared to other face-to-face encounters (Baron et al., 2013). A few studies have examined the effects of emailed feedback on targeted teaching behaviors in various educational settings such as early childhood settings, preschool, and elementary school. These studies have demonstrated positive effects on discrete teaching skills such as descriptive praise and emotion labeling (Barton et al., 2013, 2019; McLeod et al., 2019). Nonetheless, email feedback is presumed to be more effective for discrete teaching behaviors teachers already know how to use, and less effective for novel teaching skills. Thus, email feedback can be utilized for refining the implementation of EBPs that no longer require intensive support (Barton et al., 2013).

### *Community of Practice*

Meaningful and effective practices maintain and continue to develop when teachers participate as members in professional learning communities that allow them to learn from one another. Co-learning in a community helps teachers connect and share content, expertise, and activities (Reich et al., 2011; Tsai, 2012). It is a community that allows them to share ideas, victories, and struggles (Strycker, 2012) and develop a sense of belonging and commitment.

An online community of practice (CoP) uses the internet as the primary mechanism for communication between and among its members in flexible and convenient conditions and without concerns of location and time of meeting (Tsai, 2012). CoPs can serve as a mechanism for ongoing support during student teaching, when on-campus classes do not meet weekly or when pedagogical coaching support is limited (Strycker, 2012). Looking ahead, some of the future teachers, depending on the sizes and locations of their schools and the disciplines or grade levels they teach, may have no colleagues to create a useful and fulfilling CoP. Online CoPs create technologically proximal colleagues. Training preservice teachers to engage in CoPs during their teacher training may increase the likelihood they would seek for such opportunities when holding teaching positions (Reich et al., 2011).

One version of creating a CoP is a social network (Facebook-like) where members can create their profile pages, leave messages for one another, post updates and responses, publish blogs, and create a network of friends (Reich et al., 2011). Another form of community is Twitter-like where all information can be read in one space (Strycker, 2012) or smartphone apps such as WhatsApp which are immediately accessible at any moment.

Reich and colleagues (2011) facilitated an online learning community for 22 preservice history teachers using a Ning online social network (<http://ning.com>). Each week, two preservice teachers uploaded summaries of the method's course notes that accompanied their field experience and posted a praxis comment or question. Every other week, each preservice teacher in the class was required to initiate or engage in a discussion thread. The results of this study showed that preservice teachers interacted in a broader array of discussions than in typical classroom communication. The social network group of preservice teachers expanded to also engage in service teachers from around the world, and the use of the online social network fostered meaningful reflective conversations about practice, pedagogy, and philosophy (Reich et al., 2011). Although there is an increasing body of research that supports the use of technology within TTPs in general, and specifically in enhancing field experiences, to date, TTPs in Israel do not fully exploit the advantage of the potential benefits of technology-based activities.

### **Technology-Based Model to Support and Enhance Field Experience in Israel**

Using technologies could allow pedagogical coaches to support more preservice teachers as travel demands are reduced (Israel et al., 2012) and enhance their learning. To address the limitations of the current structure of field experience within special education TTPs in Israel, we describe a model that includes technologies to supplement and enhance current practices in TTPs. As such, the model is neither exhaustive nor is it meant to be prescriptive. The proposed model, which is based on adult learning

principles, includes four technology-based features: (a) online self-paced, self-directed training modules on target EBPs; (b) remote observations via technology (asynchronous and synchronous); (c) technology-based supportive and corrective performance feedback (immediate and delayed); and (d) online CoP. These features do not intend to replace current TTP field experience or on-campus method coursework, albeit to supplement and enhance the ongoing training and coaching of preservice teachers in Israel. Embedding technology-based pedagogical coaching is suggested across all types of teaching experiences preservice teachers engage in during the special education certification program. These experiences include one-on-one teaching of one student with special needs, small-group teaching, whole-class teaching, and student teaching internship. As a reminder, we use the term *pedagogical coaching* to refer to both the training (e.g., theoretical information shared in a methods class) and the coaching (e.g., observation, reflection, and feedback). The proposed model is illustrated in Figure 1. Typical field experience practices are denoted in the upper half of the figure and supplemental technology-based activities are depicted in the bottom half of the figure. As mentioned, we recommend embedding technology-based activities within the current structure of the field experience in TTPs in Israel.

