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Responding to the Endrew's Decision: Measuring Meaningful Educational Benefit

Deborah W. Hartman
Cedar Crest College

Abstract

The U.S. Supreme Court ruling, of March 2017, favored the plaintiff, Endrew F. in the Endrew F. v. Douglas County School District case. This decision strengthens the Rowley decision of 1982 and has raised the bar requiring an increased responsibility for Districts to provide programs to eligible students with disabilities the opportunity to make appropriately ambitious and measured progress. Utilizing methods of progress monitoring and determining the anticipated rate of improvement provides a firmer decision-making process to ensure educational benefit.

Keywords: individual education plan, meaningful benefit, progress monitoring, rate of improvement

Responding to the Endrew's Decision: Measuring Meaningful Educational Benefit

In light of the U.S. Supreme Court ruling, Endrew F. v. Douglas County School District, this article will address how school districts should respond to the decision in this case. In March of 2017, a stunning eight to zero unanimous decision by the U.S. Supreme Court ruled in favor of the case, Endrew F. V. Douglas County School District. Their ruling strengthened the seminal, 1982 special education case, Board of Education of the Hendrick Hudson Central School District v. Rowley. In the Rowley decision, determined that the student's individual education plan (IEP) must be reasonably calculated to enable the child to receive educational benefit. This decision was the gold standard which school districts used to drive the process of IEP development. However, this decision left behind a standard of ambiguity regarding the calculation for determining what was considered an educational benefit.

According to the National Center of Education Statistics (2017), approximately 6.6 million children are served under the Individuals with Disabilities Education Act (IDEA) or 13 percent of the total public-school enrollment. Under the IDEA, an IEP must be prepared and reviewed by the school officials and the child's parents or guardian at least annually. Students with disabilities must be provided a free appropriate public education (FAPE). The term appropriate has ignited the fire of many litigious debates as to argue whether appropriate was provided or not. The term appropriate is vague, at best.

In the Endrew case, the decision implies districts must provide students with disabilities the opportunity to make appropriately ambitious and measured progress. In this case, the parents of a child on the autism spectrum, who attended public school through fourth grade, were concerned he was not making the progress that he should be making. They disenrolled their child from the public school and unilaterally placed him in a private school that specialized in working with children on the spectrum. Endrew made documented progress while in the private school. The parents argued the district should pay for their child's tuition. The district said no. The

parents lost their case before an administrative-law judge, a federal district judge, and the U.S. Court of Appeals for the 10th Circuit, in Denver. The 10th Circuit said the district was only responsible for providing a merely more than a *de minimis* program, a legalese way of saying, not much at all (Lee, 2017). That statement harks back to the old analogy of providing the Chevy but not the Cadillac; it is a floor of opportunity, not the best education available.

However, in the Endrew case, the Supreme Court ruled for a more demanding standard. Chief Justice Roberts wrote that a child's IEP must be "appropriately ambitious," providing the child the chance to "meet challenging objectives." Furthermore, Chief Justice Roberts said that "for children with disabilities, receiving instruction that aims so low would be tantamount to 'sitting idly, awaiting the time when they were old enough to drop out,'" quoting from Rowley (Samuels and Walsh, 2017). In other words, a trivial benefit is not a strong enough standard. The court simply remanded the case back to the Tenth Circuit to be reconsidered in light of the higher standard. In short, thanks to this decision, we now know that IDEA requires meaningful benefits. We just don't know what meaningful means (Dunn, 2017).

That should leave school districts scratching their heads and wondering if they are delivering special education programs that do meet the rigor of this new Supreme Court ruling. School districts should wonder if their programs could withstand this inspection and defend the concept of meaningful benefit. FAPE remains unclear to many within the field of special education or to those who serve as the local educational agent (LEA). LEAs are administrators who have supervisory authority and need to be able to defend their programs. Districts must carefully design educational programs that result in education benefit and are validated through data collection that proves progress toward significant learning (Katsiyannis, Counts, Popham, Ryan, & Butzer, 2016). A legally defensible IEP program will uniquely support the eligible student and optimize conditions, so the student makes meaningful educational progress.

Teams must determine and articulate IEP goals in a way that will demonstrate meaningful progress. IEP teams often struggle with determining the criterion for IEP goals. How much growth should be expected, at times, is only a best guess judgment. Often numbers are tossed out to suggest the degree of expected progress with no more than a gut feeling. Hint, the response to how much growth to specify on an IEP goal is not 85% of the time, as is often noted with no reasonable calculation in mind.

Research has equipped educators with sophisticated and accurate methods for determining reasonable and ambitious growth for many skill areas. The scope of this brief will provide the reader with a way to determine instructional reading levels, determine the rate of improvement, and review a process to monitor progress.

For example, the process of determining the instruction reading level of the student begins with individually assessing the child by conducting a sit-by-the child assessment. In other words, listen to the child read. The reading level is determined by assessing three variables: reading accuracy, comprehension, and reading fluency rate.

The teacher determines the independent, instructional, and the frustration reading levels of the child by assessing how accurately they read the words in the passage. Accuracy is calculated by the percentage of the words read correctly.

The independent level is the difficulty level in which the student can apply the skill of oral reading with accuracy, decode the text, and can comprehend at an appropriate level without teacher support. The student's level of accuracy in reading the words of the passage is 98%-100% with a comprehension of 67%-79%, or scoring three or four on the four-point retell rubric, discussed later in this brief.

The instructional level is the level to instruct the child. The instructional reading materials should match this level. In general, it is the level in which the student can read the words in a leveled passage with 93%-97% accuracy and respond to 75% of comprehension questions or score three or four on the four-point retell rubric. The frustration level is below the accuracy level of the instructional level. Comprehension at this level is 50% or lower or scoring one or two on the four-point retell rubric.

Assessment is conducted using a *cold reading*, which means this passage has never been read by the student before. Reading probes are separate from instructional materials. In anticipation of conducting a reading assessment, the teacher prepares reading passages for multiple reading levels. Prepared passages should be 100 to 250 words in length and the number of words, per a line, should be tabulated at the end of each line of the passage cumulatively.

There are several online resources where a teacher can create, or download leveled reading probes. One resource, *Intervention Central Reading Probe Generator*, can be found at http://www.interventioncentral.org/teacher-resources/oral-reading-fluency-passages-generator. If the teacher creates their assessments, they should use the same reading formula each time to ensure fidelity. Consistently using the same reading formula will avoid conflicts in computed grade levels. Different formulas produce different results. A favored reading formula that can be selected is known as Flesch-Kincaid.

The teacher should prepare multiple passages or probes, of the same difficulty level so that a baseline is accurately established. Weekly progress monitoring probes are created in the same manner. The baseline is established usually using two to three probes of the same level.

There is always some debate as to what is considered a reading error and what is not. So that data are comparable, establishing error consistency rules is essential. Oral reading errors include: mispronunciations, substitutions, omissions, transpositions of word-pairs (counted as one error), and words read to the student by the examiner after three seconds are also counted as errors. Not counted as oral reading errors includes: self-corrected words, repetitions, dialectical speech, and inserted words are ignored.

Reading fluency is the number of words read minus the counted errors. Having a running total of the number of words written at the end of each line facilitates scoring the reading passage. The student reads for one-minute. The teacher should have a timer or a watch with a sweep

hand. The teacher should use the same directions each time an evaluation is conducted to ensure fidelity. The following are standard instructions used by teachers. The point is to apply consistency. "When I say, 'start,' begin reading aloud at the top of this page. Read across the page [point and sweep across the page left to right]. Try to read each word. If you come to a word you don't know, I'll tell it to you. [The teacher will wait for three-seconds before providing a word.] Be sure to do your best reading. Are there any questions? Ready, begin."

The teacher and the student should be looking at the same reading passage. The teacher's protocol has the number of words, per line, and the student's passage does not include the number of words per line. The size of the font should be appropriate for the student's age or needs. The teacher marks the types of errors made by the student on their protocol. At the end of one-minute (precisely) the teacher marks the last word read on their record sheet. The teacher allows the student to continue to read so enough of the passage is read. Comprehension is assessed using a retell method.

The teacher begins to evaluate the student at a passage difficulty level that is anticipated as the student's instructional level. A student may score at the instructional level on multiple levels. The teacher should continue to test at higher levels to establish the frustration level and is prepared to test at lower levels if an instructional level has not been established. An instructional level is established when the student reads 93%-97% of the words in the passage accurately within one-minute.

Once the student has finished reading, the teacher will assess the student's comprehension by asking the student to retell what they have read. The passage is removed from the student and says, "Now tell me as much as you can about the passage you have just read." If the student stops or hesitates, provides a limited response, or gets off-track, the teacher says, "Can you tell me anything else about the passage?" Retell is not a timed assessment. The following retell rubric (Table 1) is used to judge the quality of the student's response.

Table 1
Retell Rubric Comprehension

Acceptable Comprehension	Weak Comprehension
4 – Provides 3 or more details in a meaningful way that captures the main idea	2 – Provides 3 or more details that relate to the passage
3 – Provides 3 or more details in a meaningful sequence, although the main idea may not be stated	1 – Provides 2 or fewer details that may or may not relate to the passage

Fluency rates are collected for each probe read. Once the highest instructional level is determined, based on accuracy and comprehension, the student's reading rate is compared against national or local norms. Norms for oral reading fluency developed by Jan Hasbrouck and Gerald Tindal (2006) are an excellent source for data comparison. These norms were published in *The Reading Teacher*. The Hasbrouck and Tindal Oral Reading Fluency table can be used in various ways. Oral reading fluency rates will allow the teacher to:

1. Identify the fluency rate, by grade level and time of school year, with different norms for the fall, winter, or spring.
2. Match the student's reading rate according to the number of words read correctly per minute.
3. Allow the teacher to determine the percentile level based on the corresponding score.
4. Allow the team to recommend students who need supplemental reading fluency building strategies (students scoring 10 or more words below the 50th percentile).
5. Calculate the long-term fluency goals for struggling readers using the Hasbrouck and Tindal table.

Extensive research was conducted to determined oral reading rates for students in grades one through eight (Hasbrouck and Tindal, 2006). This research established norms for students in those grades during specific time bands; fall, winter, and spring. An average weekly improvement rate, the rate of expected growth known as the rate of improvement (ROI), is reported for the 90th, 75th, 50th, 25th and 10th percentiles. This data allows the team to predict the expected rate of improvement, by the week, based on researched expectations.

Predicting the rate of improvement is calculated by multiplying the anticipated number of weeks of the intervention by the average weekly improvement figure, and then added to the baseline (the number of words per minute read correctly). This calculation becomes the reasonably calculated goal.

Progress monitoring occurs during the intervention and requires frequent data collection using end goal leveled reading passages. Data is graphically displayed to ease instructional decisions. The goal, also called the aim line, is added to the data graph to assist teams in determining if the student's progress is on track or if the intervention adjustment is needed.

The Supreme Court case, Endrew F. v. Douglas County School District, implies a greater emphasis on measured progress. IEPS must reflect more than a *de minimis*, or minimal, educational benefit. Applying the calculation of ROI to establish a criterion or goal is a best practice. The ROI calculation, (ROI x weeks of intervention) + baseline reading rate = goal, provides a scientifically derived method for determining a reasonably calculated method for goal decision-making, not a "pulled out of thin-air" decision.

The use of ROI calculation for goal development is a promising practice and is simple to calculate. Once the instructional reading level has been determined, and a reasonable goal, based on ROI has been calculated, progress monitoring can begin. Through progress monitoring and the frequent review of data, teams will improve the rate of reading growth by making sound instructional decisions in real-time. This systematic method for determining goals and progress monitoring is a satisfying process of applying educational research and optimizing students' academic growth. This method is one way to ensure a defensible IEP under this new evidence-based standard.

This article is written from the perspective of a former director of special education and now a full-time college professor, teaching special education courses at undergraduate and graduate levels. The author is not as an attorney. Teaching and career experiences have provided this

writer with a heightened awareness of the need to require teachers, preservice and experienced, with methods to design meaningful IEP goals that include reasonably calculated criterion. When applying the methods of goal determination and progress monitoring, districts can defend the education benefit realized by all of their students through appropriately ambitious planned programs.

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About the Author

Deborah W. Hartman, M.S., B.C.S.E: Deborah W. Hartman is currently a full-time faculty member of Cedar Crest College and teaches graduate and undergraduate courses in special education. Deborah retired from a large urban school district in Pennsylvania as the executive director of special education. She has extensive experience in supervising a full continuum of services including pre-kindergarten through 12th-grade special education and gifted education programs. She also oversaw Section 504 plans, alternative education, incarcerated youth programs, and specialized services including speech, deaf/hard of hearing, blind/vision support, occupational therapy, and school psychology services. Deborah served as a state-level trainer with the Instruction Support Team initiative and the Student Assistance Programs. She currently serves as a state compliance peer monitor assessing Districts' compliance with the implementation of state and federal regulations of the Individuals with Disabilities Education Act (IDEA). Deborah has worked closely with legal counsel regarding student hearings and has testified, as an expert witness, in federal and state level courts. Deborah is a member of AASEP, NASET, CEC, Kappa Delta Pi, Omega Gamma Chi, and is TESOL Certified.

Social Skills for Students with Moderate to Severe Disabilities: Can Community Based Instruction Help?

Carissa Hernandez, M.A.
California State University Dominguez Hills

Saili S. Kulkarni, Ph.D.
California State University Dominguez Hills

Abstract

The purpose of this research study was to determine how Community Based Instruction (CBI) affects the social skills of middle school students with moderate to severe disabilities. Community Based Instruction is instruction that takes place outside of the school campus and provides students with real life experiences that can help them become more independent individuals and members of society. CBI differs from typical field trips in that CBI outings are IEP based and focus on practicing functional skills that have been practiced in the classroom. The goal is for students with disabilities to begin to generalize these skills in different environments with decreasing amounts of prompting. Existing literature is limited in findings related to the influence of CBI on middle school students with moderate to severe disabilities. This qualitative study was completed using interviews and observations over the time frame of six months. Participants included students, teachers, and paraeducators from a middle school in Southern California. The findings of this study are intended to support the use of CBI in middle school special education classrooms and to demonstrate how a functional program can improve the social skills of students with moderate to severe disabilities. Educators and administrators who may want more information on CBI and its benefits may also utilize the findings.

Keywords: Community Based Instruction (CBI), severe disabilities, Autism

Social Skills and Students with Moderate to Severe Disabilities: Can Community Based Instruction Help?

The ability to navigate throughout one's own community is essential to one's ability to thrive in the community and in life. For individuals without disabilities, navigating the community may seem like a necessary and routine part of life. However, for individuals with disabilities, navigating the community in a functional way can be difficult and filled with many adversities such as how to navigate public transportation, how to complete a monetary transaction or how to access one's local public library or park. Research indicates that children who have special needs often have significant difficulty developing social skills (Siperstein, 2009). In addition, the severity of one's disability directly impacts the cultivation of those skills (deBildt, 2005). CBI should be an essential part of special education curriculum because social skills impact our quality of life so heavily that those who lack them may ultimately experience a lower quality of life if those skills are not effectively developed. A prime example of this is spending time in the community. Spending time out in the community is beneficial to students with disabilities because it aids understanding of typical social exchanges and builds social skills. CBI gives students the opportunity to learn about resources available in their local neighborhoods.

Examples of community living skills that may require specific instruction are: learning how to utilize the public bus system, purchasing groceries, asking for assistance in at a local grocery store or selecting leisure activities. While some of these tasks may seem mundane for non-disabled individuals, they may require intentional instruction for many individuals with special needs, which is why CBI is necessary for the success of individuals with special needs.

The purpose of this study is to understand how CBI affects the social skills of middle school students with moderate to severe disabilities. For the purpose of this study, students who are considered to have moderate to severe disabilities have been evaluated and determined to not have the ability to be successful in any general education courses. These students spend the majority of their day in a special education classroom with similar peers. Parents who wish to educate themselves of the benefits of CBI may utilize this research. Teachers and school administrators who may be interested in how to organize a functional CBI program or how to improve an already existing program can also utilize the information provided.

This research plans to answer the following question: how does Community Based Instruction (CBI) influence social skills among middle school students with moderate to severe disabilities.

Literature Review

This literature review discusses Community Based Instruction (CBI) and the lower expectations that educators place on students with more severe disabilities regarding their ability to participate in CBI. It examines several suggested methods of CBI implementation and various difficulties experienced when implementing a functional CBI program. This literature review also considers the advantages and reasons for CBI as well as reasons for continued research on this topic.

Low Expectations

Recent research suggests that individuals with moderate to severe disabilities are often held to lower expectations. Pickens and Dymond (2015) found that approximately 25% of special education directors interviewed in their study felt that CBI was not appropriate for students with moderate to severe disabilities. Similarly, Roessler & Foshee (2010) found that low expectations of students with disabilities was one of the major factors negatively influencing the development of students' social skills. Perspectives of special education directors play a pertinent role in the success of a functional CBI program and will also play a highly relevant part in the following research.

Langone, Langone & McLaughlin (2000) uncovered similar results in their study, finding that teachers held adverse beliefs regarding students with difficult behaviors being allowed to participate in CBI, indicating that negative behaviors should be completely "eliminated before participating in CBI" (p. 24). Because the following research will examine the effects that CBI has on social behavior, some negative behaviors are an essential part of the research process. According to Langone, Langone & McLaughlin (2000), teachers who had no experience with CBI held more pessimistic views of CBI and believed that students would not generalize skills learned in the community even if they participate in a functionally sound CBI program. Are teachers thinking about students' safety and level of benefit they will receive from

the program or are their lowered expectations pre-determining their students' failures? Students must first be given an opportunity to succeed in order to have any chance at doing so.

Barriers to Implementation

In addition to low expectations and negative perspectives held by teachers and special education directors, recent literature indicated other various barriers to implementing a successful CBI program (Pederson, 2015). A major contributing factor is the predisposition towards inclusive general education placements for students with disabilities (Siperstein, Glick & Parker, 2009). Pickens and Dymond (2015) also explain that IDEA 2004 places greater emphasis on academic achievement, rather than life, functional and social skills. This may be a determining factor related to why directors and administrators appear less willing to approve a functional CBI program. The No Child Left Behind Act of 2001 (NCLB, 2001) similarly mandated that students receiving special education services access general education curriculum (Walker, Uphold, Richter & Test, 2010). Because of this emphasized mandate, students with moderate to severe disabilities are less likely to participate in CBI and learn the life and social skills necessary for post-secondary life. There is an increased focus on in-class core curriculum time, making it difficult for many teachers and administrative staff to understand the relevance of CBI and the benefits it can have on students, especially when paralleled with in-class instruction time.

Walker, Uphold, Richter & Test (2010) also found that barriers to implementation may include a lack of administrative support, lack of community resources needed to design socially applicable experiences to students and lack of staff to provide meaningful instruction. Pickens & Dymond (2015) had similar results, finding that the most barriers to CBI establishment and implementation include "insufficient staff and inadequate public transportation" (p.290). Other concerns that burdened the implementation process include liability and scheduling (Pickens & Dymond, 2015). Concern of possible behaviors that may occur in the community were also expressed in a study by Zion & Jenvey (2006), who reasoned that historically students with disabilities have struggled to adapt to others' emotions and new social situations. Considering the possible positive outcomes of a consistent CBI program, these concerns are worth sorting out.

In addition to lack of administrative support, transportation and scheduling issues, teachers also find it difficult to implement CBI in an "optimal way" (Steere & DiPipi-Hoy, 2012, p. 60). If school administration is concerned about scheduling and students losing in-class time, teachers will have more difficulty executing a CBI program that is regularly and consistently scheduled. This then raises the concern that students with more severe disabilities need repetition, variety and consistency to learn in the most optimal way possible. Langone, Langone & McLaughlin (2000), determined some ways in which teachers were able to overcome the barriers of developing a CBI program. These include persistence, showing school administration positive results of other CBI programs and in one instance, a meeting with the superintendent when no progress was made at a lower level of administration. These barriers and methods used to overcome them can be great resources for educators when they find themselves struggling to implement a well-designed CBI program.

How In-Class Instruction Relates to CBI

Another topic frequently noted in the literature focused on how teachers are expected to implement the CBI instruction itself. Should teachers only teach core subjects inside the

classroom and save all CBI for outside of class? Should they expose students to CBI both inside and outside of the classroom? And finally, what types of CBI activities should be implemented to ensure the best possible learning outcome for students?

Teachers with no CBI experience felt that in-class instruction needed to parallel the topics in the general education curriculum, making it difficult to leave time for instruction that would benefit skills necessary for CBI (Langone, Langone & McLaughlin, 2000). This concern was addressed by Dukakis, Valkanos & Brinia (2013) regarding vocational training. The study emphasized the direct correlation between teaching a subject or area of concern in class before introducing it to students out in the community. Teachers in the study by Steere & DiPipi-Hoy (2012) felt that CBI trips into the community must be frequent in order for students to reap any benefits from these trips. This especially applies to students with more severe disabilities because they need repeated exposure to social situations in the community in order for learning to be most effective. Frequent CBI trips offer the repetition with variety that many students with disabilities need in order to completely grasp a concept.

Other teachers in the study believed that role-play should supplement CBI. Students who struggle with social skills can engage in role-playing activities that relate to the current social skills being focused on in class and/or in the community. For example, if students were going on a CBI outing to the local grocery store, teachers could first model an appropriate role-play activity, underlining the social skills necessary such as greeting the cashier with a "Hello, how are you?" and saying "Thank you" when the transaction is finished. After modeling this activity, the teacher could have two students act out this transaction in front of the rest of the class or even have students complete this activity in small groups. An activity such as this could then be discussed, focusing on the students' strengths and weaknesses.

Another supplement to CBI that teachers in the study believe to be valuable for those who struggle with social skill development related to social narratives. Social narratives tell a story and focus on a particular social skill. These stories may include photos of students in that class inside to make them more engaging and to help students envision themselves using that particular social skill. Teachers who are partial to this method feel that it is best for students who understand what social skills are, but who may have difficulty with the practical steps of implementing the skills (DiPipi-Hoy, 2012). Like any other teaching method, social narratives may be more effective for some students than others.

In addition to the above methods of supplementing and implementing CBI, Steere & DiPipi-Hoy (2012) have also suggested that teachers take notes during the CBI outings to determine students' strengths and weaknesses. This may seem difficult to some teachers with CBI experience, as the outings can be more than enough to keep a teacher busy without being concerned with note-taking. If this is not a feasible option, ask an aide who is also attending the CBI outing to take thorough notes on any strength and/or weakness she/he has seen and that any adult on the trip reports to her/him. This can then guide both school based instruction and community based instruction, allowing teachers to provide students opportunities to improve areas of weaknesses and fine-tune areas of strength.

In addition to these specific methods of implementation, Alberto, Cihak & Gama (2005) suggest that scheduling is a key factor for successful CBI implementation. Their study suggested that CBI must be well planned and thoroughly supplemented with other instructional methods. Classroom-simulated instruction and concurrent instruction in the community and in school are some examples of the suggested methods of scheduling (Alberto, Cihak & Gama, 2005). No matter which method an educator chooses, scheduling that is consistent and frequent is essential.

Purposes of CBI

One of the main purposes for instituting a CBI program is the lack of social and life skills training students receive post-high school. For example, if students can learn to manage their time during CBI outings, this will help prepare them to manage their time when they apply for jobs and need to report to work on time (DiPipi-Hoy, Jitendra & Kern, 2009). Bouck (2010) found that only 24% of individuals with moderate to severe disabilities in the study received life skills training or therapy after high school and only 10% of individuals with moderate to severe disabilities receive relationship skills training post-high school. This indicates that if students do not receive social and life skills training during primary and secondary school, it is highly likely that they will never receive this training. Even if individuals do receive this training post-high school, it will be more difficult to explain a concept that is brand new to someone at the age of 18, as opposed to providing this training to an individual who has been practicing these skills since their early primary grades. IDEA requires every student with an IEP to have a transition plan by age 16, which indicated the importance of students acquiring these skills early on (Williams-Diehm & Lynch, 2006).

Bouck (2010) also discovered that when social and life skills are provided to individuals after high school, they are not adequate and often do not relate to necessary training after school. If training does not relate to the actual skills necessary to individuals after high school, is it really doing them any good? Overall, Bouck's study (2010) suggests that students with disabilities benefit from a life skills curriculum, yet few individuals receive this type of instruction in school. This appears to be a prime example of the impact a functionally sound CBI program can have. Without CBI, students may never be exposed to the actual environments in which they will one day need to utilize their social skills. Without CBI, students are likely to complete high school never having any social or life skills training in any setting other than a classroom.

