

# Speech–Language Pathology Graduate Students’ Questioning Strategies for English Learners in a Simulation Environment

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The purpose of this pilot study was to examine TeachLivE simulation used by speech–language pathology graduate students (SLP GSS) to practice questioning strategies with English learners (ELs) at various language proficiency levels. Using a communities of practice theoretical framework, data were collected through an assignment in a core graduate-level course that focused on assessment/intervention of ELs with communication disorders. The SLP GSS were required to prepare *leveled questions* prior to a simulation experience, respond to a survey, modify questions, and apply leveled questions during the simulation. Their self-efficacy in questioning strategies before and after the simulation was quantitatively measured, and their lived experiences were examined in the qualitative part of the data analysis. Findings suggest that the SLP GSS demonstrated more confidence or self-efficacy in using leveled questions with advanced level ELs and needed further practice adjusting their questions for ELs across other language proficiency levels. Recommendations for using simulation to practice evidence-based strategies are provided. **Key words:** *English learners, graduate students, leveled questions, language proficiency, simulation, speech–language pathologists*

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ENGLISH LEARNERS (ELs) account for approximately 10% of the K–12 enrollment, or 4.9 million students in U.S. schools (Hussar et al., 2020). English learners comprise a highly diverse group of students who bring with them valuable cultural and linguistic assets, including their home languages. Yet, despite these many assets, ELs face significant challenges and academic achievement gaps compared with their non-EL peers (Saunders

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& Marcellotti, 2013; Uro & Lai, 2019). The demand for ELs to engage in increasingly sophisticated language and literacy tasks to acquire and demonstrate knowledge and skills required for college and workforce activities has intensified (Pimentel, 2020). The need to focus on ELs' home languages, support their attainment of English language and literacy, and meet required academic content and achievement standards translates into a critical need for professionals prepared to work with school-aged ELs. Unfortunately, research has shown that professionals continue to be inadequately prepared to provide services to ELs (Bunch, 2013; Caesar & Kohler, 2007; Costa et al., 2005; Gibney & Henry, 2020), and more specifically to work with ELs with communication disorders (Guiberson & Atkins, 2012; Kimble, 2013; Rosa-Lugo et al., 2017; Roth, 2015).

The increase of ELs entering classrooms and specifically those with communication disorders requires professionals to differentiate the performance of bilingual children with a language disorder from those who may display language differences. Once a student is identified as needing speech-language services, speech-language pathologists (SLPs) are required to provide ELs with appropriate evidence-based interventions. In this context, SLPs refer to professionals who provide services to individuals with communication disorders. However, studies conducted over the past have indicated that SLPs often lack confidence and express anxiety in providing culturally appropriate services (Caesar & Kohler, 2007; Guiberson & Atkins, 2012; Hammer et al., 2004; Rosa-Lugo et al., 2017). These studies also noted that undergraduate and graduate students did not always receive the necessary academic and clinical preparation to feel confident when working with ELs (Hammer et al., 2004; Kohnert et al., 2003; Kritikos, 2003; Marante & Hall-Mills, 2019; Milner, 2006; Roseberry-Mckibbin et al., 2005).

To address the need to assess and provide culturally and linguistically appropriate services to EL school-age students, several

graduate programs in communication sciences and disorders (CSD) have offered specialized coursework and/or opportunities to work with bilingual and/or bidialectal populations (ASHAWire, 2014; Lazewnik et al., 2019). Yet, to date, graduate programs remain inconsistent in preparing SLPs to work with bilingual/EL students with communication disorders (Guillory, 2000; Wright-Harp & Munoz, 2000). Programs continue to be challenged in providing coursework and internship experiences that meet this need (Hammond et al., 2009; Quach & Tsai, 2017; Stewart & Gonzalez, 2002; Stockman et al., 2008). Studies suggest that EL school-age children may be either under- or overidentified due to inappropriate assessments by SLPs who may not possess the skills and knowledge to evaluate EL children from diverse backgrounds (Quach & Tsai, 2017; Rosa-Lugo et al., 2020).

Several SLP studies indicated that preservice programs did not prepare SLPs adequately to work with ELs (Edgar & Rosa-Lugo, 2007; Hammer et al., 2004; Kohnert et al., 2003; Kritikos, 2003). In particular, SLPs may not be familiar with evidence-based instructional practices and strategies (e.g., leveled questions and modified text, Kangas, 2014; Nutta et al., 2018) that check for comprehension and facilitate language development in ELs regardless of their literacy background or English proficiency (Edgar & Rosa-Lugo, 2007). English learners often face the dual demands of learning English to communicate in their daily lives (Basic Interpersonal Communication Skills [BICS]) and to comprehend academic language in schools (Cognitive Academic Language Proficiency [CALP], Cummins, 1979, 1980, 1981). To ensure that SLPs understand the challenges faced by ELs, they must be familiar with culturally and linguistically appropriate intervention techniques as well as supports, modifications, and accommodations that facilitate these students' academic success (Kangas, 2014). Because language is key to students' performance, it is important that SLPs are familiar with and feel confident in using strategies

that consider the linguistic needs of ELs at varying levels of language proficiency. Thus, it is important that graduate programs provide students with experiences in creating and practicing their skills with ELs to increase their preparedness to support ELs' language development (Marante & Hall-Mills, 2019; Regalla et al., 2016; Rosa-Lugo et al., 2017).

Therefore, the purpose of this pilot study was to provide SLP graduate students (GSs) with the opportunity to practice evidence-based questioning strategies that could be used with ELs at various language proficiency levels. Specifically, the SLP GSs were required to prepare *leveled questions* prior to an experience in a simulated classroom, respond to a pre-/post-survey, and modify these questions based on different EL proficiency levels during the simulation. Their self-confidence (i.e., self-efficacy [both terms are used interchangeably from here on]) in questioning strategies before and after the simulation was examined. Reflections of their lived experiences were collected to triangulate the data for an in-depth analysis.

## LITERATURE REVIEW

The American Speech-Language-Hearing Association (ASHA) has recognized the need for professionals and practitioners to develop specific competencies and skills to support language and literacy development and facilitate academic success in ELs (Rosa-Lugo et al., 2020). Over the years, ASHA (1985, 1989, 1998, 2004, 2011) developed position statements, technical papers, and policy statements outlining the suggested competencies SLPs need to appropriately assess and treat ELs (ASHA, 2004, 2010, 2016a, 2016b, 2017). A limiting factor in serving EL students in need of services is the disproportionate number of appropriately qualified SLPs. The ASHA (2021) membership numbers continue to reflect a population that is majority Euro-American and likely monolingual English-speaking. Of the total 218,314 members, 92% were White and 8.5% self-identified as racial minority, and approximately 6% of

the members self-identified as Hispanic or Latino.

### Preparation of speech-language pathology graduate students to provide services to EL students

There is an abundance of literature in speech-language pathology and in related disciplines that discusses the challenges faced by bilingual children who are typically developing but are classified as speech-language impaired (causing overidentification of disabilities) or bilingual children with genuine language impairments who are considered typically developing (causing underidentification of disabilities) (Arias & Friberg, 2017; Castilla-Earls et al., 2020; Lugo-Neris et al., 2015; Rosa-Lugo et al., 2020; Roseberry-McKibben, 2021; Whitmire et al., 2014). The combination of these two problems, known as "disproportionality," often results in inappropriate placement or intervention (Levey et al., 2020).

Newly released figures obtained from the U.S. Department of Education shed light on the population of ELs who also have been identified as students with disabilities (Hussar et al., 2020). In 2017, some 718,400 EL students also were identified as students with disabilities. Specifically, EL students with disabilities represented 14.3% of the total EL population enrolled in U.S. public elementary and secondary schools.

### Working with ELs: Perceived knowledge, competencies, and self-efficacy

Over the last two decades, there has been a focused effort to understand and identify the challenges and experiences of SLPs working with ELs. Researchers have explored how prepared SLPs feel to work with ELs (Hammer et al., 2004; Kohnert et al., 2003; Kritikos, 2003). Studies have indicated that SLPs do not feel that their preservice programs have adequately prepared them to work with ELs or accurately determine whether there is a communication disorder or difference in children who speak more than one language (Edgar & Rosa-Lugo, 2007).

Guiberson and Atkins (2012), in their survey study, reported that SLPs felt more confident in assessing ELs whose primary language is English than in assessing ELs with more proficiency in their other language. Kimble (2013) examined 192 SLPs' comfort levels in providing service to ELs. Many of the SLPs reported that they were not comfortable with assessing and/or providing services to EL students. Parveen and Santhanam (2020) examined the perceived competence of 337 monolingual and bilingual SLPs who were working with ELs within the United States. Their survey consisted of three sections: background information, training received on serving ELs, and SLPs' perceived competence in their service delivery to this population. Findings of their survey indicated that monolingual and bilingual SLPs were comparable in their competence levels regarding their service delivery to monolingual English-speaking clients. Yet, bilingual SLPs reported significantly higher perceived competency than monolingual SLPs working with ELs in different areas of service delivery (e.g., assessment and intervention outcomes). Interestingly, positive trends have been noted in two areas of practice: (a) increased availability and access to training and resources, and (b) willingness of SLPs to work with more ELs (Levey et al., 2020).

