The Social Validity of Bug-In-Ear Coaching: Findings from Two Studies Implemented in Inclusive Early Childhood Environments

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Abstract

Coaching is a promising method for providing professional development, which takes many forms. One such form is real-time coaching through bug-in-ear technology. This study explored the social validity of bug-in-ear coaching when provided as a form of professional development with pre-service and in-service early childhood educators. Data from two studies were qualitatively analyzed to describe early childhood educators' perceptions of the acceptability of bug-in-ear coaching with respect to the learning opportunities provided, feasibility, difficulties, and child-level outcomes. Findings suggest that BIE is deemed to be important and effective at producing educator and child outcomes. Further, educators are satisfied with the intervention and view it to be an acceptable means for receiving professional development.

Keywords: professional development, personnel preparation, coaching, bug-in-ear, social validity, early childhood education

The Social Validity of Bug-In-Ear Coaching: Findings from Two Studies Implemented in Inclusive Early Childhood Environments

Professional development is essential for supporting early childhood (EC) educators' use of evidence-based practices. Coaching is one promising method for closing the research to practice gap by promoting implementation and sustainability of evidence-based practices in the classroom (Fixsen, Naoom, Blase, Friedman, &Wallace, 2005; Joyce & Showers, 2002). Coaching offers ongoing support rather than one-shot trainings, which are largely ineffective for promoting sustained implementation of practices (Odom, 2009). Fixsen et al. (2005) define coaching as, “teaching and reinforcing evidence-based skill development and adaptations of skills and craft knowledge to fit the personal styles of the practitioners” (p. 47). One important feature of effective coaching is immediate feedback provided in real time (Scheeler, Ruhl, & McAfee, 2004). Real-time coaching offers the opportunity for immediate feedback to be provided to the individual being coached, a practice which increases the effectiveness of the professional development as compared to traditional feedback provided at the conclusion of a coaching session (Scheeler, et al., 2004). Although there is a substantial body of research on real-time coaching (e.g., Scheeler & Lee, 2002; Rock et al., 2009), there is more limited evidence on the social validity, or practical importance and social value, of this practice (Horner et al., 2005; Wolf, 1978) particularly with EC educators. The purpose of this paper was to explore the perceived social validity data from two groups of EC educators teaching in inclusive environments who participated in bug-in-ear (BIE) coaching studies.

Bug-In-Ear Coaching

BIE coaching is a method for providing immediate feedback to educators within the course of teaching (Ottley, in press). BIE methods involve the educator wearing an earbud in one

ear, which allows her to hear feedback from the coach in real time while interacting with children. Existing evidence indicates BIE coaching is effective in increasing specific teaching behaviors in in-service and pre-service educators. For example, Goodman, Brady, Duffy, Scott, and Pollard (2008) used a multiple-baseline, single-case design to examine the effects of BIE coaching on three pre-service special educators' use of complete learn units (i.e., a teaching sequence that includes an antecedent, student behavior, and consequence). All educators increased their use of complete learn units during intervention and two of three maintained these improvements when the intervention was faded. Similar results have been observed with in-service educators. For example, Scheeler, Congdon, and Stansbery (2010) provided immediate feedback on specific teaching behaviors to three co-teaching dyads consisting of one general educator and one special educator. All educators increased the percentage of complete learn units during intervention and maintained percentages during fading, maintenance, and generalization phases.

More recently, researchers have combined BIE coaching with video technology (e.g., Scheeler, McKinnon, & Stout, 2012) to provide immediate feedback from a distance. Coaching from a distance takes place when the coach provides feedback in an alternate location from the individual being coached. This type of coaching is possible through various web-based forms of technology such as video-conferencing software (e.g., Skype™; see Coogle, Rahn, & Ottley, 2015b). Rock and colleagues (2009) used BIE and Skype™ to provide coaching to 15 pre-service educators to enhance their use of specific instructional practices during reading lessons, as well as to improve the classroom climate. For each educator, researchers coded videotapes of one session with and one session without BIE coaching. Matched-pairs *t* tests suggested significant increases in pre-service educators' use of the targeted teaching strategies and

students' engagement during intervention sessions. These studies have demonstrated that BIE coaching from a distance can be an effective method for supporting educators in their classrooms.

Research examining the use of BIE coaching in EC contexts is more limited in scope. For example, programs such as Coaching Approach behavior and Leading by Modeling (CALM; Puliafico, Comer, & Albano, 2012) and Teacher-Child Interaction Therapy (TCIT; Gershenson, Lyon, & Budd, 2010) use BIE coaching to teach parents and educators to use reinforcement strategies to prevent and treat behavior difficulties. Other researchers have used BIE coaching to support EC educators' use of evidence-based communication strategies (Coogle et al., 2015b; Coogle, Ottley, Rahn, & Storie, 2015a). For example, Coogle and colleagues (2015b) examined the use of immediate feedback delivered from a distance via BIE and Skype™ on three EC special education pre-service educators' use of environmental arrangement communication strategies. The results indicated that all three educators increased their use of communication strategies during the intervention phase of research. These and other studies (e.g., Lyon et al., 2009) demonstrate that BIE coaching can be an effective means for improving pre-service and in-service educators' (including EC educators) use of evidence-based practices and is effective when provided in-person or from a distance using video-conferencing technology. Although BIE coaching appears to be effective for increasing a variety of evidence-based practices, in most of these studies researchers have focused on specific teaching behaviors and few have examined child or student outcomes. Additional research is needed in EC settings to examine the effects of BIE coaching on more broad-based implementation of evidence-based practices and resulting changes in child outcomes (Coogle et al., 2015a). In addition, few researchers have examined generalization of newly-learned educator behaviors in other classroom contexts. Social validity