Individuals with disabilities lag far behind peers without disabilities in terms of employment (Pickens & Dymond, 2015). When individuals with disabilities are employed, they are often employed with far less hours than their non-disabled peers and receive lower wages. They are more likely to be living in poverty and rarely receive medical benefits from their employers (Pickens & Dymond, 2015). This is another reason why CBI is vital to individuals with disabilities. When exposed to the different community settings, students are more likely to form an idea of what they may want to do when they complete high school. This is more likely to happen at the high school level. According to Pickens & Dymond (2015), high school special education teachers have reported that CBI and Community Based Vocational Instruction (CBVI) helps students learn work behaviors, job skills, increased self-determination and independence. These high school teachers also reported that CBI and CBVI assisted students in

"identifying vocational goals and interests and provided opportunities for socialization with typical peers" (p.291).

It has also been found that students with severe disabilities struggle to generalize skills learned (Steere & DiPipi-Hoy, 2012). This is why teachers and administrators at school site, elementary, middle and high school, should consider implementing a CBI program that offers frequent outings into the community. The intent of CBI is for students to learn functional skills within the most natural environments and contexts (Steere & DiPipi-Hoy, 2012).

Methodology

This study involved qualitative data collection. Qualitative research is useful for this study because it allows in depth exposure of ways in which CBI can be utilized. Qualitative research is very specific and focuses on all of the complexities of the particular group and issue being studied; in this case middle school students with moderate to severe disabilities.

Participant Selection

The study was conducted at a public middle school in one of the largest school districts in Orange County, California. Students involved in the study were 7th and 8th graders who spent more than 50% of the instructional day in a self-contained special education classroom. Participants were selected using a convenience sample. Participants were students and educators at the school site where the researcher teaches, which also makes this a purposeful sample because students at the school site were easily observed. In addition to the classroom teacher, other participants included two classroom paraeducators who work with all eight students on a daily basis. The students have differing disabilities including Autism, cerebral palsy, Down Syndrome among other intellectual disabilities. Their reading levels range from pre-kindergarten to fourth grade. Two students are non-verbal. The classroom teacher is a Caucasian female in her late thirties. This was her first year as a full time teacher of record. One of the paraeducators is a Lebanese female in her fifties while the other is a Latina in her early twenties. The two paraeducators have worked at this particular school site as paraeducators for a combined total of fifteen years. This also made it easy for the researcher to contact educators to schedule interviews (Creswell, 2002). Below, Table 1 provides the participants' demographic information.

Table 1
Participant Demographics

Participant	Ethnicity	Age	Occupation	Experience	Education
PE1	Latina	23	Paraeducator	5 years as para-educator	Will complete B.A in May 2016
PE2	Caucasian	39	Special Education Teacher	First year teaching 2 years of long-term substituting 10 years of behavioral therapy	Has completed B.A. and preliminary education specialist credential
PE3	Lebanese	54	Paraeducator	9 years as a paraeducator	Some college

Research Design

The researcher accompanied teacher, paraeducators and students on their weekly CBI outings. The teacher did not follow a specific curriculum but did tailor the weekly trips so that they matched as closely with the curriculum focus as possible. The teacher had not had any formal CBI training. Teachers and paraeducators were interviewed regarding the changes they had seen in their students' social skills since participating in a comprehensive and consistent CBI program. The researcher asked questions such as "How would you describe Student A's social skills before she began participating in CBI?" and "How would you describe her social skills now that she is currently participating in CBI?" Interviews were approximately thirty minutes each. Interviews took place in a local coffee shop that was quiet enough so that the participant and researcher did not become distracted. The volume level and atmosphere was calm so that interviewees felt comfortable speaking their most true and genuine thoughts without fear of any repercussion or negative consequence. The researcher audio recorded the interviews using a mobile device with the permission of each interviewee. She then transcribed each interview in full into a Microsoft Word document.

Observation

Observations took take place in the classroom where children could be observed in an environment in which teachers and students are familiar and feel comfortable. Observations also took place out in the local community during CBI outings. Before observing students, the researcher was sure to greet them and let them know she would be visiting the classroom sporadically and joining them on their CBI outings. This way, students were well aware of the researcher's presence and not distracted by it. While observing, the researcher took notes on the actions and behaviors observed. Notes were fact-based, and attempts were made to remain unbiased and objective by taking fact-based notes without any inference of the motivation behind behaviors. Overall, this research took place in the classroom at the school site in Orange County, CA, in the lunch area where most social opportunities present themselves and in the local community where students and staff go on their CBI outings. Students, teacher, and paraeducators participated. Social skills were monitored throughout the course of the research. Notes about students' social interactions were made during observations. This

research addressed and explored the quality of social skills among middle school students with moderate to severe disabilities. This research also exposed how CBI influences social skills among these students.

Data Analysis

Data were collected for this research via observations and interviews. The teacher and paraeducators were interviewed, answered questions about a Community Based Instruction (CBI) program that was initiated at the school site, how it was structured and what social skills they saw the students exhibiting during the CBI outings as well as on the school site campus. The researcher also observed all eight students in the special education classroom on the CBI outings, during their thirty-minute lunch period, and during their general education elective periods, which totals approximately thirty-six hours of observation. Each observation that took place inside the special education classroom was approximately thirty minutes long. Each CBI outing, including the walk to and from the destination, took approximately two hours. The observations that took place in the general education class were approximately forty minutes per session. The researcher found that students' social skills increased after by the end of the study. Students were better able to navigate the community in a safe manner. The researcher also found that student behavior was most favorable during CBI outings. This was found through observation and paraeducator interviews. Findings showed that students learned social skills and math skills, specifically time and money, within the classroom, and were then able to generalize these skills out in the community in various settings.

Coding

Throughout the duration of the interviews, observations and coding and analysis process, the researcher found several recurring themes. The researcher used a combination of In Vivo coding, beginning with first cycle coding (Saldana, 2009) and Descriptive Coding (Saldana, 2009). The themes that naturally arose included social norms, travel time, math skills, cooking, social skills practiced during CBI, whom students socialize with and "hopes for the future." NVIVO® coding was used to create the theme "hope for the future." Two participants stated the exact phrase "hope for the future" during their interview with the researcher when discussing the social skills they hope the students will have learned. They expressed that certain skills could aide the students in living as independently as possible once they are finished with school.

The researcher felt that this exact phrase spoken by participants spoke directly to the research question of whether or not CBI can improve the social skills of middle school students with moderate to severe disabilities. The paraeducator participants expressed that their hope for the future was that the students could put the skills they learn at school and out on CBI outings into practice in their own personal lives at home with their parents now. Additionally, they expressed their hopes that the skills would carry over into students' adult personal lives so they would live independently. These themes were relevant to the research question of how CBI can affect the social skills of middle school students with moderate to severe disabilities. They were also created using descriptive coding. With descriptive coding, the researcher summarized each topic that repeatedly arose in both the interviews and observations. The following themes were revealed through the analysis: social norms, travel time, math skills, cooking, social skills practiced during CBI, and individuals with whom students socialize.

Trustworthiness/Reliability
Trust was established in several ways throughout this study. The researcher held multiple interviews with multiple participants. Multiple collection tools were used which include observations and interviews. The researcher audio recorded all interviews and transcribed each interview verbatim. The intent of the study was to show that CBI can positively affect the social skills of middle school students with moderate to severe disabilities, was made clear to the participants. The researcher also assured participants that all names and places where research took place would be kept confidential. Therefore this study involved very little risk. There was minimal risk of physical or psychological harm because students were simply being observed and teachers were interviewed only to their own personal level of comfort. All of the above factors created a trustworthy rapport between researcher and participants.

Results

The purpose of this study was to determine whether community based instruction influenced the social skills of middle school students with moderate to severe disabilities. During the study, the researcher answered the following question:

1. *How does community based instruction influence social skills among middle school students with moderate to severe disabilities?*

Social norms were a repetitive concern indicated by both the special education teacher and one of the paraeducators. During the interview with the special education teacher, L.K., she stated that during CBI, "students are exposed to social norms such as how to greet someone, appropriate ways to ask for help and how to handle certain unpredictable situations such as seeing a person with a dog walk by." A situation like this has the potential to be a trigger to some students and may incite anxiety or fear. Paraeducator R.C. stated during the interview, "There are a lot of teachable moments for the students that come up when we are walking around the community." This suggests that CBI offers many opportunities for students to learn social norms during the weekly CBI outings. Learning social norms appeared to be one of the top concerns of the teacher and paraeducator, focusing especially on how to handle unexpected social encounters. These social encounters usually occurred during the travel time to and from the weekly CBI destination.

Travel Time
The travel time to and from the destination was another recurring theme throughout interviews with the participants. The significance of this theme was also found during the observations that took place on the CBI outings. During the time that students spent walking to and from that week's destination, they were given a chance to converse about school, friends, family, weekend activities and anything else of interest to them. It was an opportunity to practice initiating conversation, taking turns during conversation, maintaining eye contact during conversation and working on appropriate responses to one another. The paraeducator A.K. stated, "The kids have a lot of social opportunity just on the walk to and from wherever we are going. That's kind of like their time to socialize without structure." This statement is a representation of how important it was to the staff in this classroom that students had unstructured social opportunities

where they could practice skills they had learned prior. Travel time during CBI seemed to be just as, if not more, important than the skills learned at the destination itself. The researcher also observed similar behaviors. When out on a CBI to a local eatery, student A.N. expressed to student L.H. "I'm going to order chicken strips. What are you going to get?" This gave student L.H., one of the least social students in the class, a chance to respond and continue in some peer-to-peer conversation.

Math Skills

A consistent skill that was practiced and applied at every CBI destination was math. The skill of math in this context included budgeting, totaling costs, finding the best bargains, calculating and estimating time, counting money, calculating and confirming the accuracy of change given to students by the cashier. As observed by the researcher, students utilized math skills when estimating a budget for items needed from a particular location such as a local grocery store. In class, when estimating and budgeting, student A.V. said "I have three dollars. I think I'll be able to buy one snack and a gift for my mom." During the researcher's CBI observation, students decided which brands to buy to get the most product for their money. In the store, they discussed amongst themselves about which product they should buy. For example, before making her final decision, student J.P. asked teacher L.K. "These chips are the best deal right?" They also learned and practiced how to pay for items and count money in order to be certain that correct change was given after the transaction.

The researcher noted students practicing their time skills by estimating how much time they would have at each destination. The majority of students knew what time they needed to be back to school and were prompted by staff to calculate how much time they would have at the destination and what time they should leave to give themselves enough time to walk back to school. The special education teacher also expressed the importance of this skill by saying "The kids learn to be responsible by estimating how much time they have. Some like to ask what time it is and how much time we have until we get back. Now, most students know to simply ask for the time so that they can estimate it themselves." The researcher was surprised to see how often. This is a very real-life skill that anybody with any type of schedule would use and need on a daily basis. It was clear from the observations of the researcher and the interview of the special education teacher that keeping a schedule and following it independently is a skill that is highly valued inside and outside of this classroom.

Cooking

In this research, the theme of cooking included the following: deciding what to cook, making a list of grocery items needed, calculating a budget, finding the most valuable prices at the store, navigating the store to find the necessary items, paying for the items needed for cooking, preparing the food items bought at the store, using those items in a safe and sanitary manner in the classroom, eating the food that was prepared, cleaning up and storing leftover food properly. The researcher observed students practicing all of these skills on an average of one to two times per month in combination with weekly CBI outings. Students observed in this research were not only learning the entire process of cooking for themselves, but also how to budget and shop for healthy foods at a reasonable price. The special education teacher stated how important she felt cooking was when she stated that "Cooking the ingredients we buy at the store really brings CBI and life skills full circle. It's almost like a mini project where every week

students get to choose what to cook and buy the ingredients which are skills within themselves, but then they also learn the life skill of cooking which is extremely valuable." The paraeducator shared similar views and expressed "The kids get to cook, which they love. They are having fun while learning and it doesn't really get any better than that." Based on observations and interviews, the researcher found that CBI did not happen in an isolated manner. Many skills were interwoven into the program and cooking was the most common skill that was practiced and applied after the CBI outing.

Social Skills Practiced During CBI

The theme of "social skills practiced during CBI" refers to the skills that are exclusively put into practice during CBI. A major common theme conveyed by participants was safety within the community. Specific examples given during the interview with the paraeducator included learning to obey the safety and community signs on the streets such as "walk," "don't walk," "stop" and "beware of dog." During observations, the researcher heard several students point out these signs while simultaneously gesturing along with it saying, "Wait, the red hand means stop" and "Look both ways first. Are there any cars? No." Students practiced navigating their communities on a weekly basis. Another example of social skills practiced during CBI given by a paraeducator was that students treated each other with more kindness while at the park engaging in structured sports games together. Teacher L.K. stated, "The students argue less during CBI outings compared to the amount of arguing that takes place here on campus." Students appeared to understand that CBI was a privilege and behaved in a friendlier and less argumentative manner than while in the classroom.

The researcher observed that many of the students wanted to be in the front of the group when walking to their CBI destination. The skills of patience, respecting personal space and saying "excuse me" if and when a student passed by another student, were regularly demonstrated during every CBI outing. The special education teacher stated, "A lot of the kids tend to want to be in front of the group, but now they know that they will have to walk in the back of the group if they are not polite or don't say 'excuse me' when passing by another student." Once the destination was reached, options were often presented to students; whether it was the option of which game to play at the park or which section of the store they wanted to head toward first, students learned to make decisions together by discussing amongst themselves and received advice from adults when solicited. The social skills that emerged and were practiced during CBI included such activities as community safety, politeness, manners and personal space were not only noted by participants, but also observed by the researcher on multiple occasions. During CBI, students practiced these skills with one another and then practiced the same skills on campus with their typical peers as well.

Socialization

The theme "Socialization" refers to how students put their social skills into practice both on campus with their peers and off campus with other members of the community. Many of the skills practiced during CBI were not only applied on the CBI outings themselves, but also at the school site. For example, paraeducator R.C. stated in an interview that she noticed students greeting friends they have made at lunch "more often than in the beginning of the year." The researcher observed similar skills in the general education elective classes. Students with

moderate to severe disabilities called on their general education peers for help in class, which was encouraged by both the general and special education teachers.

Additionally, students had the opportunity to be social with their typical peers every day during lunch as observed by the researcher. Typical students who were part of a club called the Kindness Club would sit, eat and converse with the special education students during lunch. Most of the special education students enjoyed this time and were very open and friendly, greeting their peers properly and asking friendly and appropriate questions such as "how are you?" or "how was your weekend?" The skills practiced during CBI were clearly being applied onto the school campus, which demonstrates the students' ability to generalize the social skills they have learned. While students were improving their social skills that were being used on campus, they were also getting the chance to socialize with members of the community such as cashiers, grocery store clerks, members of the community at the park and local small businesses. These social skills are likely to positively impact each student's independence and in turn, their futures.

Hopes for the Future/Independence

Another theme that arose during the course of this research was "hopes for the future" and independence. A common hope that was expressed by both the classroom teacher and paraeducators was that all of the students would one day have the ability to live independently. Paraeducator A.K. expressed that she "just hope[s] students will be able to feed and clothe themselves, shop for groceries independently, keep a clean living space and obtain and maintain a steady job." The teacher, L.K., also expressed her hopefulness by genuinely stating, "I hope so much that they will be able to wake up on their own and follow a schedule throughout the day. This schedule would include cooking breakfast, making their beds, going to work, visiting with family and doing household chores." It was made clear to the researcher that although CBI is taking place when students are in middle school, it has the accompanying educators thinking into each student's future and how it may affect their independent living skills.

Discussion and Conclusion

Overall, this study focused on whether or not CBI influences the social skills of middle school students with moderate to severe disabilities. It also focused on how CBI affected their social skills, specifically in the school setting. The researcher observed the students at their school site for a total of approximately thirty-six hours. In addition to observing the students, the researcher also interviewed the special education teacher and two paraeducators who work with the students daily. The researcher interviewed the educators several times to discuss student progress throughout the duration of the study as well as when CBI trips occurred throughout the school year.

As the study progressed, the researcher observed different themes that consistently arose; for example, socialization and math. These themes were frequently present because students were given both ample opportunities to socialize informally during CBI and practice their math skills, specifically time and money skills as they related to the students' CBI outings and daily schedules. Moreover, these skills were reinforced by the adult participants who were interviewed. They informed the researcher that they felt CBI

gave students an opportunity unlike many others available on campus, which are valuable and can benefit them in their post-high school and adult lives.

How does Community Based Instruction (CBI) influence social skills among middle school students with moderate to severe disabilities?

After extensive observations in various locations including the classroom and local community, the researcher gleaned that CBI increased the amount of self-initiated socialization during CBI outings. This increase was especially noticeable in comparison to the average school day on the school site campus. This socialization did not only happen among students and between students and staff, but also between students and local community members. These community members included families at the park, local store-owners, grocery store cashiers and local residents in general.

A pivotal example of student interaction with a community member took place during a monetary transaction. The student, J.C., was ready to purchase an item and looked to the teacher for help, saying "Help me, please." Inferring that J.C. could not complete this transaction independently, the teacher turned and began to walk away from the student hoping to force him to interact with the cashier and complete the transaction. This action indeed forced what otherwise would have been a prompted interaction. J.C. responded to the cashier's greeting and completed the transaction independently. He also waited for his change, which, as stated by his teacher, had been difficult for him to remember on past occasions.

The experience of completing monetary transactions is a prime example of a skill that can be practiced by students out in the local community. Students can hone these skills in the classroom by practicing their addition and subtraction skills, specifically with money. However, being out in the community and having real life experiences where these skills are put into practice cannot be substituted in the classroom. The teacher, L.K., later informed the researcher that when she walked away from her students during that transaction, she was trying to force the cashier to interact with her student instead of the cashier assuming that she would speak for J.C. to help him complete the transaction. The teacher, L.K., informed the researcher that this was not the first time she had done this. She said she noticed that the further away she was in proximity to both the cashier and her students, the more independent her students acted and carried out social interactions.

Practicing these skills in the community displays how valuable they are and that the environment cannot be substituted on the school campus. On the school campus, teachers and paraeducators are there to facilitate and provide instruction as well as to prompt students until they are able to solve the task at hand. However, once students venture into the local community where they live, they gain the opportunity to undertake these tasks independently and more often than not, they rise to the occasion.

Similar to the research of Langone, Langone and McLaughlin, (2000) who found that 67% of teachers in their study said they saw a decrease in inappropriate behaviors during CBI outings, this study revealed that fewer negative behaviors occurred during CBI outings. Participants in

this study also stated that they noticed students' behavior was generally more positive on CBI outings when compared to their behavior inside the classroom. Paraeducator A.K. stated, "I think they feel more comfortable during CBI and they know that it is a privilege. That is why I think they behave better than they tend to at school." The researcher's observations indicated the same information. Students seemed happier, more respectful and more comfortable with less pressure to perform well on assignments or obtain correct answers.

The researcher also gathered sufficient data from the interviews held with the teacher and paraeducators. Much of what was observed by the researcher was reaffirmed during the interviews. For example, when asked about the social opportunities during CBI, paraeducator R.C. stated, "I notice the students initiating conversation and being themselves more while we're out on our trips. It seems like they feel more comfortable in a setting that is different from the classroom." The teacher, L.K. made a similar point saying, "I don't think my students would be as social as they are here at school if it weren't for CBI." The students were presented with more social opportunities during the CBI outings. The teacher and staff reviewed what happened during the CBI outing so the skills were constantly reinforced on campus.

Limitations

Limitations for this study included duration, location, and sample size. This study could have consisted of a pre and post treatment, meaning the students could have been observed and the staff interviewed prior to ever having been exposed to CBI at all. The researcher could have then observed students and interviewed staff throughout the school year as well as the following year to get a more long-term view of how CBI may have affected each student's social skills. Also, the researcher could have observed a class of middle school students with moderate to severe disabilities at more than one school site to see how the location of the school may have impacted the social skills of students. The difference in staffing may have also played a part in the outcomes. Finally, the researcher notes that due to the small sample size, the results of the study are not necessarily generalizable.

Conclusion

In working to find an answer to this question, the researcher found that Community Based Instruction positively influences the social skills of middle school students with moderate to severe disabilities. Skills that have been practiced and improved over the course of this study include counting money and correct change, telling and estimating time, calculating the most affordable prices, following directions, making eye contact, following safety and community signs while out in the community, greeting people, taking turns, working as a team, making decisions together, using manners, respecting personal space, conversational skills with peers and adults and conflict resolution. Students appeared to enjoy the CBI outings and greatly benefited from it in terms of social skills, including grocery shopping, following a recipe and math skills. Both paraeducators and the special education classroom teacher noticed improvements in student behavior, specifically in terms of group decision-making and expressing disagreement. Overall, this study has found CBI to have a positive impact on student behavior.

Implications for Practice

This study was intended to help any K-12 teachers who might be considering starting a CBI program on their campus. While this study took place on a middle school campus, the researcher recommends starting CBI at the elementary level. If students were exposed to CBI at the elementary level, even as often as once or twice per month, they may be able to focus more of the complexities of the social skills once they reached middle school. Students typically do not gain exposure to CBI until secondary school and are expected to apply the skills that are practiced out in the community as well as function independently all within four to six years. If students began CBI earlier, they may be able to cultivate their social skills at the elementary level and refine those skills once they have reached the secondary level.

In addition to beginning CBI earlier, providing professional development to teachers, paraeducators and administrators, may be beneficial and lead to more administrative support. If entire districts understood the benefits, more students with disabilities would be exposed to a consistent and age-appropriate CBI program throughout the entirety of their school careers. This study may also be helpful for parents to understand the rationale for CBI programs.

Implications for Research

In order to improve future research on Community Based Instruction, researchers may focus on CBI at the elementary and high school levels. They may also interview parents regarding the social skills of students and how they feel CBI has influenced the social skills of their children. Completing a longitudinal study with students who begin CBI at the elementary level and continue it throughout secondary school may provide more in-depth results. Furthermore, researchers completing a longitudinal study may observe how their social skills progress throughout the K-12 school system and into post-high school life.

If a follow up study were to be conducted, the researcher may want to consider having a control group of middle school students with moderate to severe disabilities and a group who is participating in a consistent and functional CBI program, so that the two groups can be compared and contrasted. The researcher would observe and accompany both groups during their CBI outings and interview the teacher and staff of both groups regarding their experiences with CBI. Future researchers may want to include school administration in their study. This could provide an understanding of why some school sites do not have CBI programs.

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About the Authors

Carissa Hernandez, M.A. is a middle school Special Education Teacher in Orange County, CA and is currently working on her Administrative Services Credential at the University of Southern California.

Saili S. Kulkarni, Ph.D. is an Assistant Professor of Special Education at California State University Dominguez Hills with a research focus on students with significant disabilities and equity issues in schools. Dr. Kulkarni obtained her doctoral degree from University of Wisconsin-Madison in 2015.

Mobile Hearing Screening in a Rural Community School in Ghana

Anthony M. Denkyirah
Southern Illinois University Edwardsville, USA

Yaw Nyadu Offei
University of Education, Winneba-Ghana

Emmanuel K. Acheampong
University of Education, Winneba-Ghana

Abstract

Hearing screening in public schools is not common practice in developing countries like Ghana. Yet, the World Health Organization (WHO) (2012) reported that 90% of children with hearing problems live in developing countries. This study was conducted in a rural community in the Central Region of Ghana to find out (a) hearing problems among students in rural community schools, (b) accessibility to hearing screening facilities in rural communities, and (c) benefits mobile hearing screening services could bring to people in rural communities in Ghana. Two hundred forty students from a public high school that served about 7 neighboring rural communities were randomly selected for otoscopy examination and pure tone hearing screening tests. One hundred sixty-five of the students passed both otoscopy examinations and pure tone hearing screening tests while 75 of the subjects failed both tests. Recommendations made included regular school-based hearing screening for all students, and increased access to mobile hearing screening in rural communities.

Background

Hearing services are critical to maintaining and improving hearing and communication abilities (Blazer, Domnitz, & Liverman, 2016), but the degree of importance attached to the critical role that hearing-related services play in hearing health care is minimal (National Institute on Deafness and Other Communication Disorders [NIDCD], 2016). Hearing services include assessment of hearing and communication difficulties, diagnosis of medical conditions, evaluation of hearing loss and treatment needs, counseling, and many other services that help to improve a person's hearing and communication abilities. Green, Fryer, Yawn, Lanier, and Dovey (2001) explained that these hearing services are provided by different hearing health care professionals such as audiologists, hearing instrument specialists, otolaryngologists, primary care physicians, and others. Blazer et al. further explained that, in the United States, hearing health care services are expensive and time-consuming, and many individuals are unable to access hearing health care services because of the lack of information about those services.