The development of SLPs' "preparedness" to work with ELs also is critical to their development of self-confidence and clinical competency. An individual's perception of how well they can perform an action in response to a situation is often known in the literature as "self-efficacy" (Bandura, 1977). In other words, people are more likely to engage in activities to the extent that they perceive themselves to be competent. Santhanam and Parveen (2018), in their discussion of clinical self-efficacy among SLPs working with ELs, defined self-efficacy as "a clinician's perception of how confident, comfortable, and competent they feel to create change in clients' communication" (p. 166). When individuals feel less confident in their ability to create a change in behavior, they demonstrate low self-efficacy.

### **Clinical practice in simulated environments**

Graduates of accredited programs in CSD are required to demonstrate academic and clinical education that reflects current knowledge, skills, technology, and scope of practice. The ASHA Certification Standards for Speech-Language Pathology (Council for Clinical Certification in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2018) outline a specific set of knowledge and clinical skills necessary to ensure that SLPs can provide optimum service to individuals with communication disorders. Embedded in the ASHA standards, policies, and associated documents is the requirement for SLPs to use culturally competent assessment and intervention practices in working with ELs. Graduate students develop these skills during academic coursework and placement in clinical/practicum sites. Previous research indicated that SLPs want more opportunities to practice and situate their learning in "real-world" clinical experiences (Quach & Tsai, 2017). Although the ASHA standards call for clinical experiences with diverse students, practicum sites with high concentrations of ELs and the availability of qualified clinical supervisors who have expertise in working with ELs are often difficult to obtain (Dudding & Nottingham, 2018; Lincoln, 2012; Sheepway et al., 2011).

The 2018 revision of the ASHA standards allows for alternative clinical education for up to 20% (i.e., 75 hr) of direct contact hours. This specific change in the standards permits the use of simulation (e.g., mixed reality-based simulations, role play, virtual patients) to address some of the gaps in clinical education (Bouffard-Bouchard, 1990; Pasupathy & Bogschutz, 2013; Williams & Jansen, 2010; Zraick, 2020).

### **Use of simulation technology in CSD graduate programs**

Simulated environments allow for guided experiences that resemble real-world interactions. They provide repeated practice

in a safe environment for both the client and the clinician, and they offer practitioners an opportunity to engage in experiential learning (Dudding & Nottingham, 2018; Jansen, 2015). Although simulations have been used with students in various fields, their use with SLPs is in its infancy (Carter, 2019). Studies have demonstrated that specific tasks can be taught via simulations and its use by students to practice specific clinical skills may enhance self-efficacy in applying these clinical skills (Berkowitz, 2017; Hewat et al., 2020; MacBean et al., 2013; Miles et al., 2016; Williams & Schreiber, 2010; Zraick, 2020). Jansen (2014) examined more than 2,500 computer-based simulations between 2009 and 2013 and concluded that SLPs who used simulations with virtual clients showed better performance compared with other types of simulations such as traditional paper-based case studies or problem-based learning assignments using hypothetical patient examples (Grillo & Thomas, 2016). It also is reported that the most common simulation technologies used by SLPs consist of standardized patients, computer-based simulations, and digitized high-fidelity mannequin technology (Dudding & Nottingham, 2018). The use of virtual reality (VR) also is one of the simulation technologies used in SLP education. However, it is the least utilized form due to its high cost and the lack of experts trained to implement VR (Dudding & Nottingham, 2018; Williams & Schreiber, 2010). Although simulated clients cannot replace a human client, they can provide GSs with opportunities to practice assessment and/or intervention strategies that would be used with ELs.

### **TeachLivE: An evidence-based practice opportunity for speech–language pathology graduate students**

TeachLivE, an innovative simulation technology, was created to support the development of pedagogical skills in preservice teachers, and it is currently used by more than 40 universities to train preservice teachers (Dieker et al., 2014a, 2014b). This simulation technology has been used to develop teaching effectiveness (Dieker et al., 2008;

Hayes et al., 2013), to prepare special education professionals (Dieker et al., 2008, 2016), and to practice teaching strategies with teachers and teacher candidates (Barmaki, 2014; Davies et al., 2020; Dieker et al., 2016). TeachLivE provides an authentic environment for preservice teachers to practice specific teaching strategies based on prepared scenarios through the use of avatars. The immediate feedback obtained with the use of TeachLivE informs the performance of teachers or teacher candidates and allows them to modify and/or continue practicing their teaching skills. Although the benefits of TeachLivE in training preservice teachers have been discussed in the literature (Davies et al., 2020; Dieker et al., 2014a, 2014b; Gardner et al., 2019; Hudson et al., 2019; Towson et al., 2021), its use to increase the competencies of SLPs to work with ELs has not yet been researched.

Thus, the purpose of this pilot study was for monolingual and bilingual SLP GSs to practice questioning strategies with ELs at various language proficiency levels using TeachLivE simulation. The SLP GSs were required to prepare *leveled questions* prior to a simulation experience, respond to a pre-/post-survey, and apply the leveled questions by modifying them according to different proficiency levels of ELs during the simulation. Their self-confidence in using questioning strategies before and after the simulation was measured quantitatively, and their lived experiences were examined qualitatively to understand the possible benefits of using a simulated environment for clinical practice opportunities.

### **Leveled questions: Addressing language proficiency**

Considerable research has been conducted on several widely used evidence-based instructional practices for developing oral language, reading, and writing in ELs (Burr et al., 2015; Ellis, 2012; Gharbavi & Mousavi, 2012; Gibbons, 2008; Herrell & Jordan, 2004; Nunan, 1999; Nutta et al., 2014, 2018; Su, 2005). Twelve research-based English language development instructional practices used with ELs across language

proficiency levels were presented and modeled by the researchers to the SLP Gs in a core course on assessment and intervention for ELs (Nutta et al., 2018). The language proficiency levels of beginning, intermediate, and advanced levels were obtained using the World-Class Instructional Design and Assessment (WIDA) composite levels 1 and 2 for beginning, levels 3 and 4 for intermediate, and level 5 for advanced. The WIDA performance definitions were used as the reference point for the oral language abilities of ELs at these three levels—it is these levels that most professionals are expected to use to differentiate instruction and modify language demands for ELs (WIDA, 2020). Of the 12 practices, *leveled questioning*, an intervention that is highly adaptable by EL proficiency level, was further explored in a course assignment that required its use with EL school-age avatars in a simulated classroom environment (Davies et al., 2020; Dös et al., 2016; Nutta et al., 2018; Regalla et al., 2016). In general, this instructional practice is used to elicit and expand students' verbal and nonverbal responses in an ongoing exchange. Specifically, leveled questioning focuses on adjusting the linguistic complexity of questions so that ELs can comprehend and respond to the questions (Davies et al., 2020; Nutta et al., 2014, 2018).

The simulation experience in this pilot study provided SLP Gs the opportunity to practice oral communication and questioning strategies with virtual ELs in an environment where they could scaffold these interactions. The SLP Gs practiced with ELs (avatars in TeachLivE) at their specific level of proficiency (beginning, intermediate, and/or advanced). This interaction required adjustment of language and instructional features to make the language of the lesson more comprehensible to ELs (Krashen & Terrell, 1983). Due to the complexity involved in determining the necessary adjustments and modifications, SLP Gs practiced modifying conversational interactions with the EL students (avatars).

## Theoretical framework

In any educational environment, learning takes place as a result of interaction among individuals. In other words, knowledge is socially constructed as situated learning occurs. According to sociocultural theory, attributed to Russian psychologist Lev Vygotsky (1978), learning occurs as a result of mediation between learners and more capable individuals, usually a teacher or a professional. In a learning environment (e.g., ELs' language learning context), knowledge is socially constructed as a result of verbal interactions among teachers, SLPs, SLP Gs, and other educators and learners including English for speakers of other languages (ESOL) learners. Lave and Wenger (1991) refer to the social contexts where situated learning occurs as *communities of practice*.

In this pilot study, the ELs (avatars) and the SLP Gs constructed a community of practice where language learning occurred through communication with the ELs. The graduate course served as the platform to discuss cultural competency, and learn about second language acquisition, evidence-based assessment, and culturally appropriate intervention strategies. However, the opportunity to bridge theory to application was provided using TeachLivE. The SLP Gs were asked to prepare questions for different EL school-age students (avatars) with varying levels of English language proficiency.