data may be one important source of information in helping researchers identify supports needed by EC educators to promote implementation and generalization of evidence-based practices.

Social Validity

Social validity is defined as the, "practicality, of research procedures and findings" (Horner et al., 2005, p. 172) and has a long history of implementation within the field of applied behavior analysis (Baer, Wolf, & Risley, 1968; Gast, 2010; Kazdin, 1977; Wolf, 1978). Wolf (1978) has argued that researchers must consider the social importance of their work by examining: (a) if the goals of their research are worthwhile to society, (b) if the procedures are acceptable, and (c) if consumers are satisfied with the effects. Thus, one means to ensure that research is of practical value is to examine its social validity (Horner et al., 2005; Wolf, 1978). There are several approaches to measuring social validity including subjective evaluation, normative comparison, and sustainability (Kennedy, 2005), which are described in Table 1.

Social Validity of Bug-In-Ear Coaching

BIE researchers have primarily used a subjective evaluation approach to determine social validity. To obtain social validity data, research teams have asked study participants to either complete surveys with Likert-scale and open-ended questions (Scheeler, Bruno, Grubb, & Seavey, 2009; Scheeler & Lee, 2002; Scheeler, McKinnon, & Stout, 2012) or to provide written reflections in response to question prompts (Rock et al., 2009). These subjective evaluation data are organized based upon educators' report of BIE's effectiveness, acceptability, satisfaction, and importance. Researchers have likely used a subjective evaluation approach because of its feasibility as compared to other approaches to examining social validity. A normative comparison approach requires a comparison group (e.g., educators who did not receive coaching) and a sustainability approach requires longer-term measurement of participant outcomes, making

these methods more time- and resource-intensive. Thus, it is not surprising that the majority of social validity data have been in the form of the subjective evaluation approach.

Pre-service special educators have reported that BIE aided in the acquisition of evidence-based practices during coaching sessions, which led to their spontaneous use of practices when coaching was not provided (Rock et al., 2014). Further, social validity data from three BIE studies indicate BIE coaching is helpful in increasing student performance with school-age students. In one study, educators reported improvements in students' persistence during difficult tasks (Scheeler et al., 2010) and in two studies, observations of students' behaviors indicated improved engagement during lessons (Rock et al., 2009, 2014). However, another of Rock and colleagues' (2012) studies found non-significant effects of BIE on student engagement.

Data on the appropriateness of BIE coaching indicate participants found BIE coaching minimally- or non-disruptive (Rock et al., 2009; Scheeler et al., 2009; Scheeler & Lee, 2002). School-age children have also reported that they were not distracted by their educators receiving BIE coaching (Scheeler, McAfee, Ruhl, & Lee, 2006). In multiple studies, educators have reported difficulty with the BIE technology (Rock et al., 2009, 2014), and one educator in Scheeler and colleagues' (2009) study reported that she grew tired of using the BIE device.

Importantly, educators across studies have reported that they enjoyed receiving BIE coaching and that they appreciated receiving the feedback. Educators in a multi-year BIE study had more positive than negative attitudes toward BIE coaching (Rock et al., 2014). Other educators have reported that they would participate in BIE coaching in the future either as a recipient of coaching or as a coach to others (Scheeler et al., 2009, 2010, 2012). Further, educators in several studies reported an interest in trying BIE coaching with their students or with paraprofessionals in their classroom (Scheeler et al., 2009, 2010).

Far less information is available on the importance of BIE coaching than on the other dimensions of social validity (i.e., effectiveness, acceptability, satisfaction). From the data that are available, educators have reported the importance of receiving feedback that is immediate (Rock et al., 2014), thereby highlighting the significance of this key feature of BIE coaching.

Collectively, social validity data from these studies suggest individuals who participate in BIE studies perceive this method of coaching to be beneficial. These data reflect school-age educators' perspectives about the effectiveness and importance of BIE on their own and students' outcomes (Scheeler et al., 2009, 2010, 2012), as well as educators' opinions about the appropriateness of and their satisfaction with the intervention. In addition, most of these data were collected via questionnaires only (c.f., Rock et al., 2009, 2012, 2014). Unfortunately, little data are available on the efficacy of BIE coaching in EC settings, and consequently the social validity of BIE for EC educators has yet to be determined.