It is estimated that, about 740,000 children are born annually worldwide with hearing loss or acquire permanent bilateral hearing loss within the first few weeks of life (Olusanya, 2015), and 90% of those children live in developing countries (Swanepoel, 2009). The prevalence of hearing impairment differs according to gender, with overall prevalence estimated to be 10.5 percent for males and 6.8 percent for females (National Center for Education Statistics, 2017). It would therefore be expected that more male students in schools would have hearing impairments.

Olusanya further explained that, unlike living in high-income countries, children living in developing countries typically do not receive hearing screening services at birth, and are not frequently screened for signs of hearing loss when they go to school. Hearing screenings in public schools are used to identify children who might have or could be at risk for having auditory disorders (Absalan, Pirasteh, Khavidaki, Rad, Esfahani, & Nilforoush, 2013; Levar, Loven, & Lucero, 2014). In 2012, the World Health Organization (WHO) estimated that 75 million people had auditory disorders (Boesen & Lykke, 2012; Offei, 2015), of which a sizeable percentage could be in children in school.

Hearing loss among children, for instance, is not rare; and if left undiagnosed, its impact on learning and even life trajectory may be devastating. In industrialized countries, screening for hearing disorders in childhood is a widespread practice (Gell, White, Mackenzie, Smith, Thompson, & Hatcher, 1992; Olusanya & Akinyemi, 2009), and may continue through high school. Unfortunately, it is not so in many developing countries (Offei & Yekple, 2014; Olusanya, 2015) due to several factors. For instance, McPherson (2008) concluded that hearing loss is not the highest priority for individuals in developing countries who have other health issues, such as life threatening illnesses or diseases. Furthermore, hearing impairment requires expensive rehabilitation options, so it is overlooked (Olusanya, 2007). Additionally, hearing healthcare services tend to be concentrated more in urban areas than rural areas of these countries (Swanepoel, Louw, & Hugo, 2007; Offei & Yekple, 2014). Offei (2005, 2015) cited inadequate facilities, inadequate personnel, tools and other equipment as some of the reasons for the limited hearing health care services available to consumers in a developing country like Ghana.

One of the more efficient ways to reach rural communities for hearing screening is through mobile hearing screening (Levar, Loven, & Lucero, 2001; McPherson, Law, & Wong, 2010). Mobile hearing screening is the practice whereby audiological services are delivered “on wheels” in communities rather than in a well set up urban audiological facility (Boesen & Lykke, 2012; Magian, Anderson, McKenzie, and Person (1976). Mobile audiology, significantly, facilitates early detection and intervention of educationally significant auditory problems (Levar et al., 2001). By providing basic ear/hearing services in rural communities, barriers to successful academic progress of several children would be removed and, would indeed, put smiles back on the faces of many children who suffer in silence (Dodd-Murphy, Murphy, & Bess, 1992).

Although, several studies, such as Magian et al. (1976), Gell, White, Newell, Mackenzie, Smith, et al. (1992), Levar et al. (2001), McPherson at al. (2010), and Boesen & Lykke (2012) have reported that mobile hearing screening in deprived communities is not new, it is a recent practice in Ghana (Offei & Yekple, 2014). Offei and Yekple further reported that the few mobile hearing screening facilities in Ghana are concentrated in three southern and mid-central metropolitan areas of the country, thus making those services inaccessible to consumers in the rural areas.

In Ghana, there are three audiology mobile vans, also called the Hearing Assessment and Research Klinik (HARK). One of those audiology mobile vans is located at the Komfo Anokye Teaching Hospital in Kumasi, which serves communities within and around the mid-regions of Ghana, namely, Ashanti and Brong Ahafo Regions. The second audiology mobile van is located

in Accra at the Korle-Bu Hospital Hearing Assessment Centre, and serves the Greater Accra Region and surrounding areas.

The third mobile van, which happens to be the newest, was a joint donation by the Rotary Clubs of Llanelli in Wales, and Labone-Accra to the Centre for Hearing and Speech Services in the Department of Special Education, University of Education, Winneba (UEW). This mobile facility serves communities within the Central and Western Regions of Ghana. The HARK at the Centre for Hearing and Speech Services at UEW has its own power generator, and is particularly useful for community mobile hearing screening, especially, since Ghana has been experiencing serious electric power crisis in recent times. Unfortunately, the Northern, Upper East and Upper West Regions of Ghana, which also have high incidence rates of children with educationally significant auditory disorders, do not have access to any of the HARKs.

Effective identification and appropriate intervention significantly affect the quality of life of children with disabilities and their families (Gell et al., 1992; Levar et al., 2001; Olusanya, Wirz, & Luxon, 2008)). In spite of efforts made so far toward providing hearing screening services for the majority of children in Ghana, the prospect of many children getting their auditory abilities tested and monitored early in life remains extremely limited (Offei, 2005; Offei, 2015). Although the incidence of ear and hearing problems has been documented extensively, school-age identification, early intervention and school-based services needed to overcome hearing problems of students are relatively nonexistent (Offei, 2013; Offei & Acheampong, 2014).

One of the factors that militate early and school-based identification of hearing disorders in Ghana is the lack of appropriate tools for testing and monitoring the auditory development of infants and children (Offei, 2013; Offei & Acheampong, 2014, Offei & Yekple, 2014). For instance, very few centers for screening are available to rural folks since most hearing screening facilities are located in cities and urban centers. Consequently, families that are poor, vulnerable or less privileged, and who tend to live in rural communities, are unable to access services provided at the screening centers. Specifically, families in rural communities often cannot afford the costs involved in travelling to the urban centers to screen their children or attend follow-up appointments. Instead, they resort to the use of untested local herbs and medicines, which then can cause additional problems (Offei 2005).

The issue of cost benefit is often raised when discussing whether or not mobile audiology should be the preferred practice to traditional center-based service delivery systems (Offei, 2015; Offei & Acheampong, 2014). For instance, data from the Centre for Hearing and Speech Services at the University of Education, Winneba, showed that the greatest number of clients screened per day at the facility was 20, but a mobile audiology screening unit potentially serves more individuals within their communities. In addition, the mobile audiology team would be able to interact with clients and their family members within their local settings, which in turn, could increase the chances of the mobile hearing team educating more rural community members about ear care, referral, and treatment options. Mobile audiology services, therefore, could be cheaper and more convenient, as clients and their families would pay little for transportation, registration, consultation, and education.

Studies about hearing screening in Ghana have mainly addressed screening during infants and childhood, but we suspected that there could be adolescents and young adults who had never been screened for hearing disorders, and who would not have the opportunity of getting screened for hearing problems. The present study was therefore conducted to find out (a) the types of hearing problems found in students in a rural community high school, (b) the prevalence rate of hearing impairments by gender, and (c) benefits of mobile hearing screening on a rural community schools.

Method

Participants

The participants were 240 final-year students (103 males and 137 females) from a community high school that served about 7 neighboring rural communities in the Central Region of Ghana. The mean age of the subjects was 18.9 years with a standard deviation of 1.1. The school, which is one of Ghana's public co-educational senior high schools, has a population of over 700 students and offers coursework in general science, general arts, home economics, visual arts, and business.

Final-year students were selected for the screening exercise for two main reasons. First, they were preparing to write their exit examinations, and that would most likely be the last opportunity for them to get their hearing screened before exiting high school. Second, the exit examination included Oral English, a test which involved listening to a voice recording on a CD and responding to questions. Students, who had hearing loss of either a conductive or sensorineural nature, even when mild, as well as those with unilateral one-sided hearing loss, could typically find it difficult to listen in noise. Unfortunately, many classrooms in Ghana are not suitable for oral tests such as "oral English" because they are generally noisy and are not properly acoustically treated. Preliminary analysis of the participants' responses to a pre-screening survey indicated that none of the participants had ever had their hearing screened.

Setting

The mobile screening van (the HARK) was used for pure tone testing. The van is built in such a way that it is partly sound-proof, averaging 23dBA of ambient sound level. A relatively quiet room on the compound with an average ambient sound level of 20-25dBA was selected for the hearing test. A sound level meter was used to measure the sound level in the room every 15 minutes during to validate our recordings.

Questionnaire

The participants completed a 10-item questionnaire on the students' and their families' hearing medical history, accessibility of hearing screening in their communities, and their average scores in Oral English, Mathematics, Economics, Biology, Science and English Literature.

Table 1. *Distribution of participants from the seven communities*

	Students		
Community	Males	Females	Total
Community 1	15	18	33
Community 2	18	22	40
Community 3	12	23	35
Community 4	13	20	33
Community 5	16	15	31
Community 6	15	19	34
Community 7	14	20	34
Total	103	137	240

Procedure

The first author was a Carnegie fellowship scholar in Ghana when the study was conducted. The screening included otoscopic examination, pure tone audiometric testing, and cerumen management procedures. The Siemens HearCheck screener with disposable ear cups and a portable hand-held screening audiometer were used for pure tone screening, while the Heine Otoscope was used for the outer ear examination (otoscopy). Otoscopic examinations were the first test to be done after which the students completed the HearCheck screen. Otoscopic examination was conducted outside a quiet office. Students who passed the otoscopic test (ear canals clear, no sign of infection, tympanic membrane visible and healthy looking) went for the HearCheck screen. Students who subsequently passed the HearCheck Screen were discharged. Students who failed the HearCheck screen were referred to the UEW Centre for Hearing Science for pure tone audiometric testing and further management. Students who failed the otoscopic examination were referred for an appropriate management - ear wash or treatment for ear infection.

Figure 1 shows the procedure for hearing testing.

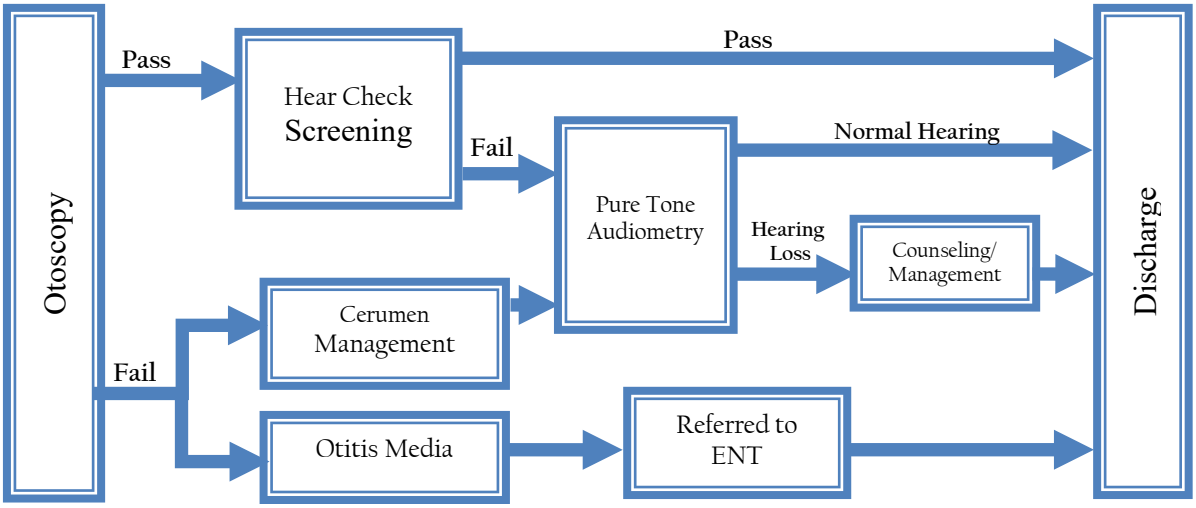

Figure 1: *Hearing test procedures*

Results

Analyses of the screening data showed that out of the 240 students screened, 165 (68.75%) students, comprising 57 males (23.75%) and 108 females (45%), passed both the otoscopy examination and pure tone hearing screening, and therefore needed no further interventions. However, 75 (31.25%) of the students failed both tests. Specifically, 55 (22.91%) of the students had impacted cerumen/wax in either one or both ears, 16 (6.6%) of the students failed the pure tone hearing test and 4 (1.74%) of the students had middle ear infection. The results are presented graphically in Figure 2. Overall, the percentage of male students who failed the screening tests was higher than their female counterparts. Specifically, 26 (25%) of the male students and 29 (21%) of the female students, respectively, had hearing difficulties resulting from impacted wax conditions, while 9 (8.7%) of the male students and 7 (5.1%) of the female students, respectively, failed the pure tone screening test, and 2 (1.9%) of the male students and 2 (1.4%) of the female students, respectively, had ear infections.

Students with cases of impacted cerumen had the wax removed and those with middle ear infection were referred to ENT specialist for further attention.

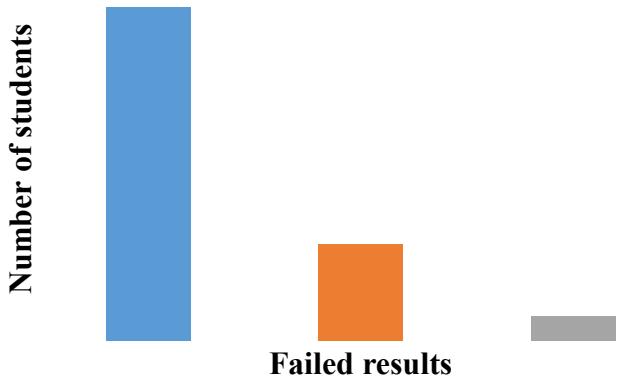

Figure 2:
Details of failed results

Additionaly, analysis of the data of the students who undertook the pure tone audiometry after failing the HearCheck screening indicated that 4 had unilateral hearing loss in either the left ear or right ear, and 16 had bilateral hearing loss of varying degrees. Of this number, 16 had mild sensorineural hearing loss, 9 had moderate hearing loss and 4 had profound sensorineural hearing loss. Figure 3 is the graphical representation of this distribution.

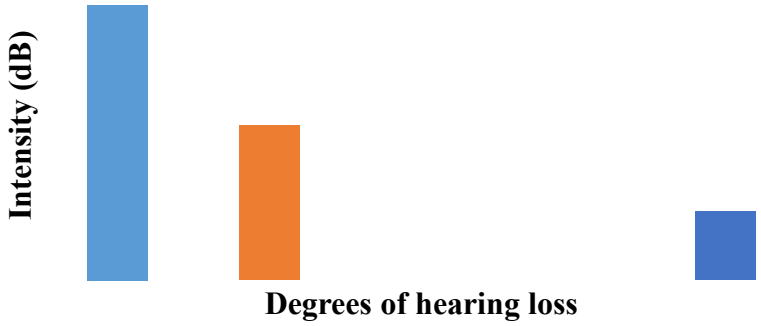

Figure 3: *Degrees of hearing*

Table 2. *Failed results by community*

Community	Impacted wax		Pure tone		Infection	
	Males	Females	Males	Females	Males	Females
Community 1	4	5	2	0	0	1
Community 2	2	5	1	2	1	0
Community 3	6	4	0	1	0	1
Community 4	5	3	2	1	0	0
Community 5	2	2	1	0	0	0
Community 6	4	6	2	2	0	0
Community 7	3	4	1	1	1	0
Total	26	29	9	7	2	2

Analysis of the Questionnaire

The analysis of participants' responses to the 10-item questionnaire indicated that, to the best of their knowledge, none of them or any member of their family (including parents and siblings) had had a hearing screening test prior to the time of the study. It was found that 6 of the students who failed the pure tone test had problems with English Language, 7 students had problems with Mathematics, 3 students had problems with Economics, Biology, and Science, respectively, and one student had problems with English Literature. It appeared, however, that some of the students had problems with comprehension and not necessarily hearing. This could be due to other teacher/student/environmental factors. For instance, it could be that some of the students in this category showed a hearing loss (per Pure Tone Average –PTA) resulting from uncontrolled classroom environment, and this might have significantly affected the test results. Another reason could be that they were borderline cases (mild) and those with unilateral hearing loss (one-sided). One of the challenges of one-sided hearing loss is the difficulty to locate the source of sound (problem when the sound source is in the direction of the deaf ear) or difficulty listening in noise (noisy classrooms as found in Ghana). It would be difficult to predict with certainty whether or not students would be able to perform well on oral English exam, which would require them to respond to unfamiliar recorded voices.

One student with a significant bilateral hearing loss could not hear well and this was evident across all coursework. The student struggled in the class, but it appeared that teachers and non-teaching staff were not aware of the student's problems. The student indicated that he relied on friends for support who sometimes did not explain things well, or might have been impatient with the student. In this student's situation, the mobile hearing team thought that a hearing aid would be most useful. For those with unilateral cases, the team recommended to teachers to consider more appropriate seating arrangements. For instance, in one case the team observed a student who was asked to sit very close to the window in class with his better ear toward the window and the deaf ear toward the class. An immediate change of his seating was recommended to enable the student to benefit from instruction in the classroom.

Conclusions

A mobile hearing screening conducted in one community high school provided a team from a university-based center for hearing science an opportunity to screen 240 students from seven communities in about six hours, something that was impossible to do at a center-based clinic. As a result of what was achieved from the free school-based mobile screening at the rural community high school, we recommended to educational administrators in the region to ensure that school-based hearing screening be made available to all students, at least once every school year. Secondly, the team decided to conduct follow-up screenings and other educational activities for students identified as having a hearing disorder and/or hearing loss. Thirdly, we recommended that community awareness on ear-care, signs of hearing problems, and referral to qualified health care personnel be vigorously organized for rural communities in the Central Region of Ghana. Fourth, community leaders and the screening team decided to involve not-for-profit organizations and the Ghana Education Service to provide assistive devices to students with hearing impairments. Finally, considering the evidence supporting the positive impact of the HARK on the lives of families living in communities that have had access to services delivered through it, efforts should be made to extend mobile hearing screening services to the Northern, Upper East and Upper West Regions of Ghana, as well.

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About the Authors

Anthony Mensah Denkyirah (Ph.D.)
Anthony Denkyirah teaches special education courses in the Department of Teaching and Learning at Southern Illinois University Edwardsville (SIUE), IL USA. He received his bachelor's degree in special education from the University of Cape Coast-Ghana in 1985, and a master's degree (1995) and PhD in special education (2003), respectively, from Southern Illinois University Carbondale, IL USA. In the summer of 2015, Dr. Denkyirah spent three months at the University of Education Winneba (UEW) in Ghana as a Carnegie African Diaspora Fellowship Scholar to support UEW faculty in curricular development activities for transition planning programs for students with special needs, single systems research design strategies and parental involvement in special education and community-based rehabilitation.

Yaw Nyadu Offei (Ph.D.)
Dr. Yaw Nyadu Offei is an audiologist and a senior lecturer in the Department of Special Education at the University of Education Winneba (UEW). He received his bachelor's degree in special education from UEW (1998), a master's degree from Universality of Cape Coast–Ghana (2003), a master of science in audiology from the University College, London, UK (2006) and a Ph.D in audiology from University of Cologne, Germany (2013). Dr. Offei is currently the director/coordinator for the Center for Hearing and Speech Services at UEW and teaches undergraduate and graduate courses in audiology, and the education of learners with deafness and hearing impairments.

Emmanuel Kwasi Acheampong
Emmanuel is a lecturer in the Department of Special Education, University of Education, Winneba. He holds a bachelor's degree and a master of philosophy degree in special education from the University of Education, Winneba (UEW), and is currently pursuing a PhD at the University of Cape Coast in Ghana. Mr. Acheampong was formerly coordinator for the Center for Hearing and Speech Services and now heads the Community-Based Rehabilitation and Disability Studies program at UEW. His teaching and research interests include preparation of personnel for the education of children with hearing impairments and professional practitioners in community-based rehabilitation, aural rehabilitation, deafness and early intervention studies, school-based screening services, and audiological service delivery within health and educational settings.

An Investigation of Special Education Preservice Teachers' Perspectives and Practices of STEAM Education

Ashley Gess, Ph.D.
Augusta University

Nai-Cheng Kuo, Ph.D.
Augusta University

Abstract

Science, Technology, Engineering, Arts, and Mathematics (STEAM) education is an instructional approach whereby teachers intentionally construct design-based learning opportunities to help students learn and apply content knowledge across disciplines in real-life situations. The present study investigated how twenty preservice teachers in a university special education program perceived STEAM education and how they applied STEAM education in the K-12 classroom after a series of trainings and embedded experiences. Results indicate that continuous support in STEAM education is still needed to help preservice teachers move from positive perspectives toward STEAM education to effective practices in the K-12 classroom.

Keywords: special education, STEAM education, teacher education, K-12 classroom

An Investigation of Special Education Preservice Teachers' Perspectives and Practices of STEAM Education

Introduction

The technological improvements, scientific discoveries and engineering solutions that continue to transform our society impress an urgent need for education to teach life skills for students to become productive citizens (Bybee, 2013; Spillane, 2014; Zollman, 2012). Beginning in the early 1980's, the Excellence Reform Movement ushered in a new era of renewed focus on the teaching and learning of science, technology, engineering and mathematics (STEM) content.

Despite widespread efforts to affect meaningful educational reform toward societal literacy through integrative STEM education, the results have been lackluster at best (Wells, 2008). As a result, many US citizens remain ill-equipped to make thoughtful decisions and to think critically and creatively about the use of technology as well as to employ a full range of cross-cutting skills and knowledge in daily life (Dugger, Meade, Delany & Nichols, 2003; National Academy of Engineering & National Research Council, 2002; National Research Council, 2013).

Recently, STEM educational mandates became more inclusive in scope by requiring evidence of educational growth for *all* students toward the production of a literate society (Bybee, 2013; Handelsman & Smith, 2016). Regardless of race, class, economic status, or dis/abilities, each and every student must have the opportunities to realize their academic and personal potential. However, STEM fields largely remain out of reach for women, minorities, and those with

dis/abilities (Handelsman & Smith, 2016; Hwang & Taylor, 2016; Posner & Patoine, 2009). In order to address this inequity, and in keeping with identified gaps revealed by educational research, the U.S. government prioritized three areas for improvement: improving STEM teaching, improving access to rigorous STEM courses, and intentionally improving access to STEM learning for all students (Handelsman & Smith, 2016). When considering the above-referenced priorities, the centrality of the teacher is obvious. Preparation must include, but not be limited to deepening the teacher's content knowledge (CK), pedagogical knowledge (PK), pedagogical content knowledge (PCK) (Shulman, 1986, 1987), and technological pedagogical content knowledge (TPCK) (Koehler & Mishra, 2008) with teachers engaging in communities of practice that support educational transformation (Darling-Hammond & McLaughlin, 2011; Shulman & Shulman, 2004).

Integrative STEAM education

It is important to note that both artists and engineers engage in the process of design in order to make meaning and develop understanding. Artistic design and engineering design are parallel processes in inquiry (Gess, 2015) and, for this reason, an integrative approach to STEM education may be expanded to integrative STEA(arts)M education (Bequette, & Bequette, 2012; Daugherty, 2013; Yakman, 2010). Recognizing that the addition of arts results in increased motivation, engagement, achievement within STEM disciplines (Becker & Park, 2011) and learning among STEAM disciplines (Henriksen, 2011; Henricksen & Mishra, 2013), lawmakers advanced H.Res. 51 to "develop a STEM to STEAM Council in order to facilitate a comprehensive approach to incorporate art and design into federal STEM programs" (H. Res. 51-113th Congress, 2013-2014).

Integrative STEAM education utilizes approaches that explore teaching and learning between/among any two or more of the STEM subject areas, and/or between a STEAM subject and one or more other school subjects (Sanders, 2009). This approach has been shown to "provide scaffolding for future learning, to aid in transfer of knowledge and skills, and to demonstrate to students the applicability of their learning in the real world" (Spillane, 2014, p. 1). By definition, the integrative approach encourages the intentional combination of the content and practice of STEAM disciplines and encourages further integration with other disciplines. "The term 'integratIVE' implies an ongoing, dynamic, learner-centered process of teaching and learning distinct from 'integratED', which connotes a static, completed, teacher-centered process" (Wells, 2013, p. 29). At the heart of this approach is the design process, which may be employed in the classroom to "connect hands-on with minds-on , where hands-on experiences are intentionally utilized to achieve minds-on learning outcomes" (Wells, 2016). Thus, the effective teacher will have command of STEAM content knowledge (CK) as well as STEAM pedagogical content knowledge (PCK) and STEAM technological pedagogical content knowledge (TPCK) that is founded in the ideation, creation and employment of authentic design tasks in order to engage all students. In other words, the focus on the process of learning becomes paramount in the classroom as students engage their minds in the activity of designing. All students may gain knowledge and understanding through participation in design and reflection of the process (Cross, 2001).

The design tasks of STEAM education are commonly situated around authentic, real-life situations and activities are tackled in groups, thereby capitalizing on the individual knowledge

and experiences that each student brings with them to the class. Allowing students to demonstrate understanding through either engineering or artistic applications will increase motivation for students who have historically been unsuccessful in content-heavy disciplines that are traditionally associated with STEM (Posner & Patoine, 2009). Through working with preservice teachers in the field of special education, the present study investigated how twenty preservice teachers in a university special education program perceived STEAM education and how they applied STEAM education in the K-12 classroom. The research questions that guided the study are:

1. How do preservice teachers perceive STEAM education after intentional exposure to it through a STEAM workshop and/or a STEAM site visit?
2. How do preservice conduct STEAM lessons in the K-12 classroom after the intentional exposure to STEAM education?
3. How do preservice teachers perceive STEAM education after conducting STEAM lessons in the K-12 classroom?