This pilot study addressed the following research questions:

1. Are there any changes in the SLP Gs' self-efficacy mean scores in using leveled questions (i.e., questioning strategies) to communicate with ELs with different proficiency levels (i.e., beginner, intermediate, and advanced)?
2. Are there any changes in the SLP Gs' overall sense of self-efficacy in administering evaluation procedures before and after TeachLivE simulation exposure?
3. Is there a statistically significant correlation between the SLP Gs' self-efficacy in using leveled questions and their

self-efficacy in administering evaluation procedures after being exposed to TeachLivE simulation?

4. What are the SLP GSs' lived experiences regarding their exposure to TeachLivE simulation and their practice in asking leveled questions and identifying EL language disorder and language difficulty?

## METHOD

### Participants and setting

The participants of the current study consisted of 24 SLP GSs in a master's degree program at one of the largest universities located in the southern part of the United States. The largest ethnic groups in the city where this study took place consist of 37% White, 20% Black or African American, 37% Hispanic, and 6% other multiethnic groups (Vespa et al., 2020). There were 22 monolingual, English-speaking students (21 females, 1 male) and 2 bilingual, Spanish/English students (both females). All the participants (i.e., SLP GSs) were in their fourth semester of their graduate studies consisting of a six-semester program of study. An Institutional Review Board approval was obtained, and convenience sampling was utilized to collect the data from the SLP GSs (Fraenkel et al., 2012). The SLP GSs were enrolled in a CSD graduate course that focused on assessment and intervention in culturally and linguistically diverse populations.

One of the objectives of this course was to identify characteristics/behaviors that differentiate communication difficulties from communication disorders in children and adults from culturally and linguistically diverse backgrounds (i.e., using evaluation procedures). For this purpose, the SLP GSs received a session on how to ask *leveled questions* to school-aged ELs. The SLP GSs were divided into eight groups. Each group was provided with different 5 × 7 pictures depicting various scenarios (e.g., people at a fair). These pictures were provided to the SLP GSs to prepare leveled questions that were to be asked of one of the EL avatars. Each SLP GS was asked to review all background information of four avatars. In particular,

they were asked to become familiar with the characteristics of the various language proficiency levels associated with each of the avatars in TeachLivE. These included beginner (i.e., Gero and Edith), intermediate (i.e., Edgar), and advanced levels (i.e., Tasir). In addition, SLP GSs were required to review these EL avatars' academic achievement gaps because ELs are "doubly tasked with learning the academic content and its associated academic language" to be successful (Nutta et al., 2014, p. 37; see Supplemental Digital Content Figure 1, available at <http://links.lww.com/TLD/A78>).

Due to the double task of learning academic content and using the academic language, the achievement gap may increase, and erroneously result in the child being classified with a communication disorder. Thus, the SLP GSs in the current study were asked to create leveled questions based on each avatar's language proficiency level and their academic achievement gap to determine whether the responses of the EL avatars were indicative of a possible disorder and/or difficulty (see Table 1 for leveled question examples).

Prior to the TeachLivE session, the SLP GSs took a pretest on their self-efficacy in asking *leveled questions*. Subsequently, they were taken to a TeachLivE simulation room in groups of three. This was their first time in the simulated environment. Each group representative greeted the EL avatars first, and asked their group's *leveled questions* while showing their picture. After all groups had completed their tasks, the SLP GSs were taken back to their regular classrooms where they filled out a posttest (i.e., the same self-efficacy survey they took at the beginning of the study) regarding the questioning strategies they used in the session. Their homework for the end of the day was to write individual reflections on the questions they developed, and what they experienced in the simulation task.

### Research design and instruments

The current study is a mixed-methods research design study that includes a pre/posttest quasi-experimental design

**Table 1.** Examples of leveled questions for EL avatars

EL Avatars at Different Levels of English Proficiency	Questions Prepared by One of the Groups Before Exposure to TeachLive
Beginning EL: Edith	<ol style="list-style-type: none"> <li>1. Is this table white or black?</li> <li>2. Point to the brown shirt.</li> <li>3. Are the people sitting or standing?</li> </ol>
Intermediate EL: Edgar	<ol style="list-style-type: none"> <li>1. What is the man doing?</li> <li>2. What is the woman doing?</li> <li>3. Why are there sunglasses on the table?</li> </ol>
Advanced EL: Tasir	<ol style="list-style-type: none"> <li>1. Why is the couple alone at the table?</li> <li>2. Based on his facial expressions, how do you think the man feels about the woman?</li> <li>3. What do you think they are waiting for at the table?</li> </ol>

Note. EL = English learner.

(Fraenkel et al., 2012) and a phenomenological design (Creswell, 2012). The quantitative data were obtained through an adapted survey that the SLP GSs filled out before and after the simulation session (see the Supplemental Digital Content Appendix, available at <http://links.lww.com/TLD/A79>), and the qualitative data were obtained through the SLP GSs' reflection papers based on their lived experiences. Both data sources were anonymous based on a code given to each SLP GS. The SLP GSs were instructed to submit their reflections to the department secretary and they all complied. The researchers collected them within 1 week.

The quantitative instrument that was adapted for this study was the SLP Clinical Self-Efficacy Inventory (SLP-CSEI) by Pasupathy and Bogschutz (2013). The SLP-CSEI was designed based on the standard methodology for measuring self-efficacy (i.e., self-confidence) beliefs as described by Bandura (2006). According to Pasupathy and Bogschutz (2013), the items in the SLP-CSEI were created based on formative evaluation domains of clinical skill development and the domains within the Knowledge and Skills Acquisition (KASA) Summary Form for Certification in Speech-Language Pathology.

The new adapted version of the SLP-CSEI included both knowledge and self-efficacy items and had seven different sections besides a section titled *Communicating with ELs to Assess Communication Disorder*. This

section included items such as *I know how to ask questions that allow pointing, selecting, showing and I know how to ask questions to have ELs do complex analysis, justification, and evaluation*. The second part of the survey included domain-specific clinical self-efficacy items across seven domains presented in distinct sections, including *Case History Self-Efficacy Scale, Evaluation Self-Efficacy Scale, Diagnoses Self-Efficacy Scale, Administrative and Reporting Self-Efficacy Scale, Communication Self-Efficacy Scale, Collaboration and Counseling Self-Efficacy Scale, and Intervention Self-Efficacy Scale*.

The participants were asked to identify knowledge (yes/no) of each associated clinical task and to rate the strength of their self-efficacy for each task within the seven domains. They indicated the strength of their clinical self-efficacy on a continuous 100-point scale ranging from 0 (no confidence at all) to 100 (completely confident). Sample items included *conduct screening and prevention procedures (including prevention activities) in working with ELs with mild communications disorders* (case history domain) and *tailor/adapt evaluation to meet the needs of ELs with severe communications disorders* (evaluation domain). In addition, participants completed the demographics part of the survey. To ensure content validity, the SLP-CSEI and demographics questionnaire were reviewed by two SLP experts and two foreign and English as a



second language education professors with substantial academic experience in speech-language pathology.

For the qualitative data, SLP GSs were asked to write reflections on the following: (a) *a minimum of two reflecting statements on this experience, especially what you learned regarding working with ELs with varying levels of language proficiency*; (b) *one thing you learned or had an "aha" moment about*; and (c) *any suggestions for this experience for the next groups*. The SLP GSs anonymously wrote their reflections and submitted these to the department secretary.

### Data analysis

The scores for the SLP-CSEI were derived by averaging each scale point indicated by a participant across all items for which they indicated they possessed knowledge (all participants indicated they had knowledge regarding every item examined in this study). Only the items for the first section, *Communicating with ELs to Assess Communication Disorder*, and the domain items related to evaluation self-efficacy were examined; items from the rest of the SLP-CSEI were omitted for our study purposes. Normality of the data was checked to determine whether parametric or nonparametric tests were to be used (Pallant, 2011). In this regard, the skewness and kurtosis values were checked for each research question and boxplots were checked for outliers, and then the mean value and the 5% trimmed mean value differences were calculated when an outlier was observed in the boxplots. All the data were found to be normally distributed, and thus parametric tests were employed.

For the first and second research questions, dependent *t*-tests were conducted, while a Pearson correlation analysis was conducted for the third research question. Furthermore, to analyze the qualitative data for the last research question, Braun and Clarke's (2006) thematic analysis procedures were utilized. The steps of this analysis included the following: (a) familiarizing yourself with the data, (b) generating initial codes, (c) searching for

themes, (d) reviewing potential themes, and (e) defining and naming themes. Following these steps, the researchers identified three main themes:

1. SLP GSs' lived experiences and perceptions on TeachLivE simulation;
2. SLP GSs' increased awareness and self-confidence in communicating with ELs; and
3. SLP GSs' needs for guidance regarding simulation experience.

To ensure trustworthiness during the data collection and analysis stages, several methods were utilized. First, after coding, the emerging themes and findings were compared with the previous ones so that the data were constantly compared, and themes were reorganized when necessary. However, member checking was not conducted because the reflections were anonymous, which helped with removing researcher bias. Furthermore, to increase reliability of the qualitative results, the qualitative findings were crosschecked by a professor with specialized training in Teaching English to Speakers of Other Languages and expertise in qualitative research designs. Last, constant comparison and external audit increased the trustworthiness of the findings.