#### *Online Training Modules on Target EBPs*

The goal of the online self-paced, self-directed training modules is to support the learning of information and skills as part of the field experiences within TTPs. The learned information will enhance preservice teachers' knowledge and promote their implementation of EBPs with students with special needs. It is recommended that the online modules be relatively short (10-15 min long), include written information on slides and narrations, and high-quality video examples (10-30 s) of the implementation of the target EBP. The online modules should also include step-by-step instruction for how to implement the EBP. To evaluate if the online modules increase preservice teachers' knowledge of EBPs, assessments of knowledge (e.g., quiz questions) could be completed before and after watching each module (Meadan et al., 2017). At the end of the module, the preservice teachers are directed to practice the skill to mastery based on the step-by-step instruction. This is a simulated practice in a contrived, uninterrupted setting.

#### *Remote Observations*

*Asynchronous* (i.e., recorded) observations can be conducted in two ways: (a) recording of simulated performance where the pedagogical coach observes the simulated performance of EBP after completion of the online training module and (b) recording of performance of the targeted EBP in the natural teaching setting. The preservice teacher will send a digital recording of the implementation of the EBP to the pedagogical coach for feedback and evaluation. The digital recordings can be uploaded to a password-cloud-protected storage and shared with the pedagogical coach. For *synchronous* (i.e., live) remote observation, computer-based video conferencing can be used to allow the pedagogical coach to virtually visit the teaching setting. Videoconferencing free technologies such as Skype, iChat, and Zoom can be used (Israel et al., 2012; Meadan et al., 2013). Utilizing both asynchronous and synchronous observations could allow more frequent observation by the pedagogical coach and, therefore, increase the dosage of support while minimizing the time spent on travelling from site to site.

#### *Technology-Based Performance Feedback*

Performance feedback could be immediate or delayed. *Immediate remote feedback* can be delivered in two ways: (a) oral feedback (i.e., conversation via videoconferencing) that should be provided systematically based on data collection, preferably according to a premade item-list of the targeted EBP; and (b) in-vivo feedback by using BIE technology, which, in turn, eliminates the time following the lesson for reflection and feedback exchange (Schles & Robertson, 2017). It should be noted that BIE interjections should be reduced as the preservice teacher becomes more and more proficient (Israel et al., 2012). Pedagogical coaches can also provide *delayed remote feedback* which does not immediately follow the observation of the teaching session. A pedagogical coach could use the delayed feedback when either they or the preservice teacher is unavailable to meet immediately following the observation for post lesson reflection and feedback. They can schedule a live videoconference feedback meeting at a more convenient



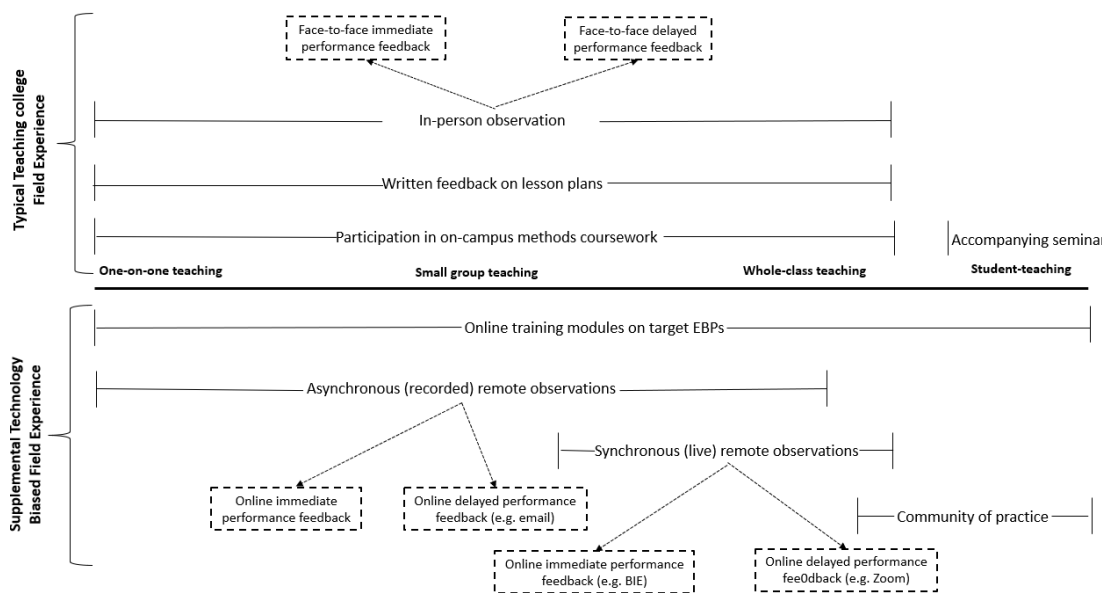
time for both parties, without jeopardizing their ongoing schedule (e.g., another class that begins immediately after the observation). If using e-mail feedback, we suggest using a structured format that could include the following components: greeting, pinpointing of strength within the performance, measurable data, constructive feedback with specific examples and a request from the preservice teacher to respond to the supervisor with setting a future goal based on the current feedback. Preferably, the feedback meeting should be provided on the day of observation.