Methods

Data Collection

The data were collected from twenty preservice teachers in a university teacher preparation program after obtaining Institutional Review Board approval. The university utilized a professional development school (PDS) model whereby students participated in eleven weeks in classes on campus and five weeks of field placement in K-12 partner schools each semester. Since the students are specializing in special education (SPED), their placement may be in any grade level (K-12). Among the participants, eleven participated in two consecutive semesters (Fall, 2016 and Spring, 2017), three participated only in Fall and six participated only in Spring. Participant demographic information may be found in Table 1.

Table 1
Participant demographic information

Pseudonym	Gender	Ethnicity	Employed in school as a para-educator	Semester Participation
Angie	Female	Caucasian	No	Fall and Spring
Barbara	Female	Caucasian	Yes	Fall and Spring
Bonnie	Female	Caucasian	No	Fall and Spring
Becky	Female	Caucasian	No	Fall and Spring
Cindy	Female	Caucasian	No	Fall and Spring
Charles	Male	Caucasian	Yes	Fall and Spring
Elizabeth	Female	Caucasian	No	Fall and Spring
Fiona	Female	Caucasian	Yes	Fall and Spring
George	Male	Caucasian	No	Fall and Spring
Katy	Female	Caucasian	Yes	Fall and Spring
Sally	Female	African American	Yes	Fall and Spring
Conner	Male	Caucasian	No	Fall Only
Leslie	Female	Caucasian	No	Fall Only
Mary	Female	Caucasian	No	Fall Only
Bella	Female	Caucasian	No	Spring Only
Lucy	Female	African American	No	Spring Only
Lisa	Female	Caucasian	No	Spring Only
Octavia	Female	Caucasian	No	Spring Only
Sarah	Female	Caucasian	No	Spring Only
Wally	Male	African American	Yes	Spring Only

Note. Among the twenty preservice teachers, four were male and the rest were female. Three were African American and the rest were Caucasian. Six students were employed as para-educators and the others were not employed in the school system. Eleven students participated in both Fall and Spring semesters, three students only participated in the Fall semester, and seven students only participated in the Spring semester.

Workshop. Early in Fall 2016, preservice teachers read three peer-reviewed, published articles (2013) about STEAM education, in order to increase their awareness of an integrative STEAM and to familiarize them with the idea that STEAM education can be an effective pedagogical approach for all students, including those with disabilities. In the middle of each semester, preservice teachers participated in a 3-hour integrative STEAM education training workshop. At the beginning of the workshop, students were asked to respond to two direct questions concerning their knowledge and understanding of STEAM educational approaches to teaching and learning. During the 3-hour workshop, preservice teachers learned about the advantages and challenges of implementing STEAM education as well as how to design STEAM lessons for K-12 learners. At the end of the workshop, participants were again asked to respond to the same questions used in the pre-workshop survey.

STEAM Site Visit. In order to deepen understandings, preservice teachers were given an opportunity to observe a leading model of a STEAM school in Savannah, GA, where they took a full school day to observe classes in session and talk with students, teachers and administrators. The activities during this site visit included welcome and introductions, a tour of applications, small group rotations in classrooms, Q&A with students, Q&A with 6th grade teachers, and a wrap-up session. Preservice teachers were asked to anonymously reflect in writing on the experiences of the day, giving special regard to their perceptions of the advantages and challenges of the approach.

Teaching Reflection Journals. After the workshop, field observation, and follow-up meetings, preservice teachers planned and taught at least one STEAM lesson during each PDS placement. Preservice teachers shared their experiences relative to incorporation and implementation of STEAM education in the classroom in order to participate in an open discussion about their experiences, as modeled in the workshop. Finally, preservice teachers reflected, in writing, on their practice and their peers' feedback. After submission, professors contributed feedback about each preservice teacher's lesson plans, teaching, and reflection paper. The reflection questions included but were not limited to:

- Barriers and needs to persist in using STEAM education?
- Benefits to STEAM education?
- Challenges of incorporating STEAM education?
- What are your perceptions with regard to STEAM education?
- Is the integrative STEAM approach appropriate for SPED teacher candidates?
- Describe your collaboration with your clinical teacher with regard to STEAM education.

Instrumentation and Data Analysis

To investigate preservice teachers' perspectives of using STEAM education, our instruments included feedback forms and reflection papers. For the feedback forms, we used open-ended questions to obtain all possible answers that participants found relevant to the STEAM workshop and the site visit. In the Fall, we asked the participants to share what they knew about STEAM education, in writing, before and after participating in the workshop. In the Spring, we again asked participants to share their impressions of the site visit and their thoughts about STEAM education.

Feedback on the workshop and the site visit as well as reflection papers were analyzed to reveal understanding about participants' perceptions. We used a qualitative content analysis method (Hsieh & Shannon, 2005) to code emerging themes derived from the raw data. We then synthesized and refined the themes based on the relevance of the information and generated a coding book.

To inform teacher educators as to the impacts of the workshop and/or site visit in changing teacher planning, STEAM lesson plans were evaluated for evidence of essential elements of STEAM education. Specifically, plans were evaluated for evidence of the use of a real-life "driving question" (Krajcik & Mamlock-Naaman, 2006) to guide the lesson, elements of the design process, co-listed multidisciplinary standards, and evidence of interdisciplinary applications. Presence or absence of the above elements were documented in order to give a quantitative representation of the result for each lesson plan. Although participants were not limited to use any particular lesson plan template, they all chose the template that they routinely use in their program for mock edTPA. Thus, the use of this template prompted the inclusion, at a minimum, of learning goals, measurable lesson objectives, planned supports, common core standards related IEP goals or IEP objectives, accommodations and modifications, communication skills, resources and materials, introduction, the body of the lesson, closure, and assessments in all lessons. To evaluate the alignment of lesson plans with STEAM education, we modified an instrument previously developed by Wells, Wells & Deck (2015). A summary of the instruments and data analyses in the present study is shown in Table 2.

Table 2
An overview of the research questions, instruments, and data analysis

Research Questions	Instruments	Data Analysis
1. How do preservice teachers perceive STEAM approach after intentional exposure to it through a STEAM workshop and/or a STEAM site visit?	Preservice teachers' written feedback: 1. Workshop (Code: Participant pseudonym). 2. Site visit (Anonymous feedback, Code: Participant A, B, ...Q).	Qualitative content analysis
2. How do preservice conduct STEAM lessons in the K-12 classroom after the intentional exposure to STEAM education?	Pre-service teachers' reflection papers (Code: Participant pseudonym)	Qualitative content analysis
3. How do preservice teachers' perceive STEAM education after planning conducting a STEAM lesson in the inclusive classroom?	Preservice teachers' reflection papers (Code: Participant pseudonym)	Qualitative content analysis

Results

1. How do preservice teachers perceive STEAM education after intentional exposure to it through a STEAM workshop and/or a STEAM site visit?

Pre-workshop: Before coming to the workshop, participants were asked to read three STEAM articles that were published in a top, peer-reviewed practitioner journal in special education – *Teaching Exceptional Journal*. It was our intent that participants would garner some basic knowledge of the general idea and goals of STEAM education before coming to the workshop. On the pre-workshop questionnaire, participants' answers focused on relating what STEAM education *is*, rather than what STEAM education *does*. The majority (7/12) participants described their understanding of STEAM education by simply spelling out the acronym of STEAM: Science, technology, engineering, arts, and mathematics. Three participants articulated that in a STEAM class, the teacher should "integrate STEAM disciplines into the lessons - combining them" (Bonnie). One participant interpreted the STEAM acronym as indicating that the teachers should be sure there is "time set aside for each class"(Mary). Another participant advocated for the use of each STEAM discipline "to help participants understand the world and develop critical thinking" (Katie). Finally, 100% of participants shared that they had never used STEAM in the classroom or been taught about STEAM education.

Post-Workshop: After the workshop, participants were again asked to articulate their thoughts about STEAM education. Their responses were much more varied but about half of the responses again articulated impressions of what STEAM education is and the other half focused on what STEAM education does. For example, participants described STEAM education as "a teaching approach" that is "responsive", "inclusive" and "relevant". Three participants decided that STEAM education was when "all STEAM disciplines are taught and tested together." Eight participants used "integrative" and five used "collaborative" when discussing STEAM education. Participants also described STEAM education for what it does in the context of the classroom: "fostering habits of mind", "moving participants forward" and "helping participants engage the world through critical thinking and analysis." Finally, three participants articulated that this teaching approach would improve educational access for all students with and without disabilities.

STEAM Site Visit: We grouped participants' anonymous feedback on the STEAM site visit into four categories: 1) the environment, 2) the school administrators, 3) the teachers, and 4) the participants (see Table 2). In terms of the environment, most participants described that the learning environment was respectful and positive. School administrators, teachers, and students were proud of what they were doing and they held each other accountable. For example, Participant K stated:

> *I enjoyed the pride and knowledge that students, teachers, and administrators showed for the school. I have never been in a middle school with so much respect and understanding for one another. The teachers have so much freedom within their classes, which shows to facilitate harder work from the teachers, harder work which translates to the students working harder.*

Participant Q concurred when he said:

> *The relationship between student-student, student-teacher, teacher-teacher, and teacher-administration is amazing. Everybody was humble and polite...The kids were very confident in their work as well as the teachers' confidence in the students. The school presented a relaxed environment, which was improved by the flexible seating and the lighting in the classrooms.*

Several participants discussed that this successful and harmonious teaching and learning environment could happen because of the level of the teamwork and communication as well as school climate. The STEAM school cultivated each school member's ownership and responsibility for his/her work. The autonomy and independence reduced the likelihood of problem behaviors in the classroom. In terms of the school administrators, participants were impressed by the principal's leadership, personal skills, and empowerment. He actually cared about the students' and the teachers' well-being and made teachers and students very comfortable and proud to be a part of this school. Participant H stated that "the principal is an amazing and awesome human being. The only person I have ever seen to love and respect his staff and students with the highest esteem." The classrooms had different but equally engaging styles of teaching. In terms of teachers, teachers were excited about what their students were doing. Teachers acted more like facilitators than leaders. They established a respectful and trustful relationship with their students. They guided students' to explore knowledge and to express their own thoughts confidently. For instance, Participant C said,

> *Academic engagement was off the charts. I didn't seen one student that was off task in any class that I went into. The confidence students exuded was remarkable. They were sure of themselves, knew who they were and what they liked, and could convey that. Students not only directed, but led instruction. In fact, I don't think I saw a teacher standing in front of the class with a PowerPoint at all. Depth of knowledge was amazing. To hear 7th graders talk about the harmful effects of pesticides and animal feeding behavior in explicit, accurate terms was incredible.*

The great relationships existed not only between teachers and their students, but also teachers and teachers. Each teacher was approachable and supportive to each other to maximize students' learning. Teachers were willing to come to the school earlier and stay longer to help students catch up with tasks. In terms of students, due to the student-centered frame as well as good relationships among peers and teachers, students seemed excited to be at school and enjoyed coming to school every day. Moreover, students willing to work with teachers, share their ideas, and offer advice to teachers and the school. Participant E stated:

> *It was interesting to see how the students worked professionally with each other...One major note that touched me was when the students said that they actually liked coming to school. As a person who never really liked school, I want to ensure that students look forward to coming to school. It is very cool and interesting that students are working on real-life projects.*

Because students were encouraged to explore knowledge, find the meaning of their projects, and

elaborate their thoughts, many students had developed remarkable confidence, respect and inclusivity, communication skills, and team efficiency. Participant G said, "The communication amongst students was a sight to see. They were always collaborating and never denouncing an idea that someone has come up with." Participant F also shared a similar thought: "I was very impressed when I discovered that in one class, students would design a robot and then send digital plans to be completed. The students' peer-to-peer and peer-to-adult skills were also extremely impressive." While the STEAM site had diverse learners from different cultural backgrounds, participants were hoping to see more students with special needs being involved in such a positive learning environment.

Overall, the STEAM site visit was mind-blowing to many participants who had received most of their education in the teacher-directed classroom. By visiting the site, STEAM education became more concrete and doable to them. The school promoted a dynamic student-centered education that focused on real-life situations for all students. Personal satisfaction across school administrators, teachers, and students were evident in the interviews, observations, and practices.

2. How do preservice teachers conduct STEAM lessons in the K-12 classroom after the intentional exposure to STEAM education?

Lesson planning. In the Fall, 40% of the participants discussed science and thirty five percent listed English-language arts (ELA) in their STEAM lesson plans. Among them, 30% explicitly listed science objectives and 20% listed ELA objectives when planning. Mathematics was discussed by 25% of Fall students but only 20% actually listed mathematics objectives. All other disciplines (technology, art, engineering, social studies) were discussed and explicitly listed by ten percent or fewer students. In the Spring, 35% of the participants listed science and the same percentage listed ELA and explicitly listed these objectives in their plans. More telling is the number of times that the subjects were actually co-listed in the same lesson plan, thus evidencing efforts toward integrative approaches. For the Fall semester, 36% of students discussed teaching using more than one standard across subject matters in their lessons and 79% explicitly aligned the standards to reflect that intention. In the Spring, the same percentage of students discussed teaching using more than one standard across subject matters in their lessons and 88% explicitly aligned the standards to reflect this intention. When planning in the Fall, 54% of students chose to include science in the STEAM plans and 36% chose to include math and/or ELA. In Spring, 44% of students chose to include science and 40% chose to include math and/or ELA. Finally, the data did not reveal a preference as to which subjects students most often placed together in plans.

Assessment. In the Fall, 92% of the participants planned to test only one subject, regardless of the standards listed. In the Spring, 56% of the participants planned to assess only one subject, but 44% attempted to test all subjects included in the standards. All Fall participants designed assessments to test knowledge level information. In the Spring, two participants planned on using a more integrative assessment that incorporated some design and higher-order thinking beyond knowledge level.

Science and ELA were most often represented, followed by math. Seven participants in the Fall versus two participants in the Spring used sub-questions to drive their instruction. Only two

participants in the Fall used driving questions, and none of the participants in the Spring used driving questions. Participants who used science were more likely to list standards in their lesson plans, and that was true in both semesters. 13 out 15 in the Fall confined instruction to facts; 12 out 15 in the Spring were concerned with facts; higher-order thinking skills were absent from the lessons. We saw no evidence in promoting students' thinking or designing process.

3. How do preservice teachers' perceive STEAM education after conducting a STEAM lesson in the inclusive classroom?

Post lesson reflections focused on the benefits and challenges of STEAM education. Constant comparative analysis revealed eight emerging themes across two semesters with regard to benefits: authenticity, literacy, engagement, inclusivity, family/community, knowledge transfer, teacher collegiality/collaboration, and student empowerment/self-efficacy. Additionally, for the same period of time, five themes emerged as participants' perceptions of challenges for implementing STEAM education. Table 3 provides a list of themes and a brief explanation of each.

Table 3
Coding results

Level 2 Code	Level 1 Code	Description
Benefits	Authenticity	In order to express authentic experiences, preservice teachers referred to lessons that were relevant, hands-on, and experiential.
	Literacy	References to student development of skills such as problem solving and critical thinking.
	Engagement	Students' meaningful interactions with the learning or lesson.
	Inclusivity	Responses include language about all students being actively involved in the lesson/learning.
	Family/Community	Preservice teachers spoke about the explicit lesson connections to students' families and/or communities.
	Knowledge Transfer	Responses that discussed students' use of learned material in more than one context, either in or out of school.
	Teacher collegiality/collaboration	Preservice teachers made specific references to the need for and/or appreciation of explicit collaboration between in-practice and novice teacher as a necessary part of implementation of STEAM educational approaches.
	Student empowerment/self-efficacy	Explicit expressions of improved teaching confidence as a result of planning and/or implementing STEAM educational lessons.
Challenges	Content Knowledge (CK)	Preservice teachers spoke about their collaborating teacher's need for deeper understandings in content knowledge in order to effectively implement STEAM educational opportunities in the classroom.
	Pedagogical Content Knowledge (PCK)	References to participants teachers who had never heard of STEAM or STEAM education or who had not received training in integrative practices.
	Technological Pedagogical Content Knowledge (TPCK)	Preservice teachers referenced use of software to create reports or to play games. No mention of using technology to design or creating technological outputs such as, but not limited to, creation of apps

		or use of computer-aided-design tools (CAD).
	Support	Preservice teachers spoke about the need for support outside of the collaborating teacher and/or family such as (but not limited to): funding, school and district administration, and teaching time.

Benefits

Authenticity. After planning and teaching a lesson, participants overwhelmingly concluded that their efforts brought authenticity to classroom learning opportunities. Fall participants reported learning being given a "purpose" (Cindy) with explicit opportunities to apply learning in a "real world" or "real life" situation (Barbara). Participant Barbara went further to explain:

> *Science concepts, reading concepts, and math concepts were all integrated into one lesson. I feel as though this demonstrates real life for the children. On an everyday basis, we have to use all of these skills to solve problems … helps to wire their minds to use knowledge across the board to solve a problem. Instead of the traditional way, in which teachers try to segment the children's brain in not only solving math problems… Helps students to use all aspects of their knowledge to solve a problem instead of focusing on one single topic at one time.*

Other preservice teachers also asserted that in order for students to be able to "generalize what they are learning" engaging content through a STEAM approach gives a "way for students to see how lessons and skills learned in school can be used to answer many of life's big questions" (Mary). Spring participants referred more often to their observations at the STEAM school than their own lessons when referencing authenticity. For example, when referring to a discussion with a STEAM student, Mary said: "Students need to feel like they are valued and that what they are doing actually makes a difference or is relevant to real life".

Participants often paired the theme of authentic learning with the idea of necessary skills and abilities for each student to acquire through schooling. These preservice teachers highlighted their observations that through the application of important skills into the authentic context students tended to demonstrate skills that are associated with improving literacy such as, but not limited to, persistence, collaboration, communication, thinking critically and thinking analytically. For example, Cindy stated:

> *Students need to learn that failure is a good thing and that they can in fact benefit from it in life...students will most likely be working in groups…in lessons like this, students begin developing people skills, how to communicate well with others, work in a group efficiently, and collaborate within their group with making decisions or how to overcome obstacles...Students learn a lot about themselves as well and where they will benefit most within society.*

Literacy. One main goal of a STEAM educational approach is to promote a literate society. Students in both semesters identified learning outcomes that are associated with 21st century skills as potential results from engaging students in STEAM lessons. In the Fall, Cindy said:

> *Students need to learn that failure is a good thing and that they can in fact benefit from it. … Math is not something simply by itself, neither is science, technology, art, etc. STEAM teaches students to take advantage of what other subjects have to offer. In STEAM lessons, students will most likely be working in groups…allowing them to begin developing people skills, teaching them how to communicate well with others, work in a group efficiently, and collaborate within their group with making decisions or how to overcome obstacles…Students learn a lot about themselves as well and where they will benefit most within society.*

Elizabeth echoed the sentiments of her colleague, saying that "Children who have been introduced to STEAM education early in their education would score better ….dig deep and think critically." In the Spring, other students articulated similar sentiments. Wally said that STEAM lessons "promoted functional everyday living skills" and Sarah said that "students also learn how to manage their time wisely and how to work with others in a group". Lisa, in discussing STEAM education, went further:

> *STEAM lessons require students to read, think, analyze and apply what they have studied. Students that need to build on their social skills are also helped when the teacher follows and supports the characteristics of persistence, communication, creativity and collaboration that these types of lessons require.*

Engagement. In addition to STEAM type lessons being more authentic and supportive of student literacy, participants talked at length about the lessons being opportunities for students to be interested and engaged in the learning. Participants conveyed this sentiment by describing lessons that were "fun", "exciting", "interesting", "hands on" and "engaging." Fall participants reported their students "talking to me about what they smelled, saw and felt" (Becky), and "being more excited" than normal in class (Barbara). Another participant excitedly wrote that "The day after I implemented my lesson plan, a student approached me and asked a few questions in regards to pesticides" (Angie). One participant reported that his/her cooperating teacher said "she had never seen her class so engaged before" (Mary). Several participants concluded that in a STEAM school, students will develop motivation to come to school and will be more motivated to learn. Spring participants also specifically mentioned the potential of STEAM education to meaningfully engage students with disabilities. "Special education students need options in order to learn to the best of their ability and the STEAM approach gives the students multiple subjects to take from to be able to learn" (Mary).

Inclusivity. Many Fall participants articulated perceptions that an integrative approach to lessons can specifically improve education for all students. In a STEAM lesson, "students will most likely be working in groups versus individually" (Cindy) and George, after articulating the same sentiment, went on to say that "teaching with a STEAM approach allows teachers to fully promote the use of differentiation allowing the students to develop ways of learning that are more specific and beneficial for them individually." Conner agreed, saying that STEAM

approaches can "give students multiple ways of learning the same information."

Spring perceptions were similar to those from the Fall. Octavia recounted "When I did the STEAM activity, I noticed that all of the children, no matter the level of their cognitive and developmental delays, were able to enjoy and learn something from the activity." Wally relayed similar perceptions when he concluded that a significant part of a STEAM approach to teaching allowed him to "differentiate teaching in a way that makes learning interesting for all those different kinds of personalities and disabilities teachers might encounter." Finally, Angie articulated:

> *The STEAM approach gives me the ability to differentiate instruction by capitalizing on each student's strong point … to incorporate in the lesson. For example, if a student struggles in science, but does well with hands on activities, the teacher should use this to an advantage and incorporate the arts into the science lesson.*

Family/Community. No participants made discernable references to Family and/or Community impacts or participation in the Fall semester. However, after visiting the STEAM school in the Spring, almost all participants mentioned this element in some way. Barbara (who participated in both Fall and Spring) said **"**One way to help STEAM move along is to incorporate the community and the family in this approach, come up with a program that could help bring more attention to a concept while also helping students learn and make the connection between school and home." Sally, also a 2-semester participant, in the Spring said "family and community engagement is very important. With the support of the community there are more opportunities for the school to receive more resources." In the Fall, Cindy did not reference communities. However in the Spring, she noted that in STEAM lessons, "students are doing and learning huge things, things that communities want to support."

Knowledge Transfer. In their reflections, Fall participants identified knowledge generalizability or knowledge transfer as theoretical results of STEAM lessons. Angie said she observed that "students were able to comprehend more knowledge using two content areas rather than one" and Conner similarly asserted:

> Implementing a lesson that works on both skills from multiple subjects can help the kids understand the concepts from both of the subjects. Lessons from multiple views can be a way to help the kids retain more of the information.

Mary concurred with her fellow participants. She stated:

> A STEAM approach can help students generalize what they are learning. The student is able to see that English does not just stay in English… use what you have learned in English to be able to successfully write an essay in science… or use equations that you have learned in math to be able to build a bridge. Students need to realize that subjects bleed into one another.

Spring participants also identified the possibility of transfer as an outcome, but some students also reported seeing the outcome in their field experience. Octavia said that she intentionally set up stations in her lesson where students took a math problem from one station and applied it in many other subject contexts in different stations. Most students opted to make themselves the center of the math problem that they took from station to station and she concluded that the activity "allowed the students to get creative while also generalize the learning goal and see how they can apply the standard to their everyday life." Barbara, in her Spring teaching, also saw that intentionally planning lessons with a "real- life perspective" and using students' "fascinations" to frame the lesson:

> *…students were able to connect the things that they are learning in the classroom to things that they see happening and going on within their own homes or environments. This makes learning more beneficial to them by showing them that it is useful to know the things that they are learning.*

Teacher Collegiality/Collaboration. Like the Fall semester, participants in the Spring semester also made clear references to the help and participation of their collaborating teacher while they planned and taught using a STEAM instructional approach. Five Fall participants specifically articulated the positive impact of the cooperating teacher's "reassurance" and "cooperation." For example, Angie said "my teacher reassured me that I should not worry about the lesson. She looked over my lesson plan and noticed my fear…she would ask and make suggestions about what she thought needed to be added to my lesson plan." Similarly, Sally recounted "my collaborating teacher was very helpful through this entire process. She gave me countless advice and helped me decide. She was willing to help me with anything I needed. Many participants indicated that participating in the STEAM approach stimulated professional dialogue with their collaborating teacher. Katie's narrative is a good example of this result: "I showed Mrs. R my plans. She showed me the lesson plan her school uses. Mrs. R was willing to help me with whatever I needed." Barbara's narrative linked dialogue and collegiality with resulting encouragement: "Communicating with my clinical teacher was important. She was excited and formatted her lesson plans to fit in my STEAM lesson. She was encouraging." Later in the same reflection, Beth noted, "You need to collaborate with other teachers from other disciplines to find out how best to connect the information and assist your students in learning."