## RESULTS

### Quantitative results

The researchers conducted dependent *t*-tests to answer the first and the second research questions to determine whether there were any changes in SLP GSs' self-efficacy mean scores in using questioning strategies to communicate with different levels of ELs (i.e., beginner, intermediate, and advanced) and also to examine whether there were any changes in the SLP GSs' overall sense of self-efficacy in administering evaluation procedures before and after TeachLivE simulation exposure. The dependent *t*-test results indicated that there was not a statistically significant mean difference between the SLP GSs' self-efficacy mean scores from pretest

**Table 2.** Dependent *t*-test results

Self-Confidence in Using	Pretest <i>M</i> ( <i>SD</i> )	Posttest <i>M</i> ( <i>SD</i> )	<i>t</i>	<i>df</i>	<i>p</i>	95% Confidence Interval	
						Lower Level	Upper Level
Leveled questions with beginner ELs	72 (16)	78 (19)	1.57	21	.132	-2.04	14.51
Leveled questions with intermediate ELs	57 (17)	63 (23)	1.00	19	.328	-5.96	16.96
Leveled questions with advanced ELs	50 (19)	64 (23)	3.45	22	.002	5.44	21.81
Evaluation procedures	56 (20)	64 (22)	2.17	22	.041	0.34	15.34

Note. EL = English learner.

to posttest regarding using beginner-level questioning strategies,  $t_{(21)} = 1.57, p = .132$ . Self-efficacy pretest scores ( $M = 72, SD = 16$ ) were similar to posttest scores ( $M = 78, SD = 19$ ). Similarly, there was not a statistically significant difference between the pretest and posttest mean scores regarding SLPs' self-efficacy in using intermediate-level questioning strategies,  $t_{(19)} = 1.00, p = .328$ , though pretest self-efficacy scores ( $M = 57, SD = 17$ ) were slightly lower than posttest scores ( $M = 63, SD = 23$ ). There was a statistically significant mean difference between the pretest and posttest in terms of the SLP GSS' self-efficacy in using questioning strategies with advanced level ELs,  $t_{(22)} = 3.45, p = .002$ . Posttest scores ( $M = 64, SD = 23$ ) were significantly higher than pretest scores ( $M = 50, SD = 19$ ), indicating an increased self-efficacy in communicating with advanced level ELs after the simulation experience. Table 2 presents these findings.

Furthermore, as seen in Table 2, there was a statistically significant mean difference between the pretest and posttest regarding the SLP GSS' self-efficacy in administering evaluation procedures for ELs,  $t_{(22)} = 2.17, p = .041$ . The posttest scores ( $M = 64, SD = 22$ ) were significantly higher than pretest scores ( $M = 56, SD = 20$ ), indicating increased self-efficacy for administering evaluation procedures following simulation exposure.

To answer the third research question, Pearson correlation was conducted. There was a statistically significant correlation between the SLP GSS' self-confidence in using

questioning strategies and their self-efficacy in administering evaluation procedures only after TeachLivE exposure ( $r = .79, p = .000$ ). This finding indicates that as the SLP GSS' self-efficacy increased in using questioning strategies, their self-efficacy in administering evaluation procedures also increased.

### Qualitative results

The qualitative data were obtained from the SLP GSS' reflections on their TeachLivE experiences. Three themes emerged from the SLP GSS' reflections that were qualitatively analyzed: (a) lived experiences and perceptions on TeachLivE simulation, (b) increased awareness and self-confidence in communicating with ELs, and (c) need for guidance regarding simulation experience (see Supplemental Digital Content Figure 2, available at <http://links.lww.com/TLD/A80>). Findings are presented thematically with selected quotes obtained from the SLP GSS' reflection papers.

#### **Theme 1: Speech-language pathology graduate students' lived experiences and perceptions on TeachLivE simulation**

The majority (96%) of the participants reported that the use of the simulated environment was realistic, safe, and fun. It provided multiple opportunities for practicing how to interact with ELs. The first pattern that emerged within Theme 1 highlighted the realistic aspect of TeachLivE. Twenty-three participants out of 24 found TeachLivE

very realistic. One participant stated, "The Teach Live [TeachLivE] experience was very unique. I greatly appreciated the program and its intent of providing a real-life experience for novice SLPs and educators. I felt the program did a wonderful job of creating characters from various levels and their commitment to the authenticity of the student's personalities." Another participant said, "I really enjoyed the Teach Live [TeachLivE] experience overall. It was initially intimidating because I didn't realize we would essentially be teaching a real class. Instead, I thought we would simply ask the questions to a 'fake' class program and see if it could generate appropriate answers."

Several participants mentioned that the real-life experience helped them to reflect on their field knowledge from a different angle and the interactive nature contributed to their reflection on their communication skills with ELs. For instance, one participant stated, "Not only was [I] able to better understand my ability to modify questions, but also [I was able to better understand] my abilities to work in a group setting with varied abilities." Another stated, "I think my 'aha' moment was the activity itself. It was fascinating to see the student avatars actually interact with the clinicians and get a feel for how to teach these students." Another SLP GSs stated, "I thought the avatars were helpful in learning more realistically about how ELs with varying levels of language proficiency act in the classroom." Overall, the simulation experience was reported to be a realistic experience in which the participants were able to interact with EL avatars and become more aware of how they could communicate with real ELs.

The second pattern that emerged within Theme 1 highlighted how safe it was to work with ELs or patients in a simulated environment. Approximately 88% of the participants mentioned TeachLivE as a safe platform to practice their skills. One participant stated, "This experience provided us with a safe way to practice working with a classroom comprised of students of varying levels of English proficiency." Another participant explained,

"TeachLive [TeachLivE] helped to push my comfort level and stress the importance of not only being able to work effectively and efficiently in a group setting, but also with ELs in general."

The last pattern that emerged within Theme 1 was that TeachLivE provided multiple opportunities for SLP GSs to practice their skills. One participant stated, "I also learned that what you may think the child understands may not be accurate, so you must pick up on cues the child is giving." Another emphasized, "Not only was [I] able to better understand my ability to modify questions, but also [I was able to better understand] my abilities to work in a group setting with varied abilities." Another participant said:

From the TeachLive [TeachLivE] experience I gained value experience working with ESL students at different levels (beginner, intermediate, advanced). Prior to TeachLive [TeachLivE], I did not have any experience working with ESL students, and the appropriate way to communicate with them and ask questions. I now feel that I would be slightly more prepared when working with an ESL student at any level. I also learned strategies that can be utilized when working with ESL students from a variety of language proficiency levels.

Participants found the experience extremely positive, enlightening, and novel. One of them said, "This was a novel experience for us as students and developing clinicians" and 96% of the participants reported that they found the experience to be very interesting and enjoyable. Two of the participants mentioned that it was very intimidating at first because they were not sure what to expect, as they had never been to a simulated environment. However, as they interacted with the avatars, they were more involved and immersed with the simulated environment and its components. Only one participant indicated that his/her overall experience with the simulated environment was negative. This participant found the activity overwhelming and said, "I honestly did not like this experience. I felt like we were bombarded with the experience in general,

without having much background knowledge at all.” Overall, most participants wanted to experience the simulation environment again. One of them mentioned, “Overall, I greatly enjoyed this experience and am excited for the new additions (characters) [avatars] that are being developed for future classes!”

***Theme 2: Speech–language pathology graduate students’ self-confidence and increased awareness in communicating with ELs***

The majority (96%) of the participants reported that their lived experience in TeachLivE caused changes in their self-confidence in determining language disorders and/or difficulties through their practice with questioning strategies. They also reported that they became more aware of certain points they needed to pay attention to while working with ELs. The first pattern that emerged within Theme 2 focused on the speech–language pathology GSS’ self-confidence in using questioning strategies and their learning gains after the experience. Participants reported that they realized they were not using the appropriate language with ELs before their TeachLivE experience. For instance, one participant said, “It is very important to remember the kind of language you are using when interacting with ELs. Much of the language we were using with them was far too complicated for a beginning EL.” They mentioned that they were able to practice how to modify the questions. One participant said, “I learned how to modify questions in real-time depending on a child’s EL proficiency level” and another had a similar idea, “I learned that questions absolutely must be scaffolded appropriately for students with varying levels of language proficiency. If not, the questions are lost on them.” Another mentioned the importance of adjusting questions for ELs’ levels and said, “I realized that the way you ask questions, and the content of the questions will vary depending on the EL’s language level.” Another one said, “I learned about creating appropriate leveled questions for EL students,

based on their L1 and L2 abilities. Prior to taking this class, I was unaware of constructing, delivering, and modifying leveled questions for EL’s.” Another participant mentioned a challenge (i.e., diversity) saying, “All the students have different life experiences, too, so the diversity we are seeing more and more in our classrooms is challenging on many different levels.” Another interesting aspect related to questioning was about avatars’ reactions to questions. One participant said, “I realized that the beginning EL may not be nodding as a way to say yes. She could have been nodding just to feign understanding of the question being asked.” Another SLP GSS focused on a similar point and said:

I specifically learned that although a question may seem simple or not complex, the amount of language needed to answer the question may not be. For example, yes or no questions are considered an easy form of question. If you address the yes or no question with complex language leading up to the options, you may be lost in translation. It is not a reflection on the EL student’s understanding of the question, but a lack of understanding of the language surrounding the question.