Given the growing body of evidence demonstrating the efficacy of BIE coaching, an important next step is increasing the utility and implementation of this practice with EC educators. To aid in this process, we chose to thoroughly examine the perceived social validity data from two studies with this population to better understand BIE coaching from the perspectives of EC educators. Thus, the purpose of this study was to explore the perceived social validity of BIE coaching in EC contexts. Our central research question was: How do EC educators describe the acceptability of BIE coaching? Sub-questions included: How do EC educators describe the learning opportunities experienced through BIE coaching? How do EC educators perceive the feasibility of the BIE coaching process? What difficulties do EC educators experience with regard to BIE coaching? How do EC educators perceive the usefulness of BIE coaching with respect to young children's communication outcomes?

Method

This research focused on the social validity components of two BIE coaching single-case intervention design studies. The purpose of conducting this study was to explore and describe the perceptions of EC educators receiving BIE coaching to obtain a deeper understanding of the social validity of the intervention. Although the measures of social validity were secondary in nature given the scope of the studies, the researchers used five research-based, purposeful methods recommended by Brantlinger, Jimenez, Klingner, Pugach, and Richardson (2005) to guarantee quality and rigor of data collection and analysis (2005). First, the researchers triangulated data in two ways. Methodological triangulation was implemented through the three methods including: observations, interviews, and document analysis. Then, data were triangulated across data sources (i.e., the participants). Second, the researchers maintained detailed notes and records of the data in order to provide thick descriptions of the EC educators' perceived social validity of BIE coaching. Third, the researchers were sensitive to any potential disconfirming evidence by thoroughly examining data to determine if inconsistencies from the themes emerged. Fourth, the researchers maintained a detailed record of the data (audit trail) to demonstrate evidence of data collection and analysis. Finally, data were analyzed in a meaningful way (i.e., code-recode strategy). Triangulation, using thick descriptions and examining data for disconfirming evidence ensure the data are credible and aid in the transferability of research findings. The audit trail, code-recode strategy, data triangulation, and disconfirming evidence substantiate that the findings are dependable.

Participants

Criterion sampling, a form of purposeful sampling, was used to select the participants in order to obtain a deeper understanding of the social validity of BIE coaching for a specific group

of participants (Patton, 2002), namely EC educators working in inclusive environments who received BIE coaching. Both pre-service and in-service educators were included as participants, because previous research has indicated that BIE coaching has been used to provide performance-based feedback to both of these populations with similar effectiveness (e.g., Scheeler et al., 2010, 2012) and the research team sought to understand the acceptability and satisfaction of BIE from the standpoint of all groups of EC educators receiving BIE coaching. Further, the rationale for including participants from inclusive EC settings was two-fold. First, this is an area that is just beginning to emerge in the field of BIE research, and second, these participants met the criteria of teaching where similar activities were taking place (child-led activities, teacher-led activities, routine activities). Thus, these participants had the potential to provide rich information related to BIE coaching in EC environments. To the best of the researchers' knowledge, the two studies included were the only BIE studies completed with EC educators working in inclusive settings. While the number of participants is small, quality indicators in qualitative research do not specify a necessary number of participants. Rather, factors such as the purposeful recruitment of participants, adequate representation of the population, and saturation are generally used as the guiding principles to determine the number appropriate (Glaser & Strauss, 1967).

Study 1: BIE Coaching with Pre-service EC Special Educators. The second author offered four pre-service educators the opportunity to participate in distance coaching during their internship. Three of the four agreed to participate. The pre-service educator who chose not to participate was a part of a classroom where a large number of children did not receive consent to participate, and she was concerned that it would create challenges in completing her internship, as she only would have been able to interact with one child during data collection. Pre-service

educators were told that the research team wanted to observe how receiving feedback impacted them as a professional. The demographics of the three pre-service EC special educators (Jordan, Shay, Noelle; pseudonyms) were similar to those of their peers in relation to their age, race, ethnicity, higher-education performance and experience working with young children. All educators were non-Hispanic Caucasian, 23-year-old female undergraduate students completing a Bachelor's program in EC Special Education from a large public university in the mid-Atlantic region. Educators had an average of 3 years (range 2-6 years) experience working with children and an average of 14 months (range 5-24 months) experience working with children birth to eight-years-old with disabilities. All of the pre-service educators had received delayed feedback from their university supervisors during their three previous practicum placements, but none of the pre-service educators had received immediate feedback or BIE coaching prior to this study.

Study 2: BIE Coaching with In-service EC Educators. The first author offered five practicing EC educators working in inclusive settings the opportunity to participate in onsite coaching. All five agreed, but prior to the start of the study, one educator quit her job. The four remaining educators (Chante, Brandy, Monique, Lanelle; pseudonyms) were informed that the purpose of the study was to learn how to enhance the development of young children with disabilities or developmental delays. All educators were African-American females who averaged 30 years of age (range 22-42 years). Educators had an average of 6 years (range 2-10 years) of experience working with children birth to five years and they were currently working in an Early Head Start (n = 3) or a public EC center (n = 1) in the Southeast. The highest levels of education completed were a Child Development Credential (n = 1), Associate's degree (n = 2), and Bachelor's degree (n = 1). The educators had never received BIE coaching prior to this study; however, their previous experiences receiving other forms of coaching were unknown.