### Participation in Online CoP

The final component of the proposed model is the participation of preservice teachers, prior to the onset of the student-teaching experience, in a CoP that will provide them with social and emotional support and the opportunity to exchange experiences. The CoP can be tied to the methods coursework and to the seminar that accompanies student teaching and can be housed in the classroom website (e.g., Moodle). Because preservice teachers are inexperienced, the pedagogical coach should direct and monitor engagement in the CoP. The pedagogical coach could direct preservice teachers to share knowledge they have acquired or strategies they have implemented in their experience in the current week and can be useful for the CoP participants, share information related to how they implement EBPs, or share a victory or a struggle they have experienced this week and ask for the input of others.

Figure 1 displays the proposed technology-based model to support field experience. Typical field experience practices are denoted in the upper half and supplemental technology-based activities are depicted in the bottom half of the figure.

**FIGURE 1  
PROPOSED TECHNOLOGY-BASED MODEL TO SUPPORT FIELD EXPERIENCE**



### ETHICAL CONSIDERATIONS

Systematically embedding technological features within TTPs poses ethical considerations that should be addressed. First, the use of technology is subject to the same ethical and legal considerations as on-site observations and training procedures. The preservice teacher, the pedagogical coach, the school students and their guardians, and all parties involved should have a clear understanding of the purpose of the digital content (i.e., digital recordings and notes) and how it will be used (e.g., professional development, coaching,

and research). Signed informed consent should be obtained from all parties. Second, students with special needs are a vulnerable population. Ethical protocol for using videos should be planned and followed carefully. Third, intrusive technological means, such as remote observations or BIE while observing one's lesson may induce feelings of "big brother" watching, increased anxiety, and perhaps paralyzing the preservice teacher's capacity (i.e., "say X, do Y"). To address this concern, pedagogical coaches should carefully attend to building coach-preservice teacher relationships that continuously fosters critical thinking and problem-solving skills. Finally, all identifying details of educational settings, teachers, and students should be handled cautiously and anonymously in any online correspondence (e.g., email feedback and postings within the CoP).

## CONCLUSION

The mission of special education is to provide individualized instruction through the implementation of EBPs. This paper presented the current practices of preparing preservice teachers within field experiences in TTPs in Israel and discussed the limitations in the quality of training, coaching, and support for preservice teachers during field experiences. If TTPs seek to improve the quality of training and coaching and enhance preservice teachers' capacity in implementing EBPs in their teaching contexts, they should explore supplementing their current practices with technology-based activities (Israel et al., 2012; Sinclair et al., 2019). The technology-based methods recommended in this paper are online self-paced, self-directed training modules, on EBPs, remote observations via technology, technology-based supportive and corrective performance feedback, and online CoPs. All methods are in line with and underpinned by conceptions of training and coaching in adult learning. These methods could assist in enhancing and systematizing support for field experience, in manners that are appealing and appropriate for learning in this era. They become notably relevant due to the prospective effects of the COVID-19 pandemic on education and teacher education in terms of teaching via technology-based methods.

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