Similarly, another participant mentioned the importance of not adding extra cognitive load while asking questions and said, “Inclusion of another phrase could add confusion to a Level 1 ELL [EL] due to their attempt to understand what is being said instead of focusing on us, as the instructor, saying the important things.” Overall, students realized the missing building blocks with their lived experience and identified the missing parts such as how to use leveled questions to reach a main point in communicating with ELs.

The second pattern that emerged within Theme 2 was related to SLP GSS’ awareness after their simulation experience of other aspects of interaction, such as engaging students in conversations, cultural factors, paying attention to their language levels, and the type of support and guidance they could provide for ELs. For instance, one participant said, “an SLP needs to be aware of all students in a group when working with more than one student so that all students are engaged even

if they have varying levels of language proficiency." Another participant stated, "One major thing I learned from this experience is that it can be difficult to keep a group of students at different levels of language proficiency involved and contributing." In addition, regarding interactive conversations, one participant mentioned the importance of seating arrangement and said, "I noticed how Edith kept her head down and did her best to not be noticed. Sitting in the back of the class is the wrong strategy for a student who needs to be engaged as much as possible." Another participant mentioned, "I learned that seating matters, and to not pass over ELs by solely interacting with non-EL students. It can be easy to ask the non-ELs questions and accidentally ignore the ELs, just because the non-ELs answer more fully and quickly."

Furthermore, one participant mentioned his/her cultural awareness and said, "I had never thought about culturally appropriate words before. For example, a student might never have heard of a hot dog or ice cream before, whereas those are so common in our culture." Regarding paying attention to ELs' language proficiency levels, one participant mentioned, "We were able to see face-to-face the responses of English learners of different levels of language proficiency and what level of scaffolding is needed to ensure learning and growth," and another one emphasized that the simulation experience enhanced their knowledge in working with different levels of ELs.

Regarding the SLP GSs' awareness of the type of EL support and guidance needed, they reported that they became more aware of providing more comprehensible input and appropriately scaffolding ELs' understanding of what is being asked. For instance, one participant stated, "The necessity of comprehensible input was reinforced through this experience. Using visuals, simplified sentence structures, movement, and student collaboration are vital to student learning." Another participant said, "I learned that ELs need extra support and guidance in the classroom and group work should be encouraged

so that the students can work together and build language skills along with their peers." In addition, another participant mentioned the support she/he provided and said, "It was definitely helpful to provide visuals and gestures in order to get my point across. You can never fully anticipate their needs, but it is still important to meet them." One of the participants emphasized the importance of scaffolded conversation and stated, "I realized if you begin by discussing topics with the more proficient ELs, the beginner ELs may be able to gather contextual information from that discussion to support their understanding of questions the teacher, ESOL professional, or SLP may present."

### ***Theme 3: Speech-language pathology graduate students' need for guidance regarding simulation experience***

The last theme that was identified through the participants' reflections was related to their need for simulation guidance. Because one of the purposes of the current study was to have the SLP GSs live a novel experience, they were intentionally not informed about how the simulation would take place. They were only told that they would talk to the avatars during simulation and they would be able to ask the questions they prepared. In addition, through the course lectures and assignments, they learned how to modify questions and learned about the avatars' characteristics. In other words, they gained the theoretical knowledge, but as in most cases, the practice part was supposed to be within the simulation. Thus, although 8% of the SLP GSs reported that they felt comfortable and ready for the simulation that they had never experienced, the majority (92%) of the SLP GSs felt uncomfortable.

Regarding the satisfaction with the amount of preparation for simulation, one of the SLP GSs mentioned they found the amount of information well balanced, but they needed to go over the leveled questions they prepared right before the simulation. Another one said, "The assignments completed in preparation of the Teach Live session were helpful in

providing functional information regarding the characters' language abilities."

On the other hand, other SLP GSs mostly expressed their need for more preparation. They felt uncomfortable and expressed lack of self-confidence. One SLP GS said, "I know the element of surprise was the key to us getting the most out of the experience, but I feel like the time could have been used more effectively if we were a little more prepared." Another one stated, "We were not aware of all of the things that we could do with the avatars . . ." Another participant said, "Being underprepared was the biggest problem for most of the students who had to ask questions because we didn't know it was going to be as interactive as it was." Overall, the SLP GSs wanted to know more about how Teach-LivE functioned before they experienced the simulation; however, this would have taken away the novelty aspect that was necessary in the current study to draw pedagogical and clinical implications.

## DISCUSSION

In the current study, the SLP GSs' self-efficacy in evaluating ELs and using level-appropriate questions in a simulated environment with ELs was explored. The study revealed that the SLP GSs, in general, experienced difficulties modifying their questions to match the language proficiency of the EL avatars but the simulation experience did have a positive impact in some aspects of their self-efficacy for questioning and evaluating ELs.

As the quantitative part of the study indicated, the SLP GSs' self-efficacy did not change from pretest to posttest in communicating using questions with beginner- or intermediate-level EL student avatars. Interestingly, when using questions for advanced-level EL student avatars, their self-efficacy increased from the pretest to posttest. The advanced level EL avatar answered more complex questions designed by the SLP GSs than the beginner and intermediate avatars. This result could be attributed to the SLP GSs'

self-efficacy level regarding asking leveled questions when there was a better match between the language of the SLP GSs and the language of the EL avatars. For instance, in Guiberson and Atkins (2012)'s study, SLPs were more confident in assessing ELs whose primary language was English. However, in Kimble's (2013) study, SLPs were not confident in providing service delivery to ELs when the students' corresponding language proficiency level was limited or low.

As noted in their reflections in the qualitative part of the study, the SLP GSs indicated that they became more aware of the difficulties in formulating leveled questions as they communicated with the student avatars of varying language proficiency. They pointed out that their questions should have incorporated the use of simple questions and more visuals and/or graphic organizers when communicating with EL students (avatars) with beginner language proficiency. The use of questioning strategies with EL avatars of varying language proficiency in a simulated environment reinforced that SLPs must be familiar with the stages of second-language acquisition and the corresponding characteristics of each stage (i.e., beginning, intermediate, and advanced) when working with ELs. This must be considered in the assessment of ELs in determining disability and/or language difference.

The SLP GSs' self-efficacy in their use of evaluation procedures before and after the simulation improved, and this appeared to be related to improved efficacy for using leveled questions, though self-efficacy for questioning strategies with ELs at the beginning and intermediate stages of language proficiency was viewed as more challenging than communicating through questions with students of advanced language proficiency. As previously noted, one of the challenges faced by SLPs is how to address the academic and linguistic needs of ELs (Gharbavi & Mousavi, 2012; Gibbons, 2008; Herrell & Jordan, 2004; Nunan, 1999; Nutta et al., 2014, 2018; Su, 2005). Thus, the opportunity to practice how to use leveled questions in a simulation

environment with EL students (avatars) could contribute to their self-efficacy in working with ELs at different language proficiency levels.

As the SLP GSs were provided with more TeachLivE communication exposure with the EL student avatars, opportunities to practice, and instructor feedback, their self-confidence noted in reflections appeared to increase, though this was not borne out fully in the survey results. As noted by the participants, the use of TeachLivE offered the SLP GSs with a safe and more realistic way to practice the use of an evidence-based instructional approach with ELs. These findings align with Dudding and Nottingham's (2018) and Jansen's (2015) findings that note that the use of simulation may provide repeated practice and experiential learning opportunities in a safe learning environment.

Additionally, the bilingual and monolingual English-speaking SLP GSs pointed out that TeachLivE moved them out of their comfort zone and provided them with the opportunity to practice with EL school-age student avatars at different language proficiency levels in a simulated classroom setting. This feature of TeachLivE is reported as a unique feature that provided better alternatives than real-life possibilities regarding their chances of meeting all three levels of ELs at the same time and working with a large group of students as opposed to working with individual students (Burr et al., 2015; Davies et al., 2020; Nutta et al., 2018).

## **PEDAGOGICAL AND CLINICAL IMPLICATIONS**

Several pedagogical and clinical implications could be drawn from the results of the current pilot study. A major clinical implication is the need for SLP GSs to have the skills and competencies to work with EL school-age students. Given the paucity of bilingual SLPs, it is important to mutually prepare monolingual and bilingual professionals to assess and provide appropriate culturally responsive services to ELs with communication disorders.