In the Spring, the majority of participants spoke about the "helpfulness" of their cooperating teacher and how it was necessary for successful classroom implementation. "My collaborating teacher was very helpful through this entire process. Even though she did not have much experience with STEAM, she gave me advice and she was willing to help me with anything I needed" (Sally). Other students also spoke about the benefits of cooperating with teachers across the curriculum to promote successful outcomes. Elizabeth indicated that "working with the Gifted Education teacher can be a huge help as well for integrating STEAM into the curriculum." Fiona saw value for both her collaborating teacher and herself through the experience. She said:

> *Teachers can also benefit from a STEAM approach by being challenged to work with colleagues or professionals with a variety of expertise in order to create coherent and well-constructed STEAM lessons. I have been able to resolve issues*

> *by getting plenty of input from my observing teacher. I have been able to consult with people who have created STEM lessons for students with disabilities and tell them my concerns. Thankfully I have worked with a very encouraging team oriented teacher and she has been very positive about my use of STEAM approaches in the classroom.*

Moreover, some collaborating teachers had misconception that STEAM education works better for young children than older students. For instance, Katie said "The SPED teacher I worked with was helpful but she suggested I collaborate with the first grade teacher for STEAM education."

Student Empowerment/Self Efficacy. Participants from both semesters identified improved student empowerment and student confidence as a result of utilizing STEAM educational approaches in the classroom. Fall participants connected STEAM education with "student success in lessons" and student "enjoyment" leading to less hesitancy toward "attending college" (Angie). In addition, Connor connected STEAM education with "Students being able to talk about their interest and question they have" and Barbara saw a result of the STEAM approach as "giving students options." Elizabeth went further to connect interest with confidence:

> *Not everyone automatically sees themselves as a math person or a science person, but if students are able to combine their passions with a strong set of STEAM skills, they can do what they love. This approach can give students ability to have knowledge as well as the confidence to dream big and work hard. The sense of confidence and accomplishment that comes from completing a task through STEM will help any student leaps and bounds into their own futures.*

Spring participants' comments were similar to those of their Fall semester counterparts. Barbara said that while teaching a STEAM lesson, "it was interesting to see kids brainstorm." She further noted that the students behaved as if "they have a part in what they learn." The same sentiment of student centeredness came from Fiona "STEAM approach can be an exciting way to give students a voice in the planning process." Other students saw the STEAM approach as one that "allows for the students' strengths to be used and for their weaknesses to be developed. Students can show more of what they know because they are not being measured by one standard" (Sarah).

Challenges

Content Knowledge (CK). When talking about challenges, participants in both semesters discussed the need for improved content knowledge on the part of the teacher to be able to effectively deliver authentic, integrative education to all students. In the Fall, Katie succinctly stated "the main barrier is a lack of knowledge." Leslie told us that in order to be able to effectively plan and teach using a STEAM approach, "you have to research all the ideas and hands on activities." Spring participants expressed similar sentiments to their Fall counterparts. "A STEM lesson requires the teachers to have more in-depth knowledge of the subjects than they are normally expected to have, especially those who are going into the lower grades" (Lisa). Wally concurred when he stated "STEAM subjects are difficult to learn but also difficult to

teach."

Pedagogical Content Knowledge (PCK). Participants recognized that they, along with their mentor teachers, need additional training and opportunities to practice planning for and implementing STEAM education in the classroom. George, a Fall participant, noted that in the school where he was placed, "there was a huge lack of consistency which, from what I saw, made it difficult for any of the teachers to further promote the use of STEAM in the school." Angie echoed this observation when she said "Many school systems are having a difficult time doing STEAM due to the lack of knowledge of STEAM…many schools are letting the students create science projects and calling it STEAM." Katie ran into a roadblock when trying to design and implement a STEAM lesson. She recounted "I let my collaborating teacher know I was supposed to add STEAM to my lesson plan. She said the school was not a STEAM school and therefore the inclusion classes don't add STEAM to the lesson plans." Leslie also saw a lack of understanding by in-practice professionals when she participated in her Fall field experience. She observed that the teachers "have not got the correct training on STEAM education or sat in a lecture of what STEAM lessons are or what they consist of." Bonnie also articulated the existence of poor teacher self-efficacy and a need to "be perfect on the first try" as a result of lack of pedagogical understanding about STEAM education. After their field experiences in the Spring, participants' reflections included many of the same sentiments as noted from their Fall counterparts. Angie (who was both a Fall and Spring participant) said "not many people that were there that were able to give me advice on developing a STEAM lesson plan. Learning experiences are for the both of us." In Katie's Spring placement, she reported that "Teachers say they have heard of STEAM or they have had training but don't use it." Several students advocated for additional teacher training in STEAM approaches. "Teacher preparation is not sufficient in the colleges of today. Nor have teachers been trained correctly. Teachers need to do research on STEAM approaches and how to incorporate STEAM lessons into their own class" (Sarah).

Technological Pedagogical Content Knowledge (TPCK). The "T" in STEAM stands for Technology and refers to engineering technologies and the technology education associated with this discipline (Kelley, 2010). In their lesson plans and reflections, however, all participants referred to their use and incorporation of instructional technologies like smart boards. Not one of them referred to engineering, technological, or artistic design as the root of the learning processes in their lessons. For example, Mary (a Fall participant) stated "We decided to implement technology into the lesson such as watching the movie trailer on the smart board or playing a game on the smart board." Octavia talked about "keeping students engaged and motivated using the kahoot game." Similarly, Charles thought that "modern technology, such as the Promethean board, made utilizing the technology component of STEAM very simple as all modern classrooms are implemented with one." He continued his discussion of technology by referencing the "class website" to "formulate an online document" thereby "using technology more fully."

Support. Study participants identified many areas needed to support STEAM teaching. Fall responses focused on the lack of ready-made curricular resources, a lack of time to effectively plan and implement integrative lessons, and a lack of funds to purchase supplies. Overwhelmingly, the majority of the comments spoke to time as the biggest barrier.

"Having the time to implement a STEAM lesson efficiently, not something to be rushed," was a specific concern of Cindy's. Faith thought that "adding more activities and new information to an already tight schedule proved to be the biggest challenge of all." Emily articulated similar sentiments:

> *The amount of time it takes when using a hands-on approach to teaching typically takes more time than simply lecturing students. As a future teacher in hopes of implementing STEAM, I will have to do hours upon hours of extensive planning and research.*

Finally, Leslie revealed "it does take more planning time out of your work day as well as your personal time. Teachers at my school wondered about the time that it would take out of their planning time." Spring participants, like their Fall peers, expressed concern about lack of money and other supplies and lack of time. Cindy, for example, spoke to each of the above-referenced issues:

> *Having the time to efficiently implement a STEAM lesson and being well-prepared for it are very crucial. It is a thoroughly thought out process. Not all schools have the money for things in a low income school, they may not have enough money to purchase the equipment and supplies.*

Elizabeth also referenced time and resources as issues:

> *The amount of time needed to plan a STEAM lesson, in my opinion, is more time than it takes to compose a regular lesson plan. Administration may not support the use of STEM in a special education setting and therefore not give the supplies or monetary support. Teachers are under a lot of pressure to fulfill other duties and the idea of developing entirely new lesson plans involving STEAM are low on the priority list.*

Fiona stated "a lot of teachers simply may not have sufficient time to create and collaborate with others about STEAM lessons." Katie concurred "the time it takes to prepare a STEAM lesson is longer than a non-STEAM lesson." Bonnie asserted that school structure must change to support a STEAM educational approach because "you need to collaborate with other teachers from other disciplines to find out how best to connect the information and assist your students in learning." Participants in the Spring semester articulated that a lack of parent/community involvement could also be a barrier. Many schools do not have the resources to provide proper STEM education. "One way to resolve the lack of resources is to ask parents to donate, as the community to donate, as the businesses to donate" (Sarah). Katie concluded, "I believe educators have to buy into STEAM per say and then they have to sell it to the families and communities".

Discussion and Conclusion

The present study involved a period of two consecutive semesters and about half of the participants took part in both Fall and Spring. At the outset of the research cycle, participants read current, peer-reviewed articles about STEAM education. It was interesting to note that before attending the first training session and despite their background reading, participants

revealed deep misconceptions about STEAM education. They viewed STEAM as S.T.E.A.M. (individual disciplines) or different subject matters that one teacher should cover in a course. Participants did not express awareness of design as the core of learning nor of any cross-cutting skills that could result from this educational approach. Although the articles that participants had read prior to the training workshop provided explanations about what STEAM education is, they did not make consistent interpretations of the meaning of STEAM education. This phenomena does not stand alone. Despite increasing national funding and awareness, definitions and explanations about STEAM education continue to be lacking in continuity among authors, reviewers and practitioners National Science Board (2016). These pervasive inconsistencies in the educational literature and among STEAM professionals contribute to a lack of meaningful impact to student achievement in STEAM disciplines and subsequent student persistence in STEAM subjects (National Science Board, 2016).

After the workshop, most participants perceived specific advantages of STEAM education and articulated the belief that this approach would benefit all students, including students with special needs. It seems that the more the participants learned about STEAM education, the keener they were to implement STEAM in the classroom with all students. Participants began to discuss the importance of integrative learning across content areas, real-life problem solving skills, critical thinking, and teacher collaboration in their reflection papers. A STEAM site visit was conducted in the second semester before students taught their STEAM lessons in K-12 classrooms. After the school visit, participants wrote their reflection on this trip. All of them viewed STEAM approaches positively and were impressed by the learning environment arrangements, school administrators' support, teachers' collaboration, and students' confidence. Several participants mentioned that they wished to see more students with special needs being involved in such a positive learning environment, and to learn more about how to accommodate students with special needs in the STEAM classroom. The experience added valuable perspective to what these participants were learning in class.

In both semesters, despite articulating the need for integrative approaches to affect student development of 21st century skills, participants did not include most of these essential components in their lesson plans. Participants tended to lean on science and ELA as the dominant subjects for their STEAM lessons and no design focus or designing of artifacts to demonstrate understanding was utilized. Almost all participants in both semesters constructed lessons that were confined to student learning of facts. When given the choice, participants in the Fall more often chose science to include in their lessons and used science as the "go to" discipline in which to find context for application. In essence, the participants equated science with STEAM. By Spring, this preference was no longer visible. Participants were equally as likely to choose math or ELA as subjects to present in a STEAM lesson, but like their Fall counterparts, situated student outcomes in the learning of facts and not higher level skills or abilities. No participants made reference to the use of arts or engineering as contexts for applying knowledge or constructing understanding. Additionally, they did not demonstrate use of the same habits of mind that they were trying to teach and found valuable.

Moreover, the participants' practices in the classroom indicate that they did not have a conception of technological artifacts or engineering artifacts. They did not understand technology as engineering technologies. Rather, they identified technology as the tools in the

classroom to help deliver instructions. Instructional technologies are important components of effective instruction - STEAM or otherwise. In our current technologically defined society, it is important that students be able to effectively utilize technological tools. From the perspective of STEAM education, however, having preservice teachers engaged in the design process toward the production of an engineering, technological or artistic artifact as a framework in which to construct and provide evidence for educational understandings is the hallmark of this approach. The participants' misunderstandings are consistent with what has been observed in other studies and points teacher-educators to an area for improvement.

Reflections also revealed that collaborating teachers are still in the beginning stages of the teaching continuum themselves, therefore not able to meaningfully support the novice teacher out of a directive mode and into a more facilitative role. Several participants pointed out that their collaborating teachers were also new to STEAM education, and thus they did not receive much instructional support on their STEAM lessons during fieldwork. Another important issue is the relationship between collaborating teachers and preservice teachers. When the participants had a better relationship with their collaborating teachers, they tended to feel more comfortable to use innovative teaching strategies. Through the requirement of implementing a series of STEAM lessons, participants were placed more in a position of equality and collaborating teachers and participants became co-inquirers in the classroom.

Interestingly, although response to intervention (RTI) and other approaches like differentiated instruction had been introduced to the participants throughout their program, none of them discussed the incorporation of evidence-based strategies to help deliver STEAM education more effectively. Some participants even had a misconception that by "doing STEAM" they were automatically facilitating differentiation. That is, they thought that when students have access to multiple subjects at the same time, this would automatically qualify as differentiated instruction. The goal of using differentiated instruction is to help students perform better on a lesson through utilizing a variety of strategies. Lilian Katz's quotation provides a good explanation for why teachers need differentiated instruction, which also distinguishes differentiated instruction from the STEAM approach: "When a teacher tries to teach something to the entire class at the same time, 'chances are, one-third of the kids already know it, one-third of the kids will get it, and the remaining third won't. So two-thirds of the children are wasting their time' (IRIS modules, 2017). In other words, when teachers are implementing STEAM education in their classrooms, they still need to find intentional ways to help those who are behind to catch up with their peers, regardless of teaching one single subject or multiple subjects, and to challenge those who are more advanced than their peers.

The present study leads to several important implications for STEAM education practitioners and providers. It is imperative that all stakeholders strive to reach consensus as to a working definition and research-based approaches that may be considered hallmarks of STEAM education. Confusion about the acronym and its applications, both in and out of the classroom is pervasive and may be inhibiting meaningful K-20 progress toward a STEAM literate society. Additionally, explicit training in integrative practices toward transdisciplinary approaches is a meaningful endeavor for all teachers. Preservice and inservice teachers are largely uninformed as to the methodologies that undergird this kind of education and would therefore benefit from explicit instruction and support as they learn how to implement integrative approaches in their

classroom. Such training should include opportunities for collaboration across disciplines as well as among educators of all different experience levels. Oftentimes, we saw preservice teachers mentoring their collaborating teacher just as much or more than the reverse. Our research indicates that a STEAM education focus may indeed act as a "leveler" of sorts, putting novice teachers on par with seasoned educators in one way as they both learn new educational approaches and explore trying them out in the classroom.

Our research reveals that STEAM education supports collaboration not only among preservice teachers but among inservice teachers and community. As a part of the training, teachers should be allowed to experience a working STEAM school. As shown in our study, when preservice teachers participated in the site visit, they were more likely to notice and value the important role of family and community engagement and improved literacy connections that are supported by STEAM education. They began to realize that the approach was indeed possible and that student outcomes could meaningfully be improved. The experience functioned to help preservice teachers to connect the theoretical with reality, resulting in a firmer foundation on which to build practice.

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About the Authors

Nai-Cheng Kuo, PhD, BCBA, is an assistant professor in the Special Education Program at Augusta University. She received her dual-major doctoral degrees in Teacher Education and Special Education from Michigan State University. Her research interests include special education and teacher education, educational philosophy, value-creating pedagogy, Response-to-Intervention (RTI), and applied behavior analysis. She has presented and published on these topics.

Ashley H. Gess, PhD, is an assistant professor of STEAM Education at Augusta University. She is a 22 year veteran of the K-16 science classroom and holds a doctorate in Integrative STEM Education from Virginia Polytechnic and State University. Her research focuses primarily on investigating the use of Engineering design, Engineering Technology design and/or Artistic design as authentic contexts in which to develop understandings and documenting the impacts on both teachers and students, specifically those underrepresented in STEM professions. She regularly collaborates, presents and publishes on these topics.

Increasing Teachers' Use of Behavior-Specific Praise with the Teacher vs. Student Game

Renée E. Lastrapes, Ph.D.
University of Houston-Clear Lake

Jennifer N. Fritz, Ph.D.
University of Houston-Clear Lake

Robert C. Hasson, Ed.D.
Concordia University-Texas

In memory of Robert C. Hasson, Ed.D. who passed away much too soon on 20 October, 2017. We thank you for your work on this study and dedicate this manuscript to you and all of your students.

Abstract

The purpose of this study was to examine whether the use of a simplified version of the Good Behavior Game called the Teacher vs. Student Game, implemented as an interdependent group contingency, increased teachers' use of behavior-specific praise (BSP) statements. Two middle school resource teachers and their respective classes participated in the study. Both classes consisted of students with various disability classifications, including emotional and behavioral disorder. Using the group contingency as a way to manage student behaviors, teachers' rates of BSP statements, general praise statements, and corrective statements were scored. Results indicated that the game increased BSP statements but had little effect on general praise statements and corrective statements.

Keywords: behavioral game; classroom management; interdependent group contingency; behavior-specific praise; inclusion

Increasing Teachers' Use of Behavior-Specific Praise with the Teacher vs. Student Game

Teachers are under tremendous pressure to produce improved academic outcomes for both general and special education students, but this is far more difficult when teachers are presented with behavioral challenges in their classrooms. National laws such as No Child Left Behind (NCLB; 2001), Individuals with Disabilities Education Improvement Act (IDEA; 2004), and more recently the Every Student Succeeds Act (ESSA; 2015) brought the issue of utilizing strategies that were scientifically-based to national attention. Evidence-based practices (EBPs), both to improve academic performance and mitigate behavior problems, are those that are widely supported by empirical research (Spencer, Detrich, & Slocum, 2012; Cook, Tankersley, & Harjusola-Webb, 2008). Many evidence-based practices have been examined that pertain to behavior and classroom management. Simonsen, Fairbanks, Briesch, Myers, and Sugai, (2008) conducted a literature review and identified 20 EBPs in classroom management. However, a gap exists in education between strategies that are validated with research evidence and their use by practitioners (Cook & Odom, 2013). This research-to-practice gap has been explained by

researchers as teachers not having access to or understanding of the extant research, as well as by practitioners claiming that some strategies promoted by researchers are not feasible in the "real world" (Spencer et al., 2012). Of the many EBPs, one that requires relatively low effort has been referred to as contingent teacher attention (Sutherland, Alder, & Gunter, 2003), positive attending (Perle, 2016), or behavior-specific praise (Allday et al., 2012).

Behavior-specific praise (BSP) is defined as providing students with "favorable verbal or nonverbal attention directed toward a behavior or characteristic of the target children" (Jenkins, Floress, & Reinke, 2015, p. 464). Behavior-specific praise is operationalized as positive statements made by the teacher that describe the behavior being praised explicitly. Utilizing this type of praise increases desirable behavior in the classroom (Beaman & Wheldall, 2000; Brophy, 1981; Fullerton, Conroy, & Correa, 2009; Richardson & Shupe, 2003), as well as increases task engagement (Allday et al., 2012; Gorman-Smith, 2003; Sutherland, Wehby, & Copeland, 2000) and decreases off-task behavior (Reinke, Lewis-Palmer, & Martin, 2007) for students with and without disabilities including emotional and behavioral disorders (EBD). Studies have shown, however, that teachers' use of behavior-specific praise is not frequent (Anderson, Evertson, & Brophy, 1979; Jenkins, et al., 2015) and that teachers do not use this intervention frequently in inclusive settings (Alber & Heward, 2000; Musti-Rao & Haydon, 2011).

There is a growing body of research that explores ways to bring research to practice, specifically examining ways to improve teachers' use of praise (Jenkins et al., 2015). Researchers have sought to improve rates of teacher praise by utilizing individual teacher training (Fullerton et al., 2009) and training through professional development (Allday et al., 2012; Briere, Simonsen, Sugai, & Myers, 2015), as well as implementing different forms of performance feedback (e.g. video self-modeling and email) (Hawkins & Heflin, 2011; Rathel, Drasgow, Brown & Marshall, 2014) and using a response-to-intervention model (Myers, Simonsen, & Sugai, 2011). In the study conducted by Allday and colleagues (2012), it was reported in their social validity findings that teachers indicated that it was difficult to increase their rates of BSP. What isn't known is whether the importance of BSP as an evidence-based practice is recognized by classroom teachers. When teachers were asked their views on the usefulness of evidence-based practices in general, teachers indicated that they would be likely to use new evidence-based interventions if they were feasible, flexible (for multilevel classrooms), appropriate, and were accompanied by required materials and training support (Boardman, Argüelles, Vaughn, Hughes, & Klingner, 2005).

The Good Behavior Game (GBG; Barrish, Saunders, & Wolf, 1969) is an interdependent group-contingency technique that has been widely supported by empirical research and has a large research base showing its effectiveness (Tingstrom, Sterling-Turner, & Wilczynski, 2006). Two studies have examined the reciprocal effects of the Good Behavior Game on teacher behaviors. One showed an increase in on-task behaviors by students, but low levels of praise throughout all phases for the teachers (Lannie & McCurdy, 2007) while the other implemented a version of the GBG that is similar to the Teacher vs. Student game (Elswick & Casey, 2011). In their game, Elswick and Casey modified the GBG by having the teacher play against the students rather than divide the class into two or more teams, but retained the components of the GBG by having the teacher reward points and reinforce with BSP for three target areas. Elswick and Casey reported positive results for their study, with teachers increasing BSP and behaviors improving for the

students. A similar approach has been described as the Teacher-Student Learning Game (TSLG; Nelson, Benner, & Mooney, 2008), an instructional management technique for students with emotional and behavioral disorders to facilitate better classroom instruction but without the stipulation that teachers reinforce positive behaviors with BSP.

The TSLG has a small body of research that supports its effectiveness in classroom instruction. Harris, Oakes, Lane, and Rutherford (2009) evaluated the differences between internalizing and externalizing behavior and a reading intervention, reinforcing positive behavior with the TSLG. Results showed an increase in oral reading fluency as well as an improvement in student on-task behavior. Oakes, Mathur, and Lane (2010) used a modified version of the TSLG and the Teacher-Class game (Bursuck & Damer, 2007) to support a multi-dimensional secondary intervention package to support oral reading fluency with fourth graders. While the focus of the study was reading fluency and not behavior management, the researchers reported that students with behavioral difficulties responded to academic prompts at a greater rate after the implementation of the behavior supports (Oakes et al., 2010). To date, it is not known if there are empirical studies that focus on the TSLG exclusively to improve student behaviors. In light of the myriad ways researchers have attempted to increase teachers' use of BSP in the classroom, the present study sought to increase teachers' use of BSP by implementing a very feasible, flexible, and simple game that required minimal training called the Teacher vs. Student Game.

The Teacher vs. Student (TvS) game is a simplified version of the GBG and the TSLG that is implemented as an interdependent group-contingency for students with or at risk for EBD. This game can be used in self-contained settings or in inclusive settings with both students with and without disabilities. In the TvS game, the students "play" against the teacher and receive a pre-determined reward if they win. Although the TSLG and the TvS game are almost identical in rules (see Nelson et al., 2008, p. 159-169), the TvS differs in two ways. The TSLG has the teacher award 5 points every time she sees students exhibiting behavior in accordance with expectations or 5 to herself when they do not. The TvS simplifies this by having the teacher only dispense one point at a time, and the TvS differs in that it adds the rule that when the teacher gives the student the point, she does so by reinforcing the correct behavior being awarded the point with *behavior-specific praise*. Nelson and colleagues (2008) suggest that the game be introduced and played every day for the first three days of school, but the TvS game can be introduced at any time throughout the school year and can be used either in instructional or non-instructional time. Although the use of the interdependent group-contingency technique is to increase on-task and decrease off-task student behaviors, the rules of the game necessitate that the teachers utilize BSP while playing.

The purpose of this study was to determine if this simple game could increase teachers' use of BSP statements, as well as influence general praise statements and corrective statements, in two middle school resource classrooms. This is the first empirical study of the TvS game and whether it positively impacts teacher attention and BSP toward students.

Method

Participants and Setting

After obtaining approval from both the school district and university institutional review boards, the researchers met with two teachers nominated by the school principal to explain the study and

determine if they were interested in participating. The teachers were nominated by the principal because they were both special educators who had students with or were in the process of being assessed for emotional and behavioral disorders in their classes. Ms. Matthews taught eighth grade resource, had a master's degree, and 15 years of teaching experience. Ms. Boyd taught seventh grade, had a bachelor's degree, and 3 years of teaching experience. Ms. Matthews' class consisted of six students (two males and four females), four of whom were Hispanic and two were African American, ranging in age from 14 to 15 years. Two of the six students were being monitored for behavioral issues. Ms. Boyd's class consisted of seven students (six males and one female), all of whom were Hispanic and ranged in age from 13 to 14 years. Two of the seven students were classified EBD and received support and monitoring from a behavioral specialist.

The middle school where the study took place is located in a large suburban district in the southwest that serves 55,000 students (TEA, 2016). Approximately 25% of the students in the district are English language learners and 9% have individualized education plans (IEPs). The school serves 620 students in seventh and eighth grade and is a Title I school that practices Positive Behavior Interventions and Supports (PBIS). Eighty-four percent of the students are Hispanic, 47% at-risk, and 18% mobility rate is reported for the campus. The two participating classrooms were self-contained (pull-out) instruction for their students. The study took place in the middle of the day, during back-to-back periods where the researcher went from Ms. Matthews' class to Ms. Boyd's class.