Intervention

The professional development provided to the pre-service and in-service EC educators aligned with the Division for Early Childhood's recommended practices for teaming and collaboration (2014) and their position statement on cultural and linguistic responsiveness (2010). Specifically, the researchers communicated regularly with EC educators to enhance the trust in their relationships and demonstrate respect for the educators. Additionally, encouragement and performance-based support were provided regularly to promote educators' confidence and capacity to implement the communication strategies.

For Study 1, pre-service educators learned the communication strategies through a narrated PowerPoint presentation that was provided to them after completion of the baseline phase. This form of instruction was similar to the types of instruction received via their university courses. BIE coaching for Study 1 occurred at a distance with the second or third author providing feedback to pre-service educators from an off-school location via Skype™. Coaching sessions were 10 min in length and lasted one week with coaching sessions occurring twice a day for four days.

The intervention for Study 2 included three 15-min face-to-face trainings that focused on one instructional strategy each. BIE coaching occurred for an average of 15 min a day for three to five days per week. The coaching duration was approximately two months in length.

Data Collection

Triangulation of data was conducted by using various methods of data collection in each study as well as including data from multiple participants (Miles & Huberman, 1994; Patton, 2002; see Tables 2 and 3). Data collection in Study 1 included observations, interviews, and document analyses; whereas, Study 2 used observations and document analyses. Interviews and

questionnaires from Study 1 were conducted upon completion of pre-service educators' internship experiences and grade assignments in order to diminish the possibility of pre-service educators providing false-positive responses if it were believed that positive responses could influence their final internship grades.

Observations. Observations were conducted by watching 10-min (Study 1) or 3-min (Study 2) videos of the educators during BIE coaching. Data were collected until saturation was reached with each participant (i.e., until the research questions were answered; Charmaz, 2006; Glaser & Strauss, 1967). Because two university faculty provided feedback for Study 1 (observational data), the researchers watched at least one video from each researcher. Study 2 included three waves of intervention per educator (one for each communication strategy). One video was observed from each wave for all educators.

Interviews. Interviews are frequently used in qualitative research to allow participants the opportunity to elaborate on information related to the research questions (Patton, 2002). Therefore, semi-structured, open-ended interviews were conducted (Study 1). Questions focused on pre-service educators' experiences with BIE coaching. Each educator was provided the questions prior to the interview and were interviewed face-to-face to obtain more direct information and develop clarity on observation notes. Interviews lasted 45 to 60 minutes. The second author transcribed all responses to prepare for analysis.

Document analysis. Document analysis is often used in qualitative research to triangulate data (Patton, 2002). Using the methods for analysis (see data analysis), the researchers coded the open-ended questions from the social validity questionnaire that each educator completed. Document analysis was conducted by reviewing one questionnaire

completed by each educator. Additionally, co-educators from Study 2 completed social validity questionnaires describing their perspectives of the BIE coaching.

Data Analysis

All data were used to answer the research questions. Interviews, observations, and responses to the open-ended questions from the social validity questionnaire were transcribed into Microsoft Excel and were coded and recoded according to the iterations identified in Table 4. The second author coded data into starter codes based on the research questions (Open Coding: Iteration One). The four starter codes were learning, feasibility, challenges, and child outcomes. The first author reviewed a random 33% of the initial analysis to ensure inter-rater reliability (Iteration Two), which was achieved at 95% agreement. Disagreements were discussed until agreement was reached regarding the most suitable code for the data (Iteration Three). Using the starter codes as themes, the first author identified subthemes by using pattern coding (Iteration Four). Subthemes related to each theme are identified in Table 5. These codes were then analyzed for reliability by the first author (Iteration Five) with reliability greater than or equal to 90% for all codes. Last, the first and second authors discussed and recoded any data where disagreements occurred (Iteration Six).

Findings

The findings from this study provide a deeper understanding of how EC educators describe the acceptability of BIE coaching. Findings are organized by the themes and emerging subthemes (see Table 5).

Theme One: EC Educators' Learning Experiences with BIE Coaching

Data from the theme of learning experiences included the two subthemes of mechanisms for providing a learning opportunity (52% of the codes in the theme) and enhanced abilities (48% of the codes). Data from both subthemes were documented from all seven EC educators.

Mechanisms for providing a learning opportunity. Data within mechanisms for providing learning opportunities included the following units of meaning: prompting feedback (*n* = 46), positive feedback (*n* = 50), corrective feedback (*n* = 7), practice applications (*n* = 11), and problem-solving (*n* = 8). Prompting feedback was exhibited when Brandy was prompted to "model bread" during socio-dramatic play, positive feedback was illustrated when coaches provided educators with praise for using strategies effectively, and corrective feedback was illustrated when Jordan was provided the following feedback, "When you offer him a choice this time, name the two bugs so he will use one of the bug names." A practice application was demonstrated when Chante indicated that the immediate feedback "reminded [her] to use the strategy." Problem-solving contextual situations during BIE sessions were documented when educators would ask questions or coaches would provide extra support as a means to clarify the situation. This included coaches providing examples of the strategies, such as suggesting that the educator offer the choice of "burying an animal or a person" during sensory table play.