The use of simulation as an alternative way to obtain clinical competencies should be factored into providing SLP GSs with experience with diverse students of various language backgrounds and proficiency. SLPs also must be provided with opportunities to consider the role of language proficiency in their work with ELs in language/literacy development. Parveen and Santhanam's (2020) study pointed out that bilingual SLPs had more perceived competence than monolingual SLPs in working with ELs on assessment and intervention outcomes. Hence, providing monolingual SLP GSs with opportunities to better understand and implement instructional approaches with ELs reinforces the importance of collaborative work of bilingual and monolingual professionals.

The need to provide good quality clinical education and professional preparation (ASHA, 2021; Dudding, 2015; Dudding & Nottingham, 2018; Mancinelli & Amster, 2015) requires CSD programs to broaden their internship programs in terms of pedagogical and clinical practice opportunities. With the revision of the ASHA standards (ASHA, 2016c) to include the use of a certain percentage of simulation in clinical training, it is suggested that simulation technology (e.g., standardized patients and virtual patients) be considered to provide SLP GSs with simulated clinical experiences to include ELs with communication disorders. As recommended by Dudding (2015) and Dudding and Nottingham (2018), TeachLivE is an example of a good simulation technology to address the paucity of clinical/internship sites and/or clinical supervisors.

## **LIMITATIONS AND FUTURE DIRECTIONS**

Several limitations are noted for the current study. The first limitation is related to sample size. This pilot study does not allow the researchers to generalize the results to larger populations of monolingual and bilingual SLP GSs. However, replicating this study using more leveled question strategies and

avatars representative of diverse backgrounds and language proficiency levels could prepare a cadre of professionals that are better prepared to work with ELs with communication disorders.

This preliminary study focused on only one type of simulation, thereby limiting the generalizability of the findings. Thus, other simulation techniques as alternatives to TeachLivE could be explored in the preparation of SLPs. Another limitation is related to the length of the period between the pretest and the posttest and the number of simulation experiences provided. In other words, the pretest and posttest times were likely too close to each other and the number of simulation experiences (one) was too few to observe major changes in the SLP Gs' self-efficacy beliefs. In future studies, to compensate for this limitation, multiple exposures could be applied and the time difference between the exposures could be varied to evaluate these components. In addition, in the current pilot study, reflections were collected anonymously; however, to better measure the SLP Gs' lived

experiences and to obtain feedback, small focus group interviews could be conducted.

Student reflections revealed that they did not feel comfortable with the simulation environment primarily due to the novelty aspect in this study. In addition, the EL student avatars did not manifest any obvious communication disorders (e.g., articulation) or disabilities (e.g., deafness), but they had language difficulties. They were ELs at different levels of language proficiency with a variety of interpersonal communication skills and academic language difficulties. Integrating several different types of communication disorders into the simulation and training SLP Gs to identify these disabilities in a simulated environment could shed light for the field.

Overall, TeachLivE was seen as a useful tool. The SLP Gs participating in this study, even with limited exposure, became more aware of the need for more guidance, training, multiple exposures, and opportunities to implement evidence-based strategies with ELs with communication disorders.

## REFERENCES

- American Speech-Language-Hearing Association. (1985). Clinical management of communicatively handicapped minority language populations. *ASHA*, 27(6), 29–32.
- American Speech-Language-Hearing Association. (1989). Bilingual speech-language pathologists and audiologists. *ASHA*, 31, 93.
- American Speech-Language-Hearing Association. (1998). *Provision of instruction in English as a second language by speech-language pathologists in school settings*. <https://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2004). *Knowledge and skills needed by speech-language pathologists and audiologists to provide culturally and linguistically appropriate services*. <http://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2010). *Roles and responsibilities of speech-language pathologists in schools*. <https://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2011). *Cultural competence in professional service delivery*. <https://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2016a). *Roles and responsibilities of speech-language pathologists in schools*. <https://www.asha.org/uploadedFiles/Roles-Responsibilities-SLPs-Schools-Poster.pdf>
- American Speech-Language-Hearing Association. (2016b). *Scope of practice in speech-language pathology*. <https://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2016c). *2014 Standards and implementation procedures for the certificate of clinical competence in speech-language pathology*. <https://www.asha.org/Certification/2014-Speech-Language-Pathology-Certification-Standards/>
- American Speech-Language-Hearing Association. (2017). *Bilingual service delivery*. <http://www.asha.org/Practice-Portal/Professional-Issues/Bilingual-Service-Delivery/>
- American Speech-Language-Hearing Association. (2021). *Profile of ASHA members and affiliates, year-end 2020*. [www.asha.org](http://www.asha.org)
- Arias, G., & Friberg, J. (2017). Bilingual language assessment: Contemporary versus recommended practice in American schools. *Language, Speech, and Hearing Services in Schools*, 48(1), 1–15. [https://doi.org/10.1044/2016\\_LSHSS-15-0090](https://doi.org/10.1044/2016_LSHSS-15-0090)



- ASHAWire. (2014). 11 CSD personnel preparation projects receive grants. *ASHA Leader*, 19(12). <https://doi.org/10.1044/leader.NIB1.19122014.10>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-338). Information Age.
- Barmaki, R. (2014). Nonverbal communication and teaching performance. In *Proceedings of the 7th International Conference on Educational Data Mining (EDM)*. London.
- Berkowitz, S. S. (2017). Teaching transnasal endoscopy to graduate students without a hospital or simulation laboratory: Pool noodles and cadavers. *American Journal of Speech-Language Pathology*, 26, 709-715. [https://doi.org/10.1044/2017\\_AJSLP-15-0119](https://doi.org/10.1044/2017_AJSLP-15-0119)
- Bouffard-Bouchard, T. (1990). Influence of self-efficacy on performance in a cognitive task. *The Journal of Social Psychology*, 130(3), 353-363. <https://doi.org/10.1080/00224545.1990.9924591>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bunch, G. C. (2013). Pedagogical language knowledge: Preparing mainstream teachers for English learners in the new standards era. *Review of Research in Education*, 37(1), 298-341. <https://doi.org/10.3102/0091732X12461772>
- Burr, E., Haas, E., & Ferriere, K. (2015). *Identifying and supporting English learner students with learning disabilities: Key issues in the literature and state practice*. (REL 2015-086). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory West. [https://ies.ed.gov/ncee/edlabs/regions/west/pdf/REL\\_2015086.pdf](https://ies.ed.gov/ncee/edlabs/regions/west/pdf/REL_2015086.pdf)
- Caesar, L., & Kohler, P. (2007). The state of school-based bilingual assessment: Actual practice versus recommended guidelines. *Language, Speech, and Hearing Services in Schools*, 38(3), 190-200. [https://doi.org/10.1044/0161-1461\(2007\)020](https://doi.org/10.1044/0161-1461(2007)020)
- Carter, M. D. (2019). The effects of computer-based simulation on speech-language pathology student performance. *Journal of Communication Disorders*, 77, 44-55. <https://doi.org/10.1016/j.jcomdis.2018.12.006>
- Castilla-Earls, A., Bedore, L., Rojas, R., Fabiano-Smith, L., Pruitt-Lord, S., Restrepo, M. A., & Pena, E. (2020). Beyond scores: Using converging evidence to determine speech and language services eligibility for dual language learners. *American Journal of Speech-Language Pathology*, 29(3), 1116-1132. [https://doi.org/10.1044/2020\\_AJSLP-19-001799](https://doi.org/10.1044/2020_AJSLP-19-001799)
- Costa, J., McPhail, G., Smith, J., & Brisk, M. (2005). Faculty first: The challenge of infusing the teacher education curriculum with scholarship on English language learners. *Journal of Teacher Education*, 56(2), 104-118. <https://doi.org/10.1177/0022487104274119>
- Council for Clinical Certification in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association. (2018). *2020 Standards for the Certificate of Clinical Competence in Speech-Language Pathology*. <https://www.asha.org/Certification/2020-SLP-Certification-Standards/>
- Creswell, J. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education Inc.
- Cummins, J. (1979). Cognitive/academic language proficiency, linguistic interdependence, the optimum age question, and some other matters. *Working Papers on Bilingualism*, 19, 121-129.
- Cummins, J. (1980). Psychological assessment of immigrant children: Logic or intuition? *Journal of Multilingual and Multicultural Development*, 1, 97-111. <https://doi.org/10.1080/01434632.1980.9994005>
- Cummins, J. (1981). Age on arrival and immigrant second language learning in Canada: A reassessment. *Applied Linguistics*, 2(2), 132-149. <https://doi.org/10.1093/applin/2.2.132>
- Davies, A. P., Grissom, D., & Regalla, M. (2020). A study on teacher candidates' questioning strategies for English learners through an interactive classroom simulation. *Northwest Journal of Teacher Education*, 15(1), 1-18. <https://doi.org/10.15760/nwjte.2020.15.1.6>
- Dieker, L. A., Lignugaris-Kraft, B., Hynes, M., & Hughes, C. E. (2016). Mixed reality environments in teacher education: Development and future applications. In B. Collins & B. Ludlow (Eds.), *Online in real time: Using WEB 2.0 for distance education in rural special education* (pp. 122-131). American Council for Rural Special Educators.
- Dieker, L. A., Rodriguez, J. A., Lignugaris-Kraft, B., Hynes, M. C., & Hughes, C. E. (2014a). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education*, 37(1), 21-33. <https://doi.org/10.1177/0888406413512683>
- Dieker, L. A., Straub, C., Hughes, C., Hynes, M. C., & Hardin, S. E. (2014b). Learning from virtual students. *Educational Leadership*, 71(8), 54-58.
- Dieker, L., Hynes, M., Hughes, C., & Smith, E. (2008). Implications of mixed reality and simulation technology on special education and teacher preparation. *Focus on Exceptional Children*, 40(6), 1-20. <https://doi.org/10.17161/foec.v40i6.6877>
- Dös, B., Bay, E., Aslansoy, C., Tiryaki, B., Çetin, N., & Duman, C. (2016). An analysis of teachers' questioning strategies. *Educational Research and Reviews*, 11(22), 2065-2078. <https://doi.org/10.5897/ERR2016.3014>