Research Design

A multiple baseline across participants design (Baer, Wolf, & Risley, 1968) was used to determine the efficacy of using the TvS game to increase teachers' behavior-specific praise statements. General praise and corrective statements were also investigated.

Dependent Variables

There were three dependent variables for this study: behavior-specific praise (BSP) statements, general praise (GP) statements, and corrective statements (CS). *Behavior-specific praise statements* were defined as statements delivered audibly that references a desirable behavior (e.g., "Thank you for being so quiet while taking your test," "You did a good job passing out the papers," "I like how you are sitting with your eyes facing forward."). *General praise statements* were defined as praise statements in response to student behavior but without a specific comment as to why the praise was being offered (e.g., "Good job," "Way to go," "Nice"). *Corrective statements* were defined as criticism of a certain behavior or verbal expression of disapproval by the teacher to a student(s) or class as a whole (e.g., "You need to stop," "Quit it," "I'm talking.") All statements were scored using a frequency measure.

Interrater Reliability

In order to assess the reliability of the observations, the first author scored teacher statements in the classroom and created audio recordings during the class period, and the second author collected data independently during at least 30% of baseline and treatment sessions for both teachers. Exact agreement was scored during 60-s intervals by dividing the number of agreement intervals by the total number of intervals and multiplying by 100. Reliability for BSP averaged 97.7% (range, 90.9% to 100%), GP averaged 98.5% (range, 90.9% to 100%), and CS averaged 92.4% (range, 81.8% to 100%).

Treatment Fidelity

The first author scored treatment fidelity using a checklist of the steps. If the steps were present then it was marked with a one, if not it was marked zero. Treatment integrity data were collected during 30% of the sessions for each teacher. Ms. Boyd implemented treatment with 100% integrity. Two steps in the fidelity checklist were explicitly ending the game, and announcing the winner, followed by disseminating the prize(s); in 83% of sessions, for Ms. Matthews, the end of the game wasn't explicit nor was the announcing of the winner, but each time the students did win and she disseminated prizes.

Procedure

The study was conducted in two consecutive class periods in the afternoon in the two participating classrooms, and the observation sessions consisted of 11 min time intervals. The baseline and intervention phases were conducted in the spring semester. The first author was the sole observer and sat in the same spot daily in the back of the room during baseline and treatment and audio recorded each session.

Baseline. Prior to the start of the study, the teacher met with the teachers to obtain their consent and to explain the procedures. The consent form indicated that the purpose of the study was to determine whether the game increased on task behaviors by students and increased teachers' use of praise. Teachers were told that their classes would be observed for several periods, after which they would then be taught the game and then the classes would again be observed during the game. During the baseline phase, the teacher was not provided with any instruction on how to manage classroom behavior and conducted the class as she would normally do so.

TvS Game. Prior to treatment phase, the researcher met individually for 30 minutes with each teacher before school. The teachers were informed that they were going to play the TvS game and were given the rules (see Table 1). The researcher modeled how to play the game with the teachers and had the teachers give examples of praise statements they could use. In rule numbers 5 and 6, it was made clear that the teachers should provide BSP when delivering points to the students. The teacher explained the game and made clear the behavioral expectations. As she taught, she would notice appropriate behaviors, give students points, and reinforce the behavior with BSP. If students engaged in disruptive or off-task behavior, the teacher awarded herself a point; however, if the students corrected their behavior, the teacher provided BSP and gave the students a point. The teachers were given demonstrations to differentiate behavior-specific from general praise, and were told that, if possible, they should ignore negative behavior and try to avoid corrections, which could reinforce those behaviors.

Table 1

Rules for the Teacher vs. Student Game

Teacher vs. Student Game: Rules of Play
1. Prior to playing the game with students, review behavioral expectations required for the instructional mode you are about to use (group work, individual work, etc.).
2. Tell the class you are going to play the Teacher vs. Student Game.
3. Students will earn a point for on-task behavior, and teacher will earn a point if she sees a student demonstrating off-task behavior.

4. Draw a T chart on the board and begin teaching.
5. When the students are behaving appropriately, give them points as you reinforce the behavior with behavior-specific praise.
6. When they are off-task, give yourself a point, and then state the specific activity you would like to see that would all the students to earn points. If they correct their behavior, immediately give the students a point while reinforcing with BSP.
7. At the end of the period, the team (teacher or students) with the most points wins.
8. Reward the winner with a pre-selected prize (e.g., game time, early release to break/recess etc.)

Social Validity. Each teacher was asked to complete a modified version of the Intervention Rating Profile (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985) to assess the social acceptability and validity of the TvS game. The IRP-15 is a 15-item scale that assesses acceptability of interventions. The Likert-type scale ranges from 1 (strongly disagree) to 6 (strongly agree) with an overall possible score ranging from 15 to 90 with higher scores indicating higher levels of acceptance of the intervention. Two qualitative prompts were included in the instrument, "Please tell me any pros or cons of this intervention" and "Please share anything else you would like about this intervention."

Results

Figure 1 displays the number of BSP statements both teachers made during baseline and treatment phases. Both teachers provided very few BSP statements during baseline (i.e., BSP statements were only provided in three sessions by each teacher). The TvS game resulted in an initial increase in BSP that gradually decreased across sessions but maintained at higher levels than baseline. While the trematment phase is variable for both teachers in terms of BSP, it can be said that a functional relationship was evident in that the two teachers went from producing little to no BSP statements during baseline to using them regularly during the treatment phase.

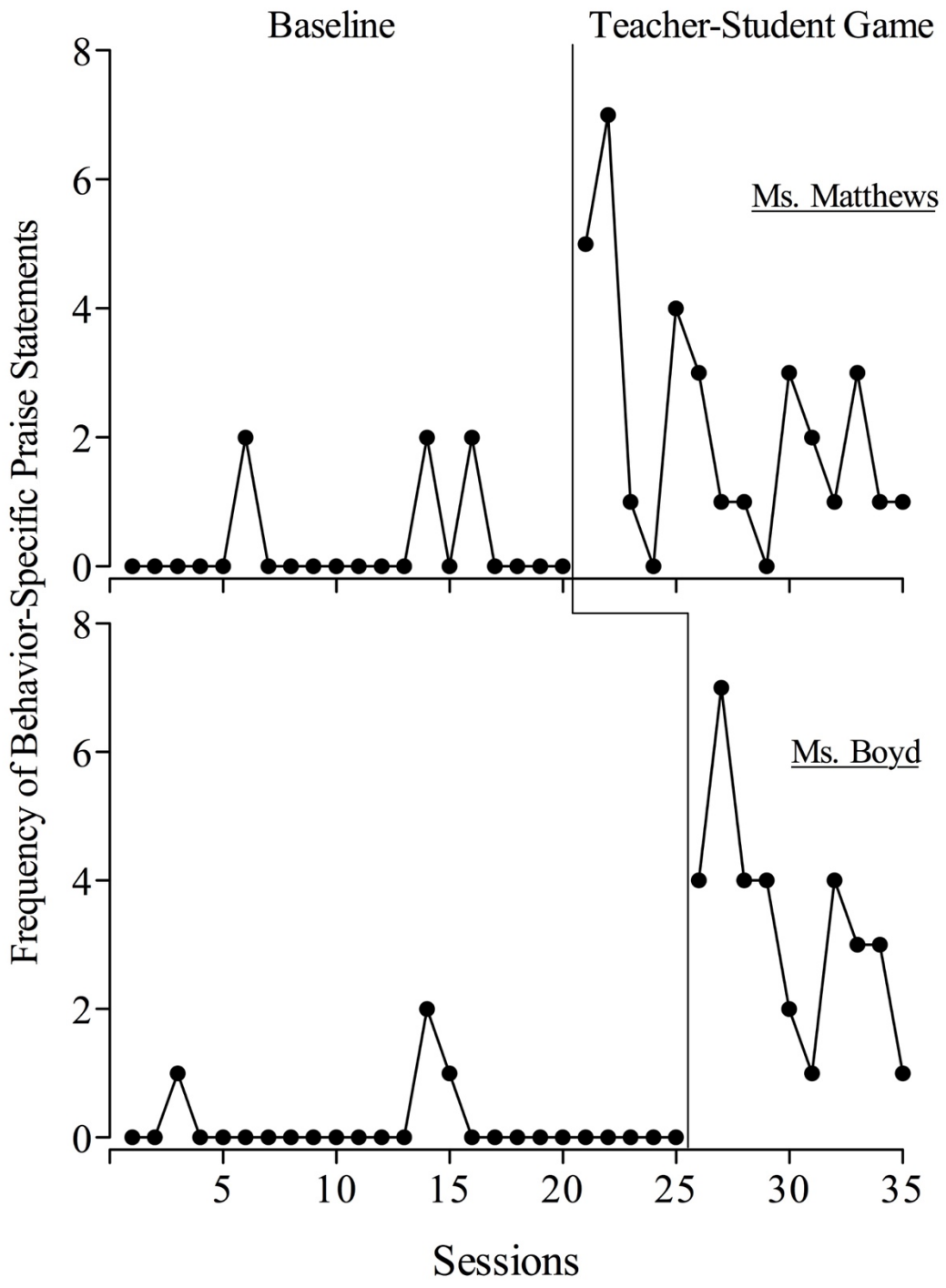

Figure 1. Number of behavior-specific praise statements across both classrooms. Intervention phase shows an increase but declining trend in BSP statements.

Figure 2 displays the number of general praise statements across both classrooms. Ms. Matthews shows higher levels of praise across the two phases, while Ms. Boyd shows a decrease during the intervention phase. The number of corrective statements across both classrooms are shown in Figure 3. Ms. Boyd shows a decrease of corrective statements during the intervention while Ms. Matthews shows an increase in corrective statements in the intervention phase, which correspond to the inverse of her BSP statements. Both teachers provided few GP statements and numerous CS statements during baseline. Table 2 shows the mean totals for each type of statement for both teachers during baseline and treatment phases.

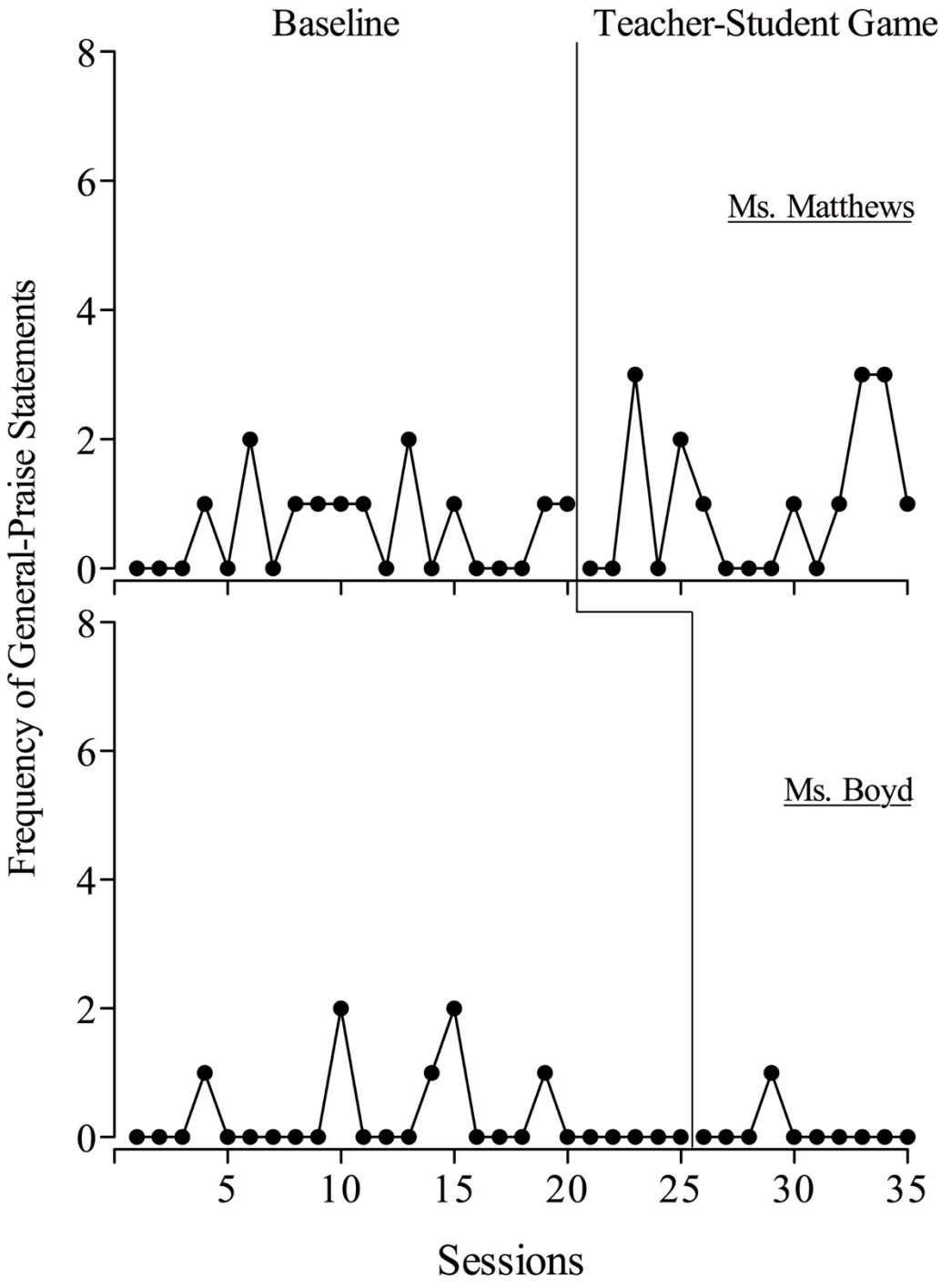

Figure 2. Number of general praise statements across both classrooms. Ms. Matthews shows higher levels of praise across the two phases, while Ms. Boyd shows a decrease in the intervention phase.

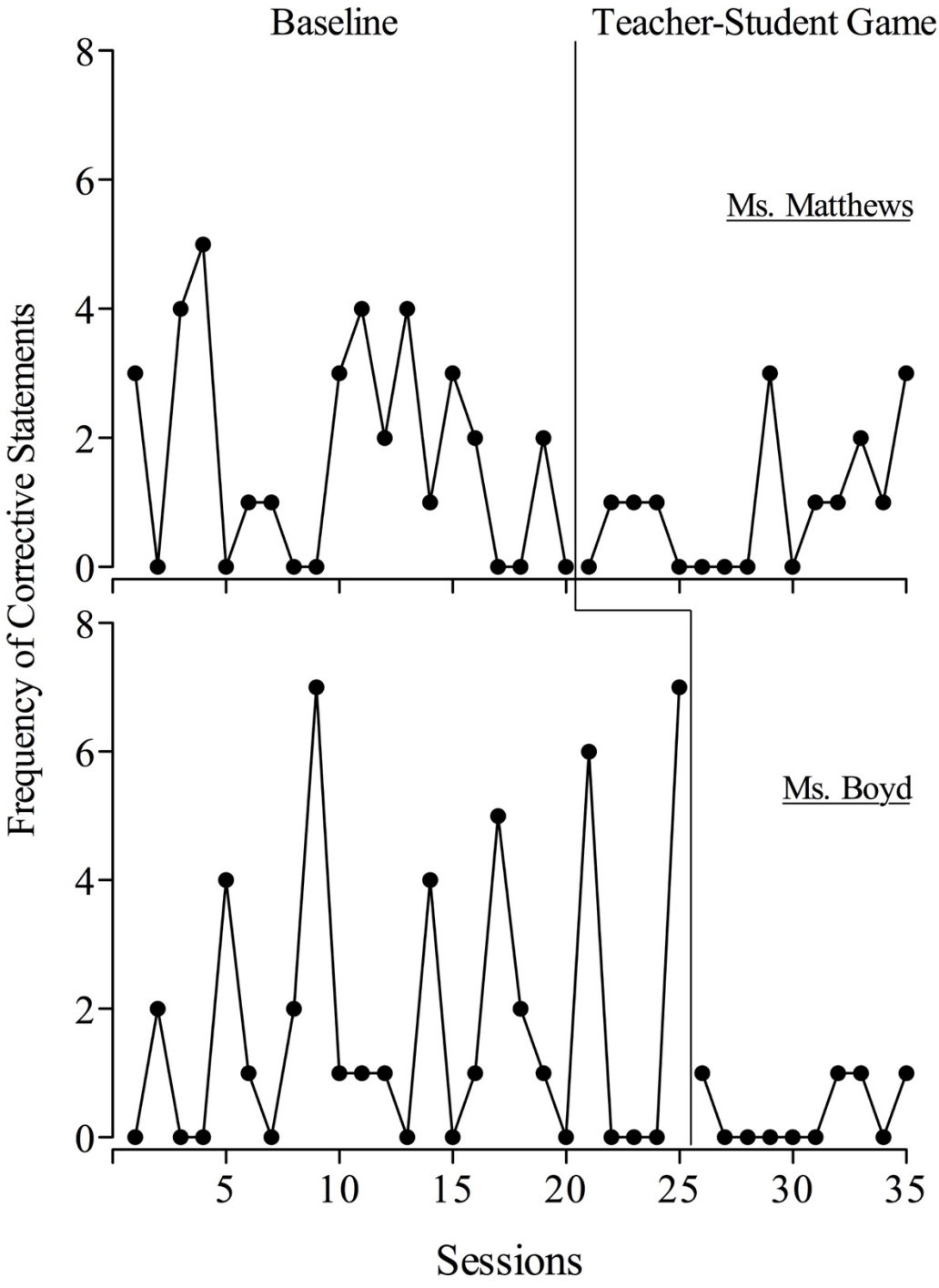

Figure 3. Number of corrective statements across both classrooms. Ms. Boyd shows a decrease of correction in the intervention phase while Ms. Matthews shows an increase in corrective statements in the intervention phase, which correspond to the inverse of her BSP statements.

Table 2
Mean Number of BSP, CS, and GP per teacher during baseline and treatment phases

	Baseline	Treatment	Baseline	Treatment
	Ms. Matthews		Ms. Boyd	
Behavior-Specific Praise	0.32	2.07	0.17	3.0
Generic Praise	0.58	1.0	0.29	1.0
Corrective Statement	1.84	0.88	1.58	0.09

Regarding social validity, overall results on the IRP were positive. Ms. Matthews rated the intervention a 79 of 90, which is 88% favorable, and Ms. Boyd rated the intervention 86 of 90 which is 96% favorable. Ms. Matthews responded to the first prompt with "some teachers and/or students might feel it [the TvS game] is 'elementary.'" Ms. Boyd responded to the first prompt, "The students like to compete against the teacher and they are extremely motivated," and to the second prompt she stated a modification she made to the game, "If they [the students] beat their score from yesterday then they get an extra point." In a verbal comment to the researcher, Ms. Boyd said she made the modification to the game to further motivate her students and that she was surprised that the class responded as well and as quickly as they did to the game.

Discussion

The purpose of this study was to investigate the effects of the TvS game on statements made by teachers in two resource classrooms at the middle school level. Although the interdependent group-contingency technique was used for the students, the rules of the game necessitate that in order to play, teachers must use behavior-specific praise. The results suggest that the teachers did increase their use of praise while playing the game; however, both teachers gradually decreased their use of BSP over time. It is unknown whether BSP would have persisted over an extended period of time. These findings resemble those of Elswick and Casey (2011) who reported that teachers' use of BSP increased as a result of an alteration of the rules of their game, in order for students to earn back lost points, teachers had to notice "unprompted appropriate behavior and verbalize that specific behavior prior to giving the students a point" (p. 43). The teacher in their study initially had unfavorable view of research in the classroom but had a generally positive opinion of the game. The reciprocal effect of the game in the current study had an impact on participating teachers' use of BSP as it was embedded in the rules of the game.

There appears to be a somewhat inverse relationship between BSP and CS, especially for Ms. Boyd. When her BSP increased (M = 0.2 to M = 3), her CS decreased to nearly zero (M = 1.6 to M = 0.1). Similar decreases in Ms. Matthews use of CS decreased initially; however, CS gradually increased to baseline levels over time. Future research should examine this relationship with additional teachers to determine whether the TvS game decreases corrective statements made by teachers.

This study is promising in that it extended the praise literature by adding the implementation of a simple game to the more time-resource intensive strategies that have been employed by researchers to increase teachers' use of BSP. When an evidence-based practice is easy to use, teachers are more likely to use it (Boardman et al., 2005). One issue to consider, however, is the impact of the number of years of teacher experience has on her willingness to adopt new

behavior management strategies. Ms. Matthews was in her fifteenth year of teaching, and although she tried the intervention and showed positive results, she did so with less treatment integrity than Ms. Boyd, who had only 3 years of experience. This tendency for more experienced teachers to be more inclined to resist change has been documented, with one barrier described as past experiences (Zimmerman, 2006). Teachers with more years in the classroom have had more experiences with different techniques and professional development, which may hinder rather than promote their own behavior change in the classroom.

Limitations

There are several limitations that need to be considered when interpreting these findings. First, the study consisted of two resource teachers at the same school and only addressed their attention toward students. It is unknown whether a more diverse teacher population would benefit from the use of this game. In addition, the school district did not allow video recording in the classrooms; therefore, student behavior was not evaluated, and it is unknown whether the game would positively impact their behavior. Furthermore, social validity findings were limited to teacher impressions, not the students, and it is unknown whether the students viewed the game favorably.

Implications for Future Research

Future studies should be implemented with additional teachers in more varied settings (general education, inclusive settings, large group settings). Future studies should consider the impact of the intervention on student behavior, as well as teacher behavior, and assess student opinions regarding the game. Finally, maintenance data were not collected due to the fact that the study was conducted late in the school year. Given the decreasing trend in teachers' use of BSP over time, it will be important for future research to determine whether the TvS game will produce sustained and meaningful increases in teachers' BSP.

Implications for Practice

The present study has practical implications for practice. Because the TvS game is so simple to implement, costs nothing, requires minimal teacher training, and doesn't have to be sustained over long periods of time, it would be easy to use during periods of unstructured class time. For example, before the bell rings when students have finished their lesson but have some idle time, the teacher can use the game to lead a discussion to reinforce the day's lesson. Additionally, the game can be implemented during test review, providing structure and positive interactions to an activity that might be stressful for students with or at risk for emotional and behavioral disorders. Finally, teachers have reported that it is difficult to remember to use BSP in their classes. The chart used to score points during the TvS game might serve as a reminder to implement the game and might increase teachers' overall use of BSP in the classroom which is an evidence-based practice for students both with and without disabilities. Finally, the TvsS game can be used as a way to introduce teachers to the concept of self-monitoring and charting their own behaviors, which can be used as a model for students to track their own behaviors as well.

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About the Authors

Renée E. Lastrapes, Ph.D., is an Assistant Professor of Educational Research and Assessment at the University of Houston-Clear Lake where she teaches graduate courses in measurement, research design, and statistics, and supervises graduate student research for doctoral dissertations. She has been a classroom special education teacher in California and Louisiana with sixteen years of experience working with students with various disability categories from diverse cultural and linguistic backgrounds. Her research interests include formative assessment in the content areas and evidence based behavioral interventions for students with behavioral disorders.

Jennifer Fritz, Ph.D., is an associate professor in the Department of Clinical, Health and Applied Sciences, where she teaches courses in behavior analysis and is coordinator of the undergraduate certificate program in behavior analysis. Dr. Fritz also serves as Director of the Severe Behavior Disorders Research Clinic at UHCL's Center for Autism and Developmental Disabilities and of the Behavior Analysis Program at Texas Children's Hospital's Autism Center where graduate and undergraduate students learn valuable clinical skills in the assessment and treatment of behavior disorders. Dr. Fritz serves on the Editorial Board of the Journal of Applied Behavior Analysis, is the Secretary of the Behavior Analysis Public Policy Group – Texas, and is the Program Chair for the Professional Track of the Texas Association for Behavior Analysis annual conference. In the past, she has served as President of TxABA, as Program Chair of the Autism Track for the TxABA annual conference, and as co-chair of the Autism Track for the Association for Behavior Analysis International.

Robert Hasson, Ed.D. was a native of Southeast Houston and served as principal of Park View Intermediate School in the Pasadena Independent School District for 17 years. He attended Pasadena ISD schools where he graduated from South Houston High School and earned his undergraduate degree in communication from the University of Houston-Downtown. He went on to earn his master's and doctorate degrees in educational leadership from the University of Houston-Clear Lake (UHCL). Dr. Hasson was a member of UHCL's Teacher Certification Council, University Expansion Committee, and University Accreditation Council; and facilitated literacy methods classes and recruiting symposiums for the College of Education. In addition, Dr. Hasson was an adjunct professor with Concordia University-Texas since 2012 and taught a variety of graduate courses in educational leadership. He was the 2016 recipient of the Marilyn S. Sims Leadership Service Award from the UHCL Alumni Association. He was active in the Texas Association of Secondary School Principals (TASSP), Phi Delta Kappa International Society, Pasadena Chamber of Commerce, Bayport Aero Club, Boys & Girls Harbor of La Porte, and South Houston High School Alumni Association. He was an outstanding educator and will be greatly missed by his family, friends, and colleagues.