Enhanced abilities to use strategies, effective teaching practices, and follow feedback. Enhanced abilities was represented through educators' response to prompts (*n* = 10), accurate use of communication strategies (*n* = 41), spontaneous use of strategies (*n* = 45), improved teaching practices (*n* = 9), and confidence (*n* = 8). When coaches would prompt the educators to use a strategy, they would use it effectively. For example, in one of Andrea's observations, she said, "The oven is hot; can you say hot?" Educators were observed

spontaneously performing the strategies without prompting (e.g., Lanelle's use of imitation during a read aloud). Educators also described in interviews and questionnaires their independent use of the strategies when coaching was not occurring. Shay reflected in her questionnaire that she was starting to use the strategies "more naturally, without even thinking about it and in situations such as meal time and outside play."

In addition to improving educators' abilities to use the strategies, educators described enhanced overall teaching abilities. For example, Shay perceived improvements in her lesson planning and Brandy perceived herself as better able to provide accommodations for children with disabilities. Additionally, educators expressed confidence in their abilities to use the communication strategies and meet the communication needs of children with developmental delays and disabilities. Noelle was somewhat confident in her abilities, communicating in her questionnaire, "Once I practice these [strategies] more, I feel I will be more confident."

Theme Two: EC Educators' Perceptions of the Feasibility of BIE Coaching

Three subthemes emerged from the data describing the feasibility of BIE coaching. All EC educators indicated they were able to continue with their typical routines and procedures (77% of the data in this theme). Six of the seven educators expressed appreciation for receiving immediate feedback (13% of data) and five educators commented on the influence of BIE on young children (10%).

Ability to maintain classroom routines and procedures. Data emerged which revealed EC educators receiving BIE coaching were able to maintain their scheduled academic activities (n = 18) and classroom behavioral plan (n = 6). Further, educators continued questioning children (n = 9), maintaining consistent procedures for activities (n = 3), and inviting children to participate in the activities (n = 2). All of these codes were from observation data of the

educators and children during coaching sessions. For instance, while singing songs with the children, Lanelle was able to receive feedback and embed the communication strategies into the activity. The remaining codes in this subtheme (n = 10) were general comments made about the feasibility of BIE coaching. For example, Monique stated, "[BIE] allowed me to get instruction and feedback without disturbing the children during our activities." Additionally, Jordan stated, "I think it worked out a lot better than what I anticipated. It was *a lot less invasive* [emphasis added] than what I imagined."

Appreciation for the immediate feedback. The eight codes in which EC educators demonstrated appreciation for receiving BIE coaching were related to the benefit of receiving immediate feedback. Noelle stated, "from immediate feedback you get to try right then and there what they are suggesting instead of hearing about it later and trying to replay a situation where the feedback can be used." Additionally, a co-educator in Chante's classroom stated that she would be interested in BIE coaching "…for personal improvement, to see the difference it makes with the kids;" a comment appearing to suggest that she observed improvements in the children with whom Chante interacted.

Influence on children. Jordan and Noelle indicated that the children were interested in the iPad and looking into the camera, but that BIE coaching did not affect the children or what they would have typically been doing in the classroom. Observational data supported these findings, with the children in Monique, Lanelle, and Brandy's classrooms engaged in typical play-based routines, without distraction toward the camera or the coach.

Theme Three: EC Educators' Difficulties with BIE Coaching

Data from this theme represent four of the EC educators' perspectives on BIE challenges as communicated through interviews, questionnaires, and observations. Specifically, three

educators experienced challenges with the technology (*n* = 15), multitasking (*n* = 16), and the technology distracting the children (*n* = 7). Additionally, two educators had challenges obtaining child consent (*n* = 9) and keeping-up with data collection (*n* = 2).

Technology challenges. The most common technology difficulty suggested by participants was problems hearing the coach (*n* = 6). Additionally, educators experienced difficulties related to the internet (*n* = 3), such as it not working and sometimes when it was working, Skype™ calls were dropped. Further, during some activities, the iPad camera was unable to capture a full view of the contextual environment (*n* = 3). Finally, Chante voiced through her interview that she both enjoyed and failed to enjoy the BIE coaching. Specifically, she did not enjoy BIE coaching when the Bluetooth™ "echoed at noisy times."

Educators' challenges multitasking. At times, educators indicated having difficulties getting children to participate (*n* = 2) and keeping the pace of a lesson when using wait time (*n* = 1). On one occasion, a coach from Study 1 struggled to provide feedback, because of the type of activity in which the educator and child were engaged. By far, the most challenging aspect of BIE coaching, suggested by the number of codes within this unit of meaning, was related to the challenges associated with leading classroom activities and listening to/embedding feedback simultaneously (*n* = 12). Observation data suggested that during the hectic times in the classroom, the educators appeared to implement some of the coach's feedback suggestions, while ignoring others. This was reiterated in Noelle's questionnaire.