- Dudding, C. (2015, January 1). Full class: Well aware of the shortage of graduate slots, the professions' leading organizations are working hard on solutions. *ASHA Leader*, 20(1), 36–39. <https://doi.org/10.1044/leader.FTR1.20012015.36>
- Dudding, C. C., & Nottingham, E. E. (2018). A national survey of simulation use in university programs in communication sciences and disorders. *American Journal of Speech-Language Pathology*, 27(1), 71–81. [https://doi.org/10.1044/2017\\_AJSLP-17-0015](https://doi.org/10.1044/2017_AJSLP-17-0015)
- Edgar, D. L., & Rosa-Lugo, L. I. (2007). The critical shortage of speech-language pathologists in the public-school setting: Features of the work environment that affect recruitment and retention. *Language, Speech, and Hearing Services in Schools*, 38(1), 31–46. [https://doi.org/10.1044/0161-1461\(2007\)004](https://doi.org/10.1044/0161-1461(2007)004)
- Ellis, R. (2012). *The study of second language acquisition* (2nd ed.). Oxford University Press.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. (2012). *How to design and evaluate research in education* (6th ed.). McGraw-Hill.
- Gardner, M., Melnick, H., Meloy, B., & Barajas, J. (2019). *Promising models for preparing a diverse, high-quality early childhood workforce*. Learning Policy Institute. <https://files.eric.ed.gov/fulltext/ED603416.pdf>
- Gharbavi, A., & Mousavi, S. A. (2012). Do language proficiency levels correspond to language learning strategy adoption? *English Language Teaching*, 5(7), 110–122. <https://doi.org/10.5539/elt.v5n7p110>
- Gibbons, B. (2008). Elementary preservice teachers' utilization of English language development instructional strategies in the teaching of science to English learners. *Multicultural Education*, 15(3), 50–53.
- Gibney, D., & Henry, G. (2020). Who teaches English learners? A study of the quality, experience, and credentials of teachers of English learners in a new immigrant destination. *Teaching and Teacher Education*, 90, 1–12. <https://doi.org/10.1016/j.tate.2019.102967>
- Grillo, E., & Thomas, C. (2016). Using high-fidelity simulation to facilitate graduate student clinical learning. Perspectives of the ASHA special interest groups. *Issues in Higher Education*, 1(10), 4–15. <https://doi.org/10.1044/persp1.SIG10.4>
- Guiberson, M., & Atkins, J. (2012). Speech-language pathologist's preparation, practices, and perspectives on serving culturally and linguistically diverse children. *Communication Disorders Quarterly*, 33(3), 169–180. <https://doi.org/10.1177/1525740110384132>
- Guillory, B. (2000). Project access: A program to improve service delivery for culturally and linguistically diverse populations with speech, language and hearing disorders. *Teacher Education and Special Education*, 23(4), 271–280. <https://doi.org/10.1177/088840640002300404>
- Hammer, C., Detwiler, J., Detwiler, J., Blood, G., & Qualls, D. C. (2004). Speech-language pathologists' training and confidence in serving Spanish-English bilingual children. *Journal of Communication Disorders*, 37(2), 91–108. <https://doi.org/10.1016/j.jcomdis.2003.07.002>
- Hammond, C., Mitchell, P., & Johnson, M. (2009). Academic and clinical preparation for cultural and linguistic diversity in speech-language pathology: Program director perspectives. *Contemporary Issues in Communication Sciences and Disorders*, 36, 63–76. [https://doi.org/10.1044/CICSD\\_36\\_S\\_63](https://doi.org/10.1044/CICSD_36_S_63)
- Hayes, A. T., Straub, C. L., Dieker, L. A., Hughes, C. E., & Hynes, M. C. (2013). Ludic learning: Exploration of TLE TeachLive™ and effective teacher training. *International Journal of Gaming and Computer-Mediated Simulations (IJGCMs)*, 5(2), 20–33. <https://doi.org/10.4018/jgcm.2013040102>
- Herrell, A. L., & Jordan, M. L. (2004). *Fifty strategies for teaching English language learners* (4th ed.). Pearson.
- Hewat, S., Penman, A., Davidson, B., Baldac, S., Howells, S., Walters, J., Purcell, A., Cardell, E., McCabe, P., Caird, E., Ward, E., & Hill, A. E. (2020). A framework to support the development of quality simulation-based learning programmes in speech-language pathology. *International Journal of Language & Communication Disorders*, 55(2), 287–300. <https://doi.org/10.1111/1460-6984.12515>
- Hudson, M. E., Voytecki, K. S., Owens, T. L., & Zhang, G. (2019). Preservice teacher experiences implementing classroom management practices through mixed reality simulations. *Rural Special Education Quarterly*, 38(2), 79–94. <https://doi.org/10.1177/8756870519841421>
- Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., Smith, M., Bullock Mann, F., Barmer, A., & Dilig, R. (2020). *The Condition of Education 2020 (NCES 2020-144)*. U.S. Department of Education. National Center for Education Statistics. <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020144>
- Jansen, L. J. (2014). *The evaluation of computer-based simulated case studies in speech-language pathology education* [unpublished doctoral dissertation]. Nova Southeastern University.
- Jansen, L. J. (2015). The benefits of simulation-based education. *Perspectives on Issues in Higher Education*, 18(1), 32–42. <https://doi.org/10.1044/ihe18.1.32>
- Kangas, S. E. N. (2014). When special education trumps ESL: An investigation of service delivery for ELLs with disabilities. *Critical Inquiry in Language Studies*, 11(4), 273–306. <https://doi.org/10.1080/15427587.2014.968070>
- Kimble, C. (2013). Speech-language pathologists' comfort levels in English language learner service delivery. *Communication Disorders Quarterly*, 35(1), 21–27. <https://doi.org/10.1177/1525740113487404>
- Kohnert, K., Kennedy, M., Glaze, L., Kan, P. F., & Carney, E. (2003). Breadth and depth of diversity in Minnesota: Challenges to clinical competency. *American*