Building Independence through Self-Prompting with Technology

Dana R. Reinecke, Ph.D., BCBA-D
Long Island University Post

Abstract

Self-management is an effective, well-researched set of strategies for increasing, decreasing, and maintaining one's own behavior. Self-management strategies have been shown to be effective in supporting students with disabilities, with the ultimate outcome of greater independence. Self-prompting, an important step in self-management, has become even easier to learn and implement with currently-available technology. This paper discusses the benefits of self-prompting and how technology may be used to teach and improve self-prompting repertoires, and offers several suggestions for applications to facilitate self-prompting.

Building Independence through Self-Prompting with Technology

Independence can be one of the ultimate goals for any student with special needs, but research shows that many adults with disabilities are dependent on others for a variety of needs (Billstedt, Gillberg, & Gillberg, 2005; Roux et al., 2015). Consequently, educational programs should be careful not to neglect to specifically address independence as a characteristic of learned skills. For the purposes of the current discussion, independence is defined as when the individual is not only able to, but does, initiate and carry out a task or action without assistance from another person. For example, educators certainly want students with special needs to independently indicate when they need to use the bathroom independently, without being asked or prompted. They should also be able to independently complete the bathroom routine, without the presence of a parent, teacher, or other support person. This level of independence is important because it is associated with greater personal freedoms, maximized personal outcomes, individual dignity, and reduced dependence on others. When an individual with a disability is dependent on others for basic daily needs, his or her options may be very limited (Billstedt, et al, 2005).

There are situations in which dependence on others may not be a bad thing. When one is in need of a physician, most don't choose to perform our own medical interventions. Instead, most would rely on medical professionals for those needs. Even in this example, though, independence is desirable at many levels to get to the point of having that medical intervention performed: choosing the doctor, making an appointment, discussing the options, conducting independent research, and ultimately making the final choice and following through on it, are all necessarily independent behaviors. For people with and without disabilities, a reasonable dependence on others is not a problem, but partial, if not complete, independence in most areas is an important goal (Billstedt et al., 2005).

Life skill independence is particularly problematic for many individuals with autism spectrum disorder (ASD). As students approach and enter adulthood, life skills become a possible gauge of independence (e.g., Billstedt et al., 2005; Newman et al., 2010; Roux et al., 2015). ASD has a

lifelong impact on all areas of functioning where specific challenges related to ASD, including social and language deficits, can lead to increased vulnerability in adulthood. People with ASD may also have particular difficulty in making and executing personal decisions. These challenges are compounded by the drastic reduction in supports and services available when transitioning to adulthood from the protections of the educational system (Friedman, Warfield, & Parish, 2013). Lack of federal mandates/funding and varied rules and implementation of services can lead to a nightmare sometimes referred to as "stepping off a [services] cliff" (Roux et al., 2015, p. 8). Ultimately, the primary concern for individuals with ASD may become the transition to adulthood where independence may be lacking in many areas; both due to – and compounding – the challenges that they already face due to their disability.

When behavioral repertoires are lacking, one may look in one of two directions. First, one may need to determine if the skill set is missing. If so, this can be addressed through instructional strategies. If an individual does not know how to cook for himself, steps can be taught in the cooking process. A question may arise, however: What if that individual has learned to cook, but simply doesn't do it? One possibility is that the prompts to cook are absent. The person may not have learned to cook completely independently, and is waiting for someone to tell him what to do. Prompts to cook are not problematic in and of themselves; most of us use prompts when we cook, but we call them recipes and we manage them independently. Prompts that depend on other people can be problematic, however. In the case of the person who knows how to cook and wants to cook but doesn't cook because no one is telling him how, we have a chance to facilitate independence by adding those prompts that are not related to or dependent on the presence of other people.

Research suggests that dependence on prompts provided by other people may occur due to the ways prompts are used to initially teach skills. Least-to-most prompting is the strategy most commonly used by special educators (Repp, Karsh, & Lenz, 1990). Least-to-most prompting is done by providing the least intrusive prompt possible, and gradually increasing through a hierarchy of intrusiveness until an effective prompt is found. According to Fisher, Kodak, and Moore (2007), least-to-most prompting is most likely to cause prompt-dependence, however. An alternative to least-to-most prompting is most-to-least prompting, which starts with the most intrusive prompt likely to result in the desired behavior, and then gradually reducing or fading the intrusiveness of the prompt over time. Both of these strategies rely on other people, however, as do other suggested ways to reduce prompt-dependence: teaching an observing response (Fisher et al., 2007), and differentially reinforcing independence (Hausman, Ingvarsson, & Kahng, 2014; Karsten & Carr, 2009).

An alternative to learning not to rely on prompts provided by others to learn to self-manage one's own prompts, which never need to be faded or removed (Savage, 2014), and which free up teachers and support staff from needing to deliver prompts (Shulze, 2016). Self-management is a set of operant strategies that may be controlled by an individual to support his or her own behavior (Carr, Moore, & Anderson, 2014). Self-management has been shown to lead to independence across social, work, and academic areas for individuals with a variety of challenges (e.g., Nelson, Smith, Young, & Dodd, 1991; Hume, Loftin, & Lantz, 2009; Daly & Ranalli, 2003; Patton, Jolivette, & Ramsey, 2006; Rafferty, 2010), and is considered an important early step in the development of a self-determination repertoire (Clouse & Bauer,

2016). Much of the research on self-management focuses on teaching the skills of self-monitoring, self-prompting, and self-reinforcement, and the resulting effects of learning these skills on independence in various areas. For example, adolescents in a self-contained class learned to self-manage on-task and socially appropriate behavior (Ninness, Fuerst, Rutherford, & Glenn, 1991). Teens with ASD used self-management to learn to follow schedules (Newman, et al., 1995) and engage in appropriate conversation (Newman, Buffington, & Hemmes, 1996). Children with ASD reduced problem behavior by self-managing a DRO schedule of reinforcement, in which reinforcement was self-delivered for periods of time when problem behavior did not occur (Newman, Ryan, Tuntigian, & Reinecke, 1997). Self-management has also been shown to be useful in supporting adults with disabilities. For example, Christian and Poling (1997) showed how two women with developmental disabilities learned to self-manage vocational tasks, which improved speed when working.

Despite the very frequent use of self-prompting as a strategy of self-management, the author found fewer self-prompting studies than those focused on self-monitoring and self-reinforcement. Self-prompts described in the literature take varied forms, including auditory, visual, and tactile cues. McDougall and Brady (1995) taught students to use tape-recorded cues to self-prompt self-assessment of study behavior. In the DRO study conducted by Newman and colleagues (1997), a kitchen timer was used to signal one-minute intervals for students to self-deliver reinforcement for the absence of behavior. Timers were used to set criteria for self-reinforcement for work completion in the study of self-management of vocational tasks conducted by Christian and Poling (1997). Visual cues have also been used to self-prompt, such as when pictures were used as transition cues to improve job independence (Sowers, Verdi, Bourbeau, & Sheehan, 1985).

Audio and visual cues have been demonstrated to be helpful in self-prompting, but there are drawbacks associated with each. Audio cues may be disruptive to others around the individual. For example, one could imagine a quiet classroom punctuated by a beeping or ringing timer at regular intervals. That timer might be helpful in keeping a student with ASD or another disability on-task without intervention from an adult, but it might also result in distraction and off-task behavior for that student's classmates. Visual cues are quiet and not likely to impact others, but they can be time-consuming to prepare and maintain, and may lose saliency (and effectiveness) over time. Both audio and visual cues are noticeable and may be stigmatizing in less-restrictive environments.

Fortunately, there are now choices of different ways to self-prompt. Some find that low-tech visual cues are beneficial, and many people with and without disabilities rely on prompts like written calendars and to-do lists, but there are now digitized alternatives that are easier to create, manage, store, and that may be much more appealing to the people who need to use them.

Similarly, for audio prompts, teachers can use the lower-tech strategies like recorded beeps and timers, but these are even easier and more discreet to implement with smart phones and other consumer devices. For example, a student wearing a Bluetooth headset might be prompted from a distance in community or job situations. Even just setting a regular alarm to remind oneself to do something or to self-monitor is pretty standard using the currently available consumer technology. While it might be odd to see someone self-prompting with a kitchen timer in a

classroom or work environment, it's perfectly natural to hear a smart phone chime quietly in one of those settings. Even better, smart phones can be set to deliver tactile prompts, which are virtually unnoticeable to anyone except the person who is receiving the prompt.

With the introduction of the MotivAider© 25 years ago, research has demonstrated that tactile cues such as vibrations can be useful for prompting in such areas as on-task behavior (Amato-Zech, Hoff, & Doepke, 2006; Legge, DeBar, & Alber-Morgan, 2010; McDougall, Morrison, & Awana, 2012), reducing problematic self-talk (Silla-Zaleski & Vesloski, 2010), and improving math fluency (Farrell & McDougall, 2008). While the MotivAider© is still a relatively inexpensive, useful, and discrete tool, tactile feedback is also available from other, even more convenient, sources, such as smart phones and smart watches. In fact, the MotivAider© technology is now available for download as a smart phone app.

Personal Digital Assistants (PDAs) are hand-held consumer devices that are readily available and fairly user-friendly. Current examples of PDAs include smart phones and tablets. Mechling, Gast, and Seid (2009) used Palm Pilots as PDAs to provide access to varied prompts to three adolescents with autism to increase independence in cooking. The participants were able to choose and deliver their own prompts – textual, pictorial, or video – on-demand as needed. All participants became more independent using this system, and in fact faded their own prompts as they were no longer needed.

PDAs were also used by Gentry et al. (2012) to provide access to self-prompting and other self-management tools to provide vocational supports for individuals with disabilities working in competitive employment. In this case, an Apple iPod Touch device was programmed by Occupational Therapists to provide individualized supports based on the particular job and the person's personal goals and preferences. Although not a formal research study, the case studies described by Gentry and colleagues support the use of PDAs to provide meaningful, personalized self-prompting tools to facilitate success in independent work for individuals with disabilities.

There may be advantages to using consumer technology to facilitate self-prompting for greater independence (Savage, 2014). Touch-screen mobile devices such as smart phones and tablets are highly accessible and appealing to just about everyone. Such mobile devices are particularly appealing to children and adults with disabilities, who may find them to be a more acceptable alternative to traditional, sometimes stigmatizing, assistive technology (Newton & Dell, 2011; Stephenson & Limbrick, 2015). Other benefits of consumer technology over traditional assistive technology are that consumer technology is relatively inexpensive, tends to be more durable and have a longer battery life, and can be used flexibly for more purposes than traditional assistive technology (Stephenson & Limbrick, 2015). Learners may also find technology-based supports to be more consistent, readily-available, and engaging than those provided by teachers or other support staff. Teachers may experience consumer technology as more user-friendly than assistive technology, and overall more efficient and easier to individualize than lower-tech teaching strategies. Finally, families and community members may find consumer technology to be easier to understand and interact with, and easier to support, when assisting or communicating with individuals with disabilities.

Of course, there are also drawbacks associated with technology in the context of supporting individuals with disabilities. Assistive technology, whether specifically developed for supporting those with disabilities or more readily-available consumer technology that is adapted for that purpose, shouldn't be used for its own sake, as a baby-sitter, or to replace social interaction (Newton & Dell, 2011). If the individual doesn't like technology, if it doesn't meet a particular need, and if it is more distracting than helpful, then technology shouldn't be used. Schools and agencies often purchase large quantities of devices without having a good plan for how to use them, resulting in wasted resources (Newton & Dell, 2011). Applications (apps) for consumer devices are also easy to buy impulsively, especially because they tend to be very inexpensive, but may not meet individual needs (Newton & Dell, 2011). Additionally, technology that is overly expensive or time-consuming to set up or use might not be appropriate for a given situation. For example, some individuals with ASD might find it easier and faster to simply jot a note on a post-it to remind themselves about an upcoming task or commitment, rather than programming an app to deliver a reminder. Whatever is most effective and most comfortable for the individual, and therefore most likely to be used, may be the best solution when choosing self-prompting strategies.

Even when technology is clearly appropriate and useful for supporting individuals with disabilities, obstacles may prevent effective implementation. Some reported obstacles to the use of technology with students with disabilities include lack of staff knowledge, access to adequate technology, and funding (Okolo & Diedrich, 2014). Tanis and colleagues (2012) add concerns with cost, issues with devices breaking, and lack of knowledge of what devices and applications would be most helpful as barriers to effective technology use. Future areas of research suggested by Stephenson and Limbrick (2015) include examining some of these issues, including those related to funding, as well as specific areas of application of technology for individuals with disabilities, comparisons of technology-based and traditional instruction, and use of technology by individuals with disabilities outside of intervention settings.

For individuals with ASD and other disabilities, self-prompting may be implemented, with or without technology, in two different ways. First, the teacher or other interventionist may set up the prompts, and provide any assistance necessary to teach the individual what the prompt means and how to use it. The second way to implement self-prompting is to teach the individual to set up the prompting strategies for him or herself. For some individuals, the concept of self-prompting may be taught as a skill set unto itself, and with proper instruction and support can generalize such that the individual sets up and responds to self-prompts in novel situations. Ideally, the individual will ultimately be able to follow a protocol such as that described by Clouse and Bauer (2016), in which individuals with intellectual disabilities are supported to set personal goals and self-management protocols for active engagement in self-determination.

Case Studies

Teacher-initiated self-prompting

Case study 1. Ian is a 4th grade student with ASD who participates in an inclusion class in his local public school. He usually forgets to leave the classroom for scheduled speech therapy.

Self-prompting strategy. Ian's teacher writes the time of his speech session on a post-it note each morning, and leaves it on his desk.

Outcome. Ian has learned to check the post-it note and to leave for speech on time without the teacher's verbal reminder. Ian's teacher finds this so helpful that she also begins to write the time of his music lessons on the post-it, and finds that Ian generalizes to leaving on time for music lessons as well, without the teacher's verbal reminder.

Case study 2. Lucy is a young woman with Down syndrome who works as a cashier in a neighborhood convenience store. Lucy sometimes forgets to count customers' change before handing it to them, occasionally resulting in a miscount of her register drawer.

Self-prompting strategy. The owner of the convenience store places a note inside the cash drawer saying "Count change 2 times!"

Outcome. Lucy begins to reliably count customers' change twice before handing it to them, resulting in fewer errors and a higher likelihood that her cash drawer is correct at the end of her shift. The owner of the store is pleased and offers Lucy more hours.

Case study 3. Phil is a teenager with multiple disabilities who is not writing his homework assignments in his agenda. He becomes upset when he gets home and doesn't know what to do.

Self-prompting strategy. Phil's parents set up several reminders in his smart phone, by programming his phone to vibrate five minutes before the end of each period. When Phil feels the phone vibrate, he looks at the screen to see a reminder that says, "Write down your homework."

Outcome. Phil begins to write down his homework in each class upon feeling the vibration of the phone and checking the screen. Gradually, Phil stops checking the screen and writes the homework just when he feels the vibration. Phil eventually self-fades the prompt by writing the homework before the reminder, and ultimately is able to delete the reminders from his phone and write his homework based on the usual cues to do so.

Student-initiated self-prompting

Case study 4. Joe is a young man with an intellectual disability who relies on his parents to wake him up at the correct time for school each weekday morning and for activities on the weekends.

Self-prompting strategy. Joe's teacher provides a lesson on how to set a cell phone alarm to the class. Joe is excited by this use of his phone and asks his parents to let him try waking up on his own. Joe sets his cell phone alarm clock each night before going to bed.

Outcome. Joe wakes up for school independently each morning. He adjusts the time of his alarm for weekend activities without prompting. Joe's parents no longer need to wake him up

for school or weekend activities. Joe generalizes this skill, and sometimes sets the alarm to remind himself when his favorite television show is about to start so that he doesn't miss it.

Case study 5. Fanny is a teenager with ASD who is working on using coping strategies to reduce frustration.

Self-prompting strategy. As Fanny learns each new coping strategy with her therapist, she writes it on a small card that she keeps in her pocket and references throughout the day.

Outcome. Fanny increases the use of coping strategies and decreases behavior that reflects frustration, like yelling or walking away. Fanny reviews the card each week with her therapist and updates it by removing strategies that she feels were ineffective, and adding new strategies as she learns them.

Case study 6. Becca is a 10-year-old girl with ASD who is learning to shower independently.

Self-prompting strategy. Becca's home support staff teaches her how to use a laminated, Velcro schedule. Becca learns to set up the schedule by ordering the pictures and hanging it in the shower prior to each time she takes a shower. After completing each step on the schedule, she removes the Velcro prompt for that step and puts it in a plastic bag. The last step on the schedule, after she dries herself, is to dry the pieces of the schedule and set it up for the next day's shower.

Outcome. Becca is independent in showering, and no longer needs her mother to stand in the bathroom and verbally prompt each step of the shower. Becca and her mother develop a similar schedule for brushing and flossing her teeth.

These examples show that self-prompting can be used by individuals with a variety of challenges, at different ages, and for different purposes. The examples also illustrate both high- and low-tech versions of self-prompting. For the most part, lower-tech versions of self-prompting are easy to set up and may be as simple as teaching an individual to manage the materials that have been used to prompt him or her by a teacher, parent, or other support person. Written notes, timers, and visual cues are commonly used in homes and educational settings. Taking the next step of teaching the individual to set up and respond to these cues independently brings them into the category of self-management.

Technology-based self-prompts may be more appealing and likely to be used by both individuals and those supporting them, however. As previously discussed, higher-tech interventions are often more acceptable and engaging, and have the added benefit of usually only having to be set up once. For example, an electronic activity schedule delivered on a tablet will not need to be re-created each time it used, the way a paper-based activity schedule may be. Table 1 suggests some currently available applications to facilitate various types of self-prompting.

Table 1
Suggested Applications to Facilitate Self-Prompting

Purpose of self-prompt	Tablet and smart phone apps
Reminder to start or stop doing something	iTunes: • Reminder & Countdown • Reminder, Alarm and Voice Reminders, Remind Me Google Play: • Countdown Days • Just Reminder Both: • Wunderlist (Apple Watch app available) • Cozi Family Organizer (Apple Watch app available)
Follow a sequence of events	iTunes: • Pocket Schedule – Class Schedule, Homework Planner • My Visual Schedule • Choiceworks • Children with Autism: A visual schedule (Apple Watch app available) Google Play: • myHomework Student Planner • First Then Visual Schedule • PictogramAgenda
How to do something or What to do in a specific situation	Both: • YouTube • WikiHow • Food Network in the Kitchen • Self-created videos/photos/written cues

Regardless of intellectual and linguistic ability, most individuals with disabilities can benefit from learning to self-prompt and use technology-based prompts to do so. Some key points to remember when teaching a student or adult to self-prompt are as follows:

- First, remember that the skill that you are teaching is self-prompting, NOT whatever the prompt is for. Therefore, a self-prompting program is not appropriate unless the individual has already mastered the skill that is being prompted. We don't use self-prompting to teach someone to cook independently while they are learning steps involved in cooking, but rather after they have learned those steps.
- Next, remember that self-prompting is a skill in and of itself that must be taught to many individuals. Simply setting up an app to remind the person to do something is not

teaching self-prompting. He or she may need intensive instruction in what to do when that reminder occurs, including how and when to "silence" or "snooze" the alert, how to follow through on whatever the reminder is prompting, and how to set up the reminder for the next time it is needed.

- Additionally, remember the distinction between teaching an individual to follow self-prompts that have been set up for him or her, and teaching the individual to set up those prompts independently. Both self-generated and other-generated self-prompts can be very meaningful in building independence, but obviously once the individual learns to set up his or her own prompts, the highest level of independence is achieved.
- It is important not to assume that self-prompting skills will generalize to different situations. Some individuals may need to be taught to self-prompt across a variety of contexts, such as home, school, and community, and across a variety of skill areas, such as self-care, academics, and social skills, before they begin to initiate and use self-prompting independently in new contexts and for new skills.

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About the Author

Dana Reinecke is a doctoral level Board-Certified Behavior Analyst (BCBA-D) and a New York State Licensed Behavior Analyst (LBA). Dana is an Assistant Professor and Department Chair of the Department of Special Education and Literacy at Long Island University Post. She is also co-owner of SupervisorABA, an online platform for BACB supervision curriculum, forms, and hours tracking. Dana provides training and consultation to school districts, private schools, agencies, and families for individuals with disabilities. She has presented original research and workshops on the treatment of autism and applications of ABA at regional, national, and international conferences. She has published her research in peer-reviewed journals, written chapters in published books, and co-edited books on ABA and autism. Current areas of research include use of technology to support students with and without disabilities, self-management training of college students with disabilities, and online teaching strategies for effective college and graduate education. Dana is actively involved in the New York State Association for Behavior Analysis (NYSABA), and is currently serving as President (2017-2018).

Meeting the Needs of Students with Disabilities: Characteristics of Universal Design of Instruction in Odds-Beating Middle Schools

Heather Kurto, M.S. Ed.
University at Albany

Kristen C. Wilcox, Ph.D.
University at Albany

Kristie Asaro-Saddler, Ph.D.
University at Albany

Abstract

In this multiple case study we examined six middle schools with above predicted student achievement outcomes on Common Core State Standards (CCSS) assessments in mathematics and English language arts. We drew upon the Universal Design for Instruction (UDI) framework to characterize the nature of teachers' practices with particular attention to how they approach instruction for students with disabilities (SWD). Through analysis of focus group interviews and observational field notes we 1) identified shared characteristics of UDI practices across all schools and 2) noted two schools with exemplary attention to three UDI principles: community of learners; flexibility in use; and tolerance for error. The exemplars provide evidence of how educators have shifted from a dichotomous understanding of abled/disabled to all-enabled through the use of UDI practices. This research offers implications for policy and practice by providing empirically-grounded findings regarding the nature of teachers' instruction for SWD in odds-beating schools.

Keywords. Universal Design for Instruction, Common Core State Standards, instructional practices, diversity

Meeting the Needs of Students with Disabilities: Characteristics of Universal Design of Instruction in Odds-Beating Middle Schools

Over the past several decades public schools in the United States have experienced a significant increase in the numbers of students with disabilities (SWD) they serve. For example, nation-wide statistics show that in the late 1970's approximately 8% of the total student population was identified as SWD, and that number has grown to over 12% in recent years (United States Department of Education, 2015). However, throughout this period, the persistence of physical, institutional, and attitudinal barriers for SWDs has inhibited their full inclusion and participation in school activities and, more broadly, in society (Pivik, McComas & Laflamme, 2002; Anaby, Hand, Bradley, DiRezze, Forhan, DiGiacomo, & Law, 2013).

Another trend identified in the research is one that suggests the over-representation of ethnically- and linguistically-diverse students (e.g. African-American, Hispanic/Latino, English language

learners) as SWDs (Artiles, Trent, & Palmer, 2004; Fletcher & Navarrete, 2011; Artiles, 2011; Harry & Fenton, 2016). Although contradictory findings have also been reported among some scholars (Morgan, Farkas, Hillemeir, Mattison, Maczuga & Li, 2015), the social stratification that promotes the identification of ethnically- and linguistically-diverse students as SWD has been a persistent concern. This over-representation has been attributed in part to norms of schools being aligned with the majority white and native-English speaking population and this systematic prejudice (not disability) correlated with suboptimal learning opportunities and academic achievement (Morgan et al., 2015; Wilson, 2017).

Such trends are set within a U.S. public school context characterized by waves of reforms intended to ensure all students equitable access to a rigorous curriculum (Partnership for 21st Century Skills, 2008). For example, the Common Core State Standards (CCSS) (i.e. a set of disciplinary college and career-readiness standards with cross-cutting themes[1]), data-driven instruction (DDI) (i.e. a system to use assessment data to inform instruction), and Annual Professional Performance Reviews (APPR) (i.e. formal evaluations of teachers' performance taking student achievement into account) were three key components of President Obama's Race-to-the-Top (RttT) policy reforms intended to ensure students, including SWD, are prepared for college or career. These reforms implemented in the early 2010's in states across the U.S., while expected to impact the instructional core of schools (what teachers teach and how students learn), nonetheless, left little guidance on how educators were to adapt their processes and practices to meet SWD needs (Wilcox, Lawson, & Angelis, 2017).

Thus, an important question was raised: How do educators in consistently better-performing schools meet the needs of a growing population of SWD in the face of policy changes intended to better prepare all students for college or career?