> The challenge is that sometimes the classroom is a little hectic so when you are the lead teacher and trying to listen to what the person is saying to you as well as what is going on in the classroom, it [*sic*] can be difficult at times.

Technology distracting children. According to the participants in Study 1 and Study 2, children in BIE classrooms were interested in, and at times distracted by (*n* = 5), the technology. Behaviors exhibited by children included: looking at themselves in the camera, playing with the iPad, and moving the angle of the iPad. Jordan thought that children with developmental delays or disabilities were less aware of the technology. Further, Chante thought that the children's distractibility and challenging behaviors were more notable at first, but subsided throughout the intervention.

Obtaining familial consent for children to participate. Noelle communicated that the study was somewhat difficult to implement because not all children in the classroom provided consent (*n* = 5). Furthermore, during Noelle's interview, she reported that at times she had to wait to complete the BIE coaching until children with consent were available to participate in the activity, which made the coaching "more stressful."

Scheduling difficulties. Two codes emerged from the data to form the subtheme of scheduling and both codes describe the intensity of the intervention. Shay and Noelle thought that the baseline data collection and BIE coaching occurred at a rate that was difficult to manage.

Theme Four: Educators' Perceptions of the Usefulness of BIE Coaching for Improving Children's Development

A total of 62 codes emerged within the perceived usefulness of BIE coaching for improving children's development. Within this theme, all EC educators identified improved communication (*n* = 40) and engagement (*n* = 19) as child-level outcomes of BIE coaching. Additionally, three educators indicated that children learned "other skills" (*n* = 3).

Children's communicative development. All of the codes representing educators' perceptions of BIE on children's communicative development (*n* = 40) described children's

enhanced verbalizations, as well as the impact of strategies on promoting children's communication. Brandy's co-educator reflected in her questionnaire, "They picked a choice … They either pointed to it, or if they were able, they said it." Furthermore, Chante indicated the impact of expansions when she said it, "gave them more words to use instead of one or two words." These data were supported with observations, such as a child in Monique's class saying, "my rocket is going up [into] space…up, up, up" during a play-based activity as well as a child in Lanelle's class shouting out the number of monkeys left in the bed during a read aloud.

Children's engagement in activities. Educators described children's engagement in the following ways: attending to the lesson (*n* = 3), staying the entire lesson (*n* = 2), waiting their turn (*n* = 1), actively participating (*n* = 3), listening to instruction (*n* = 1), and cleaning up (*n* = 1). For example, children in Monique's classroom were actively participating in the housekeeping center during socio-dramatic play, engaging with their peers and educators. Additionally, Jordan described a child's increased engagement in the following example:

> The child that I was working with in blocks normally does not stay in blocks for more than a minute or two without becoming very frustrated. By using choice making with every block I gave him, he stayed engaged and we played in blocks for 10 min. This was huge for him!

Children learning other skills. Educators reported that children acted more politely during small-group activities (Noelle) and learned content-area vocabulary through the repetition involved in offering choices (Jordan). Moreover, Shay shared, "This was a short study but if these strategies are used daily the overall results for the children could be drastic."

Discussion

The purpose of this study was to explore and describe the perceived social validity of BIE coaching with EC educators. Specifically, we sought to gain a deeper understanding regarding the acceptability of BIE coaching with respect to the learning opportunities provided, feasibility in EC contexts, difficulties encountered, and usefulness in supporting young children's development. Findings are summarized by the social validity dimensions of perceived effectiveness, acceptability, satisfaction, and importance (Horner et al., 2005).

Perceived Effectiveness of BIE Coaching

In these studies, the EC educators self-reported that BIE coaching was effective in promoting their own instructional abilities as well as children's development. Through BIE coaching, educators appeared to learn how to apply the strategies within their classroom activities and they seemed to internalize the strategies, which was evidenced by their spontaneous use of them during both coached and non-coached sessions. Further, most educators self-reported an improvement in their confidence to use the communication strategies and/or to meet the communicative needs of children with disabilities. This finding is important given that educators who report greater confidence tend to provide higher-quality instruction (Holzberger, Philipp, & Kunter, 2013). Moreover, these findings support the research literature suggesting BIE coaching to be an effective means for enhancing educators' instructional practices (e.g., Rock et al., 2009).

Similar to the school-age BIE literature (e.g., Rock et al., 2009), the EC educators who received BIE coaching perceived the children to have improved outcomes in the area that was targeted for intervention. This finding aligns with correlational research demonstrating positive associations between BIE coaching and young children's communicative development (Ottley

Ferron, & Hanline, in press; Ottley & Hanline, 2014). Extending the literature, our research also indicates that educators thought the children had improved outcomes in non-targeted skills, such as vocabulary and social development. For example, Noelle indicated that the children were "more polite." Thus, EC educators' perceptions suggest that children may improve in other skills, such as social skills, that were not specifically targeted, but that are related to the instructional strategies implemented by EC educators.