- Journal of Speech-Language Pathology*, 12(3), 259-272. [https://doi.org/10.1044/1058-0360\(2003/072\)](https://doi.org/10.1044/1058-0360(2003/072))
- Krashen, S., & Terrell, T. (1983). *The natural approach: Language acquisition in the classroom*. Pergamon Press.
- Kritikos, E. (2003). Speech-language pathologists' beliefs about language assessment of bilingual/bicultural individuals. *American Journal of Speech-Language Pathology*, 12(1), 73-91. [https://doi.org/10.1044/1058-0360\(2003/054\)](https://doi.org/10.1044/1058-0360(2003/054))
- Lave, J., & Wenger, E. (1991). Perspectives on preparing graduate students to provide services to diverse populations in schools. *Perspectives on School-Based Issues*, 11(2), 33-39. <https://doi.org/10.1044/sbi11.2.33>
- Lazewnik, R., Craghead, N. A., Smith, A. B., Prendeville, J.-A., Raisor-Becker, L., & Silbert, N. (2019). Identifiers of language impairment for Spanish-English dual language learners. *Language, Speech, and Hearing Services in Schools*, 50(1), 126-137. [https://doi.org/10.1044/2018\\_LSHSS-17-0046](https://doi.org/10.1044/2018_LSHSS-17-0046)
- Levey, S., Cheng, L.-R. L., & Almodovar, D. (2020). Developing evidence-based assessment to prevent over or under-identification of disorders for new language learners. *Perspectives of the ASHA Special Interest Groups*, 5, 1026-1038. [https://doi.org/10.1044/2020\\_PERSP-19-00115](https://doi.org/10.1044/2020_PERSP-19-00115)
- Lincoln, M. (2012). The diversity challenge for universities and clinical educators. *Journal of Clinical Practice in Speech-Language Pathology*, 14(1), 2-6.
- Lugo-Neris, M. J., Peña, E. D., Bedore, L. M., & Gillam, R. B. (2015). Utility of a language screening measure for predicting risk for language impairment in bilinguals. *American Journal of Speech-Language Pathology*, 24(3), 426-437. [https://doi.org/10.1044/2015\\_AJSLP-14-0061](https://doi.org/10.1044/2015_AJSLP-14-0061)
- MacBean, N., Theodoros, D., Davidson, B., & Hill, A. E. (2013). Simulated learning environments in speech-language pathology: An Australian response. *International Journal of Speech-Language Pathology*, 15(3), 345-357. <https://doi.org/10.3109/17549507.2013.779024>
- Mancinelli, J., & Amster, B. (2015). Rethinking clinical education. *ASHA Leader*, 20(1), 6-7.
- Marante, L., & Hall-Mills, S. (2019). Today's graduate students, tomorrow's SLPs: Enhancing school practicum experiences. *Perspectives of the ASHA Special Interest Groups*, 4(5), 1128-1135. [https://doi.org/10.1044/2019\\_PERS-SIG16-2019-0003](https://doi.org/10.1044/2019_PERS-SIG16-2019-0003)
- Miles, A., Friary, P., Jackson, B., Sekula, J., & Braakhuis, A. (2016). Simulation-based dysphagia training: Teaching interprofessional clinical reasoning in a hospital environment. *Dysphagia*, 31(3), 407-415. <https://doi.org/10.1007/s00455-016-9691-0>
- Milner, H. (2006). Preservice teachers' learning about cultural and racial diversity: Implications for urban education. *Urban Education*, 41(4), 343-375. <https://doi.org/10.1177/0042085906289709>
- Nunan, D. (1999). *Second language teaching and learning*. Heinle & Heinle.
- Nutta, J. W., Strebler, C., Mihai, F. M., Bryant, Crevecoeur E., & Mokhtari, K. (2018). *Show, tell, build: Twenty key instructional tools and techniques for educating English learners*. Harvard Education Press.
- Nutta, J. W., Strebler, C., Mokhtari, K., Mihai, F. M., & Crevecoeur-Bryant, E. (2014). *Educating English learners: What every classroom teacher needs to know*. Harvard Education Press.
- Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Allen & Unwin.
- Parveen, S., & Santhanam, S. P. (2020). Speech-language pathologists' perceived competence in working with culturally and linguistically diverse clients in the United States. *Communication Disorders Quarterly*, 42(3), 166-176. <https://doi.org/10.1177/1525740120915205>
- Pasupathy, R., & Bogschutz, R. J. (2013). An investigation of graduate speech-language pathology students' SLP clinical self-efficacy. *Contemporary Issues in Communication Science & Disorders*, 40, 151-159. [https://doi.org/10.1044/cicsd\\_40\\_F\\_151](https://doi.org/10.1044/cicsd_40_F_151)
- Pimentel, S. (2020). The immense potential of English learners and their realization of college and career readiness. In J. Patterson (Ed.), *The SAT suite and classroom practice: English language arts/literacy* (pp. 127-151). College Board.
- Quach, W., & Tsai, P. (2017). Preparing future SLPs for the clinical world of cultural-linguistic diversity. *Perspectives of the ASHA Special Interest Groups*, 2(3), 82-102. <https://doi.org/10.1044/persp2.SIG14.82>
- Regalla, M., Hutchinson, C., Nutta, J., & Ashtari, N. (2016). Examining the impact of a simulation classroom on teacher candidates' sense of efficacy in communicating with English learners. *Journal of Technology and Teacher Education*, 24(3), 5-35.
- Rosa-Lugo, L. I., Mihai, F., & Nutta, J. (2017). Preparation of speech-language pathologists to work with English learners (ELs): Incorporating interprofessional education (IPE) and interprofessional collaborative practice (IPP) competencies. *Perspectives of the ASHA Special Interest Groups*, 2(14), 103-121. <https://doi.org/10.1044/persp2.SIG14.103>
- Rosa-Lugo, L. I., Mihai, F., & Nutta, J. (2020). *Language and literacy development: English learners with communication disorders from theory to applications* (2nd ed.). Plural Publishing.
- Roseberry-McKibben, C. (2021). Utilizing comprehensive preassessment procedures for differentiating language difference from language impairment in English learners. *Communication Disorders Quarterly*, 42(2), 93-99. <https://doi.org/10.1177/1525740119890314>
- Roseberry-McKibbin, C., Brice, A., & O'Hanlon, L. (2005). Serving English language learners in public school settings. *Language, Speech, and Hearing*

- Services in Schools*, 36(1), 48–61. [https://doi.org/10.1044/0161-1461\(2005/005\)](https://doi.org/10.1044/0161-1461(2005/005))
- Roth, F. P. (2015). The 21st century educational landscape: Implications for the academic and clinical preparation of SLPs. *Perspectives on Issues in Higher Education*, 18(2), 55–61. <https://doi.org/10.1044/ihe18.2.55>
- Santhanam, S., & Parveen, S. (2018). Serving culturally and linguistically diverse clients: A review of changing trends in speech-language pathologists' self-efficacy and implications for stakeholders. *Clinical Archives of Communication Disorders*, 3(3), 165–177. <http://doi.org/10.21849/cacd.2018.00395>
- Saunders, W. M., & Marcelletti, D. J. (2013). The gap that can't go away: The catch-22 of reclassification in monitoring the progress of English learners. *Educational Evaluation and Policy Analysis*, 35(2), 139–156. <https://doi.org/10.3102/0162373712461849>
- Sheepway, L., Lincoln, M., & Togher, L. (2011). An international study of clinical education practices in speech-language pathology. *International Journal of Speech-Language Pathology*, 13(2), 174–185. <https://doi.org/10.3109/17549507.2011.491129>
- Stewart, S. R., & Gonzalez, L. S. (2002). Serving a diverse population: The role of speech-language pathology professional preparation programs. *Journal of Allied Health*, 31(4), 204–216.
- Stockman, I. J., Boulton, J., & Robinson, G. (2008). Multicultural/multilingual instruction in educational programs: A survey of perceived faculty practices and outcomes. *American Journal of Speech-Language Pathology*, 17(3), 241–264. [https://doi.org/10.1044/1058-0360\(2008/023\)](https://doi.org/10.1044/1058-0360(2008/023))
- Su, M. M. (2005). A study of EFL technological and vocational college students' language learning and their self-perceived English proficiency. *Electronic Journal of Foreign Language Teaching*, 2(1), 44–56. <https://e-flt.nus.edu.sg/wp-content/uploads/2020/09/v2n12005/su.pdf>
- Towson, J., Taylor, M., Abarca, D., Paul, D., & Ezekiel-Wilder, F. (2021). Effects of using mixed reality with coaching on the interprofessional communication skills of speech-language pathology graduate students. *Perspectives of the ASHA Special Interest Groups*, 6(1), 80–100. [https://doi.org/10.1044/2020\\_PERSP-20-00098](https://doi.org/10.1044/2020_PERSP-20-00098)
- Uro, G., & Lai, D. (2019, April). *English language learners in America's great city schools: Demographics, achievement, and staffing* (ED597915). Council of the Great City Schools. <https://eric.ed.gov/?id=ED597915>
- Vespa, J., Medina, L., & Armstrong, D. (2020, February). *Demographic turning points for the United States: Population projections for 2020 to 2060*. United States Census Bureau. <https://www.census.gov/library/publications/2020/demo/p25-1144.html>
- Vygotsky, L. (1978). *Mind in society*. Harvard University Press.
- Whitmire, K., Rivers, K., Mele-McCarthy, J., & Staskowski, M. (2014). Building an evidence base for speech-language services in the schools: Challenges and recommendations. *Communication Disorders Quarterly*, 35(2), 84–92. <https://doi.org/10.1177/1525740113507316>
- WIDA. (2020). *WIDA English language development standards framework, 2020 edition: Kindergarten-grade 12*. Board of Regents of the University of Wisconsin System.
- Williams, S., & Jansen, L. (2010, April). *SimuCaseTM: Interactive case studies for student assessment*. Paper presented at the annual conference of the Council of Academic Programs in Communication Sciences and Disorders, Austin, TX.
- Williams, S., & Schreiber, L. R. (2010). Beyond the big screen: Avatars prepare graduate students for real-world practice. *ASHA*, 11(2), 50–55. <https://doi.org/10.1044/sbi11.2.50>
- Wright-Harp, W., & Munoz, E. (2000). Preparing bilingual speech-language pathologists: The development of an innovative master's degree program. *Teacher Education and Special Education*, 23(4), 290–302. <https://doi.org/10.1177/088840640002300406>
- Zraick, R. I. (2020). Standardized patients in communication sciences and disorders: Past, present and future directions. *Teaching and Learning in Communication Sciences and Disorders*, 4(3), article 4. <https://doi.org/10.30707/TLCSD4.3/KHSI3441>