Data on the feasibility of BIE coaching in EC environments seem to suggest that although the children were interested in viewing themselves in the camera, the technology did not serve as a barrier to children's participation in scheduled activities. Additionally, we had triangulated evidence that EC educators perceived children to be engaged with materials and activities in meaningful ways during BIE coaching sessions. This outcome supports that of Rock and colleagues (2009, 2014), who found children to be significantly more engaged during lessons when BIE coaching was implemented. Collectively, these findings either support or extend the literature base, with all data appearing to indicate that in promoting educators' use of evidence-based practices via BIE coaching, child outcomes may also be enhanced. Thus, EC educators' perceptions that BIE coaching positively influence children's development provides important information regarding BIE's social validity for EC educators who work in inclusive environments.

Perceived Acceptability of BIE Coaching

As EC educators were participating in BIE coaching, they reported that they were able to maintain their typical classroom routines and procedures. We perceived this to be a sign that BIE coaching could feasibly be embedded into EC environments. Consistent with the school-age literature (e.g., Scheeler et al., 2009), educators did not find the intervention intrusive and

reported that it was only minimally distracting to the children. The EC educators' statements seemed to indicate that the real-time coaching was less invasive than they thought it would be and that the BIE technology provided privacy, which enabled normal routines to continue in the classroom while coaching was provided.

The findings from this research provide a deeper understanding regarding challenges with BIE coaching that had yet to be described within the BIE coaching literature. Specific challenges noted were obtaining consent, the high frequency of scheduled coaching sessions, and multi-tasking. These challenges present some important information with respect to delivering BIE coaching in EC contexts. First, it may be helpful to conduct BIE in EC classrooms where the majority of children have consent to participate. This may minimize the challenges involved with only including certain children in the activities in which video-recording occurs. Second, two of the seven educators struggled with the pacing of data collection sessions. Thus, two coaching sessions per day (which was used in Study 1) may be too frequent for EC educators to manage.

Contrary to the EC educators in our study who found it difficult to receive BIE feedback when the classroom was chaotic, the pre-service educators in Rock and colleagues' (2014) study found BIE helpful in chaotic lessons. These opposing data may be the result of differences in the strategies coached or in the educational contexts (school-age versus EC). Importantly, the EC educators found a way to manage these chaotic situations by responding to the coach's feedback when possible, but ignoring some feedback when necessary because of the classroom demands. This finding highlights the flexibility and autonomy provided with BIE coaching in that educators can choose whether or not to respond to the feedback at their own discretion

Perceived Satisfaction with BIE Coaching

The richest information regarding EC educators' satisfaction with BIE coaching was their report that they would use BIE again and that they would recommend it to their colleagues and the children's families. This finding aligns with other research, suggesting that educators who receive BIE (e.g., Rock et al., 2012; Scheeler et al., 2010) and other forms of coaching (e.g., Diamond & Powell, 2011; Marturana & Woods, 2012) enjoy the coaching and/or would recommend it to others. Supporting the school-age BIE literature (e.g., Rock et al., 2014), when coaching is provided from a distance, there appears to be more challenges than when BIE coaching is provided onsite. For example, distance coaching requires reliable internet and the use of additional technology (e.g., web-camera) and a video-conferencing platform. Nonetheless, the educators in this study who received coaching from a distance still reported their appreciation for the coaching, their enjoyment receiving feedback, and their acknowledgement of willingness to use BIE again to enhance other instructional practices.

Perceived Importance of BIE Coaching

With respect to the process of coaching, EC educators reported the benefit of receiving immediate feedback. Immediate feedback supported their learning through the real-time practice opportunities in the classroom context. Jordan had previously received delayed feedback, which was received *after* her university supervisor had observed her classroom practices. She indicated that the immediate feedback was "more effective" than the delayed, because with delayed feedback, "it is hard to go back and think about what the exact situation was and all the details as to what was happening with the children." This finding supports the importance finding documented with the school-age population (Rock et al., 2014).

In addition to the immediate feedback educators receive, the other main component of BIE coaching is the use of technology to provide the feedback. These BIE technologies allow for privacy and discretion in the receipt of feedback, which is made possible through the earbud. Although six of the seven EC educators reported the importance of receiving immediate feedback (see above), only two educators reported the importance of receiving feedback without disrupting the classroom activities. The lack of comments on the privacy of BIE coaching may have resulted from these educators not having experienced immediate coaching without the earbud and thus being unaware of the benefits it provides. Nonetheless, the two EC educators who thought receiving feedback via the earbud was important indicated that this feature was critical so that the children and other educators in the environment were not disrupted by the coaching. These educators also reported that the BIE methods provided them with privacy, so that they could receive coaching without their co-educators hearing what was being suggested for them. Privacy was extremely important for Monique who disliked her co-educator and did not want the co-educator to know her conversations with the coach. Although other types of coaching used in EC environments (e.g., use of hypermedia with video feedback; Diamond & Powell, 2011) offer the opportunity for feedback to be provided in a discrete manner to educators in either written or verbal format, these methods remove the immediacy in which feedback is received. This is problematic, because of all types of performance-based feedback, immediate feedback is the component with the most empirical evidence of effectiveness (Scheeler et al., 2004). Importantly, these findings seem to suggest that the non-disruptive and private nature of BIE coaching may be particularly appropriate for EC classrooms where multiple educators typically teach in the same classroom setting.

The third aspect of BIE coaching that educators reported to be important was the outcomes observed on children's development. At first, several educators were surprised that the children actually communicated in response to their use of strategies. However, as children responded to the educators' use of the communication strategies, the educators seemed to value the strategies more and began to spontaneously use them when coaching was not provided. Furthermore, a co-educator who did not receive BIE coaching, but who observed the coaching sessions, indicated that she would be interested in BIE to see the effect on the children. This demonstrates that the perceived effectiveness of the strategies on children's development may be crucial in getting educators to "buy-in" to evidence-based practices and the BIE mode of coaching.

Conclusion

Collectively, these findings appear to suggest that EC educators perceive BIE coaching to be important and effective in enhancing both their development as educators, and children's targeted outcomes. Educators report satisfaction with BIE as well as acceptability of the intervention. These data align with Horner and colleagues' (2005) recommendations for measuring a practice's social validity and indicate that BIE coaching is a socially valid method of providing professional development for EC educators.

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Table 1

Approaches to Social Validity

Approach	**Description**	**How Social Validity is Determined**
Subjective evaluation (Kazdin, 1977; Kennedy, 1992; Wolf, 1978)	Researcher collects data on individuals' (e.g., experts, educators, parents, participants) perceptions of the intervention	Considered socially valid if individuals perceive the intervention to be acceptable and they are satisfied with outcomes
Normative Comparison (Kennedy, 1992; Van Houten, 1979)	Researcher compares participants' behaviors with those of a typical comparison group	Considered socially valid if participants' behaviors after intervention are within the typical range of individuals not in need of intervention
Sustainability Approach (Kennedy, 2005)	Researcher examines outcomes after the intervention to determine whether outcomes are maintained following treatment	Considered socially valid if outcomes are sustained

Table 2

Triangulation of Data across Methods

Research Questions	**Study 1: Interview Questions**	**Study 1: Video Observations**	**Study 1: Document Analyses**	**Study 2: Document Analyses**	**Study 2: Video Observations**
Learning Experiences	X	X	X	X	X
Perceived Feasibility	X	X	X	X	X
Difficulties Experienced	X	X	X	X	
Usefulness for Children's Development	X	X	X	X	X

Table 3

Triangulation of Data across Participants

Research Questions	**Emily**	**Megan**	**Kara**	**Chante**	**Brandy**	**Monique**	**Lanelle**
Learning Experiences	X	X	X	X	X	X	X
Perceived Feasibility	X	X	X	X	X	X	X
Difficulties Experienced	X	X	X	X			
Usefulness for Children's Development	X	X	X	X	X	X	X

Table 4

Data Iterations and Procedures

ITERATIONS		PROCEDURES
One	Open Coding	Author 2 organized data into the four starter codes, which served as the themes of the study.
Two	Inter-rater Reliability	Author 1 checked 33% of Author 2's initial analysis for inter-rater reliability. The authors reached high agreement of 95%.
Three	Resolving Disagreements	For disagreements, the authors discussed rationales behind theme coding until an agreement was reached.
Four	Pattern Coding	Author 2 examined data within each theme to identify subthemes using pattern coding.
Five	Inter-rater Reliability	Author 1 checked 33% of Author 2's initial analysis for inter-rater reliability. The authors reached high agreement of 94% in learning; 90% in feasibility; 92% in challenges; and 100% in child outcomes.
Six	Resolving Disagreements	For disagreements, the authors discussed rationales behind subtheme coding until an agreement was reached.

Table 5

Amount of codes within each theme and subtheme

THEMES ***N* (% all data)** **Sources of data**	**SUBTHEMES** ***N* (% of theme data in the subtheme)** **Sources of data**				
Educators' Learning Experiences *n* = 235 57.6%	Learning Mechanisms *n* = 122 51.9%	Enhanced Abilities *n* = 113 48.1%			
Educators' Perceptions of BIE Feasibility *n* = 62 15.2%	Maintain schedules and procedures *n* = 48 77.4%	Appreciation for immediate feedback *n* = 8 12.9%	Influence on the children *n* = 6 9.7%		
Educators' Difficulties with BIE Coaching *n* = 49 12.0%	Technology Challenges *n* = 15 30.6%	Multitasking Challenges *n* = 16 32.7%	Technology Distractions *n* = 7 14.3%	Obtaining Consent *n* = 9 18.4%	Scheduling Challenges *n* = 2 4.1%
Educators' Perceptions of Usefulness with Children *n* = 62 15.2%	Increased Communication *n* = 40 64.5%	Increased Engagement *n* = 19 30.6%	Learning Other Skills *n* = 3 4.8%		