This study, as part of a larger mixed-method multiple case study, sought to identify the characteristics of processes and practices in middle schools with above-predicted student outcomes on state wide assessments, taking into account such demographic features as percentages of economically disadvantaged (a poverty indicator) and ethnically and linguistically diverse students served, which are all factors highly correlated with achievement outcomes (Goldsmith, 2011; Kena, Aud, Johnson, Wang, Zhang, Rathbun, & Kristapovich, 2014). The larger study was framed by social ecological theory (Bronfrenbrenner, 1993) that posits a relationship between individual performance and the proximal (e.g. classroom) and more distal (e.g. school and home) nested systems within which that individual exists.

Data collected in these schools, referred to as "odds-beating" schools because of their significantly better student outcomes on state wide assessments taking into account demographic factors, were analyzed using the Universal Design for Instruction (UDI) framework: This framework, as discussed in more detail below, includes nine elements intended to be used for planning and preparing classroom instruction accessible to all students. In alignment with this

[1] The CCSS include reading, writing, speaking, and listening standards in and across each discipline.. See explanation of cross-cutting themes at http://www.corestandards.org/ELA-Literacy/introduction/key-design-consideration/ . In New York State, the site of this study, CCSS were referred to as Common Core Learning Standards (CCLS) that included some differences from other states' CCSS.

framework, this study seeks to contribute insight into the elements of UDI in schools with odds-beating student outcomes with potential implications for policy, future research, and practice.

Inclusion in the U.S. Public School Context

Over 40 years ago, the Individuals with Disabilities Education Act (IDEA) mandated that SWD in U.S. elementary and secondary schools be educated alongside their peers in inclusive environments. A synthesis of research concludes that the most common environmental barriers to student participation and inclusion were attitudes, physical environment, transportation, policies and lack of staff support (Anaby et al., 2013). In discussing the inclusion of students, Graham and Slee (2007) raise the lingering question of what exactly students should be included in and what they should be excluded from and why. This sticky question extends beyond SWD to other groups of students (e.g. socioeconomically, ethnically, and linguistically diverse) and has been approached in the U.S. as a major social justice issue (Messiou et al, 2016). Nonetheless, many teachers still are not adequately prepared to work with diverse populations, including SWD, in inclusive environments (Allday, Neilsen-Gatti, & Hudson, 2013). Wilson (2017) characterizes the regular education classroom as "constructed for a mythical, 'able-bodied' neurotypical norm that neither reflects nor accommodates the wide range of diverse learners within it" (Unpacking Inclusive Education, para. 8). As a result, SWD are frequently not offered access to the general curriculum in a way that is meaningful and appropriate to their needs. For example, SWD are often placed in learning environments that promote drill and practice and suppress meaningful learning experiences, which in turn have the potential to stifle intellectual and social and emotional growth (Gallagher, 2004).

Some scholars have noted that the ability for SWD to receive instruction from content area specialists in mainstream classroom settings increases their successes with academic and social tasks (Katz & Mirenda, 2002; Hunt & Goetz, 1997; Feldman, Carter & Asmus, 2016). In alignment with this research, IDEA mandates that SWD have access to and progress in the general education curriculum (United States Department of Education, 2015). However, both "access to the general education curriculum" and "progress" are loosely defined terms open to a number of interpretations (Hollingshead, Carnahan, Lowrey & Snyder, 2017). Agran, Alper and Wehmeyer (2002) surveyed teachers who expressed little clarity about the policies and procedures for ensuring "access". Teachers reported not having clear direction on how to involve students in general education curriculum and activities (Agran, Alper & Wehmeyer, 2002). Additionally, the appropriateness of skills targeted in the general education classrooms were a source of contention between special and general education teachers (Agran, Alper & Wehmeyer, 2002). The term access also takes into account where instruction is taking place. Access to the general education classroom and curriculum by SWD alone does not provide the same educational experience as it does for students without disabilities (Dymond, Renzaglia, Gilson & Slagor, 2007). Additionally, special education teachers may provide access to the general education curriculum, but in self-contained programs where the special education teacher is the primary instructor, they may not have the formal training and content knowledge of their general education peers creating confusion especially for students with significant cognitive delays (Petersen, 2016). Clarity is needed about the definition of access and how to ensure this access for SWD (Petersen, 2016). This raises the question of whether attending the same schools

as non-disabled students and physically attending general education classes in those schools is truly "access" (Ryndack, Jackson & Billingsley, 2000).

The term "progress" is also not clearly defined and translated into procedures and practices. While, the general education curriculum is ostensibly based on CCSS that delineate the content that is to be learned, for SWD opportunities are needed to develop social and vocational skills as well. These divergences in the conceptualizations of what a general education curriculum should set as aims are problematic. As some scholars have pointed out (Turnbull, Turnbull, Wehmeyer & Park, 2003), teaching a curriculum that is strictly academic or one that offers a combination of academic and life skills that include social involvement, achievement of personal attention and a sense of well-being, have important implications for how the "progress" of and for SWD is monitored.

Conceptual Framework: Universal Design for Instruction

One way of conceptualizing the ways curriculum and instruction can be informed by students' differences is Universal Design for Instruction (UDI). The UDI framework is increasingly being promoted via federal legislation in the United States (Ferri & Ashby, 2017). UDI branched off of the work of Mace (1998), who used the term Universal Design (UD) to characterize how community environments could be designed to meet the variety of physical needs of its citizens (McGuire, Scott & Shaw, 2006; Edyburn, 2005) and the Universal Design for Learning (UDL) principles (Edyburn, 2005), which sought to apply UD to educational contexts. UDL principles, listed as 1-7 (see Table 1), include: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort and size and space for approach and use. UDI consists of these same principles, and include two more listed as 8 and 9 (see Table 1): instructional climate and community of learners. These nine principles have been identified in research to help reduce barriers and increase access to learning environments and broaden the scope of teaching practices and assessments to representations, expressions, and engagement with the content, for both student and teacher (Scott, McGuire & Shaw, 2006; Edyburn, 2005).

Table 1
Universal Design for Instruction Principles

UDI Element	Definition
1. Equitable Use	Instruction designed to be useful and successful for diverse students
2. Flexibility in Use	Provide choice and method for use
3. Simple and intuitive Use	Straightforward instruction
4. Perceptible Information	Information communicated effectively despite ambient conditions
5. Tolerance for Error	Instruction anticipates variation in learning pace and prerequisite skills
6. Low Physical Effort	Instruction designed to illuminate nonessential physical effort
7. Size and Space for Approach and Use	Instruction is designed regardless of students' physical needs
8. Instructional Climate	Inclusive and high expectations for all students
9. Community of Learners	Instruction and communication between teachers, students facilitated and promoted

Few studies have empirically examined the use and effectiveness of UDI. One study by Scott, McGuire and Shaw (2006) is based on a qualitative analysis examining the effectiveness of UDI from the perspective of postsecondary students. The attention of the focus groups was on the qualities of good teaching and methods that promote learning (Roberts, Park, Brown & Cook, 2011). The report of student's perceptions of good teaching aligned with UDI elements, particularly instructional climate, community of learners, equitable use and flexibility in use (Embry, Parker, McGuire & Scott, 2005; McGuire and Scott 2006).

UDI has been used as a planning tool in the form of professional development to increase teachers' awareness about obstacles to students' learning (Roberts, Park, Brown & Cook, 2011). Spooner, Baker, Harris, Ahlgrim-Delzell and Browder (2007) analyzed teachers' lesson plans before and after a one-hour training session on UDI and found that lessons plans were more accessible post training. Researchers who have analyzed the use of UDI as a tool for pre-service teachers and in-service teachers found that the use of UDI holds the potential to expand teachers' knowledge of students' abilities, to assist in teachers' incorporation of that knowledge into lesson design, and to increase the inclusiveness and success of all students (McGuire-Schwartz & Arndt, 2007; Roberts, Park, Brown & Cook, 2011; Spooner, Baker, Harris, Ahlgrim-Delzell & Browder, 2007; Zhang, 2005)**.** Additionally, researchers have noted a recent surge in the use of UDI/UDL as a framework to create and evaluate online courses in meeting the diverse needs of the student population in online learning communities (Robinson & Wizer, 2016; van Rooij & Zirkle, 2016; Proceedings from Dalton & Berquist, 2016).

The possibilities of UDI to inform policy, future research, and practice with regard to SWD is a relatively under-investigated area of research in middle schools. Thus, with the following

research questions, we introduce the methods employed to make just such a contribution: (1) What UDI elements do teachers in odds-beating middle schools express are of import as they plan and implement instruction in the context of college and career ready standards (i.e., CCSS)? (2) What UDI elements are evidenced in these odds-beating middle school classrooms?

Method

The larger mixed-method multiple case study, from which this embedded study emerged, was conducted by the NYKids project[2] at the University at Albany's School of Education. It was intended to investigate the impacts of RttT reform implementation (i.e. CCSS, DDI, and APPR) in a variety of schools with different student performance outcomes. For the larger study, a statistical method called regression analysis (Levine, Stephan, & Szabat, 2013) that facilitates the identification of a sample of schools based upon a set of achievement and demographic criteria was used. The results of regression analyses are displayed in Table 2. The Z scores illustrate that the odds-beating schools' students scored significantly better (>1 standard deviation above the mean) on ELA and mathematics CCSS assessments in comparison to students in other public schools taking into account such student demographic factors as poverty and diversity (both highly correlated to student outcomes) (Goldsmith, 2011). Notably, these schools fell into the typical range for the percentages of SWDs served (between 10 and 15% of the overall population in comparison to the NY average of 13%).

Table 2
Characteristics of Participating Middle Schools

Odds Beating Schools	% of Students with IEP's in district	% Economically Disadvantaged Students	% White Students	Total Enrollment	Per-pupil Spending	Average Z Residual Range
Hutch Hill[3]	10-15%[4]	17-40%	>90%	>770	<$18K	< 1.00
Julesberg	10-15%	17-40%	<75%	>770	$18-22K	1.00-1.50
Laribee	10-15%	<17%	75-90%	770-450	<$18K	2.00<
Roaring Gap	10-15%	17-40%	<75%	770-450	$18-22K	1.50-1.99
Ruby	10-15%	>40%	>90%	<450	<$18K	2.00<
Sage City	10-15%	>40%	<75%	770-450	>$22K	<1.00
Average for NYS	13%	30%	79%	650	$20K	

[2] Details about this publically-funded project as well as other research results can be found at:

https://www.albany.edu/nykids/

[3] *All school names are pseudonyms to protect the identities of participants*

[4] *All numbers are provided in ranges to ensure anonymity*

In deciding the sample of schools, the research team also took into account performances on the state's high stakes exams prior to the implementation of the CCSS. Thus, all of the odds-beating schools selected also satisfied the criteria of having met Annual Yearly Progress (AYP) achievement targets (a New York State measure of performance) for all populations of students including SWDs over a three year period leading up to the implementation of the CCSS.

With concern for contextual variance among schools, this sample was purposefully balanced with schools in urban, suburban, and rural settings as well as those with larger and smaller populations of diverse students. Detailed descriptions of each of these schools are available publically on the NYKids website (see https://www.albany.edu/nykids/64499.php.) and in Wilcox, Lawson, and Angelis (2017).

Data Collection

In site visits to the six odds-beating middle schools we collected documentary evidence (e.g. lesson plans), conducted semi-structured focus groups with district and school leaders and teachers, and conducted classroom observations. In this embedded study, we focused specifically on teacher focus group data and the observations since we were interested in how teachers described their practices, the reasons for engaging in those practices, and how those practices were enacted in classrooms.

In the focus groups, participants were offered opportunities to describe their practices and also express challenges they face in meeting SWD needs. The semi-structured focus group protocol included such questions as*: To what extent do you feel you have enough and appropriate resources to achieve success for your students?; What would you consider to be high-quality classroom instruction? How are these instructional strategies aligned with CCSS?; How do you plan for instruction?; How do you monitor students' performance; What kinds of opportunities do you have for collaboration in this school?; How is this collaboration supported and sustained?*

The observation protocol (see Appendix A) was designed to yield thick descriptions of instructional practices, particularly as they related to CCSS. To do this, the protocol included open-ended field notes, a debriefing section wherein teachers were prompted to share reflections after their lesson had been observed, as well as sections to record classroom interactions and summaries of such things as types of activities, assessments, and materials used (Adler & Adler, 1988).

Data Analysis

Data analysis for this study occurred in phases.

Phase 1

Analyses for the larger study began onsite as each team member contributed to interpretive memos during and immediately after data collection. Next, all data were loaded into the qualitative software program NVivo (QSR International) at which time analysts, who were trained in the use of the a priori codes informed by the literature, coded the data. For example, one set of a priori codes centered on instructional practices; others included student social-

emotional health, organizational adaptations to student population, and student engagement strategies.

After all data from the larger study were coded and the summary reports and case studies crafted, the case studies were shared with superintendents and principals, who were asked to check the reports for accuracy and the credibility of the interpretations. Upon the review of feedback that in most cases included only minor adjustments to such things as acronyms, the case study and cross-case reports were finalized.

Phase 2

In the current study, focus group transcripts, encompasing the voices of a total of 153 participants, were again analyzed to respond to research question one and classroom observation field notes were analyzed to respond to research question two. In alignment with our objective to identify UDI practices in these odds-beating schools, after initial review of the observation data, we focused a second cycle of coding on eight classroom observations in two of the odds-beating middle schools (Hutch Hill and Ruby) that were exemplary in their evidence of attention to three UDI principles: community of learners; flexibility in use; and tolerance for error (Meyer & Rose, 2000; McGuire, Scott & Shaw, 2006; Karger, 2005; Wehmeyer, Lance & Bashinski, 2002) (see Appendix B for codebook). Finally, the UDI-coded observation data, case study, and cross-case reports were reviewed to identify patterns across cases (Miles, Huberman, & Saldaña, 2014).

In sum, interpretive memoing (i.e. recording interpretations throughout data collection and analysis), member checking (i.e. confirming accuracy of evidence and interpretations with participants), and source triangulation (examining multiple data sources intra- and cross-case) methods (see Maxwell, 1996; Patton, 2001) recommended for multiple case studies were employed to ensure the credibility of findings (Creswell, 2014; Yin, 2013).

Findings

As a preview to our findings, while we identified characteristics of all nine UDI elements in the schools studied, in only two schools (Ruby and Hutch Hill), did we find the following UDI elements salient in classroom observations: (1) facilitation of a community of learners; (2) flexibility in use; and (3) tolerance for error. These particular elements reflect the proactive design of instructional activities and environments to create inclusive learning environments that are particularly salient for SWD and hold implications for policy, future research, and practice, as we will discuss in the conclusion.

Instructional Climate

Educators strongly emphasized instructional climate as characterized by inclusivity and high expectations for all students. For example, in every focus group, we identified data wherein teachers referred to the import of all students meeting their goals and reaching their potentials. Teachers also addressed characteristics of the instructional climate when discussing their district's goals. For example, a teacher from Ruby stated, "Success is really when we are able to deliver an education that results in high levels of achievement for all students." In these discussions responses to questions regarding district goals for student success included statements pointing to the import of "providing services to all students, centered and focused on

students and the needs of all students". Teachers also expressed that the overarching goal of their districts' work is to provide a set of clear expectations for achievement for all students without exclusion. A special education teacher from Laribee explained, "We want every student to be successful in the classroom and in any classroom that they're in and in any program that they are in. So we work with the regular education teachers to see that happen".

A positive instructional climate was exemplified in observations as well as described in focus groups. For instance, teachers at Ruby and Hutch Hill were observed using a variety of strategies (playing cards, tossing a ball, and using electronic devices) to ensure full participation of all students in classroom conversations. In most instances the teachers were observed praising students for their participation. In one particular classroom in Hutch Hill, the teacher was observed supporting broad student participation by targeting specific students with a supportive conversation before the students were asked to respond.

The focus group data provided evidence that teachers in these odds-beating schools held high expectations of students. Furthermore, they express the belief that they hold responsibility to craft a positive instructional climate for all students to meet their potentials.

Equitable Use

Equitable use, as described by McGuire, Scott and Shaw (2006), pertains to instructional practices designed to be useful and equivalent for all students with diverse needs. The CCSS, as a set of disciplinary standards with cross-cutting themes, naturally invites opportunities for all teachers to share common language, methods, and instructional strategies, and provides a starting point to provide equal content to students through means that address individual's needs (McGuire, Scott & Shaw, 2003).

With regard to equitable use defined in this way, the teachers in this study discussed activities that "excited and engaged" learners. They used activities that would promote student engagement including those that included hands-on elements and technology such as Chrome books and iPads. In Roaring Gap, for example, an administrator explained, "I think as I'm sure you've noticed we have students from various backgrounds and I think teachers at this district have really developed a fine craft in being able to develop instruction for all of the different types of learners." As an example, we observed English Second Language (ESL) and mainstream classroom teachers in an ELA class at Julesberg middle school presenting a lesson on craft and structure in writing using a variety of texts and technologies. These teachers tasked students with accessing their iPads to listen to a popular pop song and through this engaged them in identifying literary elements, such as character. The teachers were able to connect this accessible activity to a poem in order to teach literary elements. They provided what was observed as an engaging instructional activity while differentiating the instruction to meet the needs of all students. When asked how the CCSS implementation impacted teaching practices, overall teachers, such as this one from Hutch Hill, responded, "that it's allowed me to diversify my teaching a bit to different levels of kids."

In general, teachers at Ruby described a consequence of aligning their instruction to the CCSS as facilitating "diversified teaching", as exemplified in the use of hands on and technology-enriched

instruction, and raised accountability of "lower functioning kids…asked to achieve at the same level as the general education kids."

Flexible Use

Flexibility in use focuses on the design of instruction taking into account the needs of a diverse population of students with a wide range of individual abilities. This UDI principle focuses attention on the qualities of the learning environment including the way curriculum is accessed, how students engage with that curriculum, and how their learning is assessed.

With regard to flexibility in use, teachers described how they modify instructional resources and instruction and this was, importantly, supported by administrators. General education teachers, for example, discussed the use of modules (a set of CCSS-aligned lessons made available online through the New York State Education Department) noting their usefulness, but also the need to modify them: "What we do is when we get the units, we use them, we implement them and then we analyze them and look at which aspects of these units do we think help our kids become more successful and then we incorporate them into our district curriculum".

Administrators' encouragement of teachers to modify CCSS materials contributed to a tailored approach to instruction. A teacher from Sage City explained, "We don't follow step by step the Common Core, but we definitely refer to it and look at it and we have made some adjustments." This example illustrates a larger pattern that teachers were encouraged by administrators to tailor their instruction to meet the needs of their student population as they adapted their instruction to align to the CCSS. A teacher in Ruby reported that the school principal had given teachers the freedom to tailor their instruction to best meet the students' needs: "You don't have to teach these modules. I trust you to teach this the way that you need to teach this." This measured accountability was set within school environments where teachers expressed understanding the import of making meaningful connections between the curriculum and their students . In discussing the benefits of flexibility in achieving this aim, a teacher from Hutch Hill described a shared philosophy about instruction at her school: "They key is to make it interesting, to make it fun and to make it relatable … to bring in real life and to make it interesting and current."

Another consideration with regard to flexibility of use evident in the schools studied was with regard to assessment strategies utilizing multiple measures. In a grade 6-math lesson at Hutch Hill, for example, a teacher asked students to compare rates and quantities. The teacher utilized a small group activity to walk around the classroom and informally assess the understanding of the content for each student. Likewise, in a grade eight math lesson at Ruby a teacher utilized questioning to probe students thinking and provided individualized feedback in the assessment of their work.

In sum, administrators' encouragement of teachers to not follow CCSS materials "step by step" and to create "engaging and relatable" student activities allowed teachers to adapt to their students' needs. Overall, these school contexts afforded teachers the opportunities to design instruction and materials, and assess what students know in flexible ways.

Community of Learners

The UDI principle regarding communities of learners focuses attention on instruction and curriculum designed to encourage and promote student-to-student and student-to-teacher interactions. In the odds-beating schools in this study, we noted a number of instances where teachers encouraged student-to-student interactions within classrooms, but also encouraged students to engage in after school activities and clubs as well.

In promoting student-to-student interactions within the classroom teachers described instructional strategies that encouraged partner or group interactions. As an example, a teacher from Laribee stated, "When they [students] are in groups their peers are self-checking them, and the more talk you hear you go over and maybe intervene a little bit to make sure that they're explaining and helping each other. I feel like they do such a great job helping each other to stay on task and keeping each other informed." In Roaring Gap a teacher provided further evidence of the import of student-student interactions in the classroom:

> *Within their [students'] learning partnership, they become comfortable in working with the same person and they feel comfortable in sharing. And it's not about being right or wrong. It's about being an active listener and hearing what that person has to say and relating it to the task at hand.*

Interactions between students and teachers were also reported to be an important element to teaching. A teacher in Roaring Gap explained, for instance,

> *We kind of loop with our kids. So, you know we follow them throughout the middle school. We know what their needs are before the year even starts.*

Hutch Hill teachers also emphasized the import of nurturing student-teacher connections. For instance one teacher explained how important it is to " …really getting to know our students and identifying any barriers or obstacles that may be impeding their success and collaboratively partnering with parents… with all stakeholders, and the student – himself or herself".

The importance of nurturing a community of learners was exemplified in the observations as well. Students were observed working collaboratively in groups and interacting with teachers to expand their understanding of content. Observations of a grade eight mathematics lesson in Ruby Hill, for instance, provided evidence of student-to-student engagement. Students sat in pairs and used their partners to check for understanding of comparing numbers in scientific notation. The teacher presented the students with a problem and then instructed students to "confer with your partners." When a solution to a problem was presented the teacher again instructed the students to, "check and compare with your partner." In Hutch Hill students were observed working collaboratively in seventh grade ELA class about writing character sketches utilizing the specifically taught method. The students participated in a round robin writing activity whereby every two minutes a timer would sound and students would pass their work to a peer. The teacher set a goal of 100% participation and on task behavior.

Teachers also pointed to the importance of after school activities in promoting student-student and also teacher-student relationships. A Hutch Hill teacher explained,

> *They're more connected to school, more invested, and they'll feel more important, more likely to do …and sometimes I think it's a motivational piece for a student whether its sports or a club; if they're involved in that sport they're probably more likely to be invested in academics.*

The UDI principle of community of learners emphasizes the importance of relationships of student to peer, student to teacher, and student to content. A community of learners was supported in the odds-beating schools through the facilitation of conversations between peers, making personal connections with students and teacher, and in providing motivation for students to connect to the teachers and each other outside the classroom.

Size and Space for Approach

This principle takes into consideration the appropriate size and space for approach, reach, manipulations and use that are accessible to a variety of physical, mobility and communication needs (McGuire, Scott & Shaw, 2006). Teachers reported designing instructional activities to promote group collaboration, hands on activities and address real world problems. Learning activities in Hutch Hill incorporated collaboration and hands on activities,

> *I have to say that the [modules] do have a lot of hands-on that we adapted today as an example; instead of a typical review sheet we might have done in the past, we have them at the board and we're making pumpkin relays…We make up some of our own games.*

Laribee also discussed a shift in instructional activities,

> *When we were doing that unit … we had a space that we were able to accommodate both classes. So it was differentiated in that sense to kind of make sure that all students' learning objectives were being met, we were also available to provide support for students that needed it.*

Evidence of size and space was observed during classroom instruction. The integration of technology, small group instruction, station work and visuals to support seemed to provide variation in physical space for instruction and a variety of manipulative resources to support the needs of the learners. One teacher at Hutch Hill was observed using timed sessions to work in groups to solve rate problems. The teacher used collaborative grouping to reduce the size of the group and to shift the lesson from a teacher centered approach to a student-centered approach. The timed sessions created a sense of focus and the group work promoted collaboration and shared understanding and mastery of content

These conversations and observations display the teacher's abilities to address the CCSS through meaningful activities that were able to meet the diverse needs of the learners. The design of meaningful activities through size and space for approach allows for engagement with content promoting intellectual growth.

Low Physical Effort

The principle of low physical effort refers to instruction that is designed to maximize attention and learning by minimizing nonessential physical effort (McGuire, Scott & Shaw, 2006). This principle, discussed by McGuire, Scott and Shaw (2006), is in reference to assistive technology and time for learning, with discussions specifically centered on iPads, smartphones and other devices that aided in student learning.

Focus groups at Hutch Hill mentioned the use of technology in research stating, "They are doing their projects, investigating what they need to investigate using the Chrome books." There was a discussion about assistive technology having the ability to "level the playing field" for some students. In Ruby there was discussion about a field sound system: "The field sound systems we've had on some of the students' IEPs. For some with auditory processing issues, all students benefit from this." In observations at Roaring Gap, Julesberg, and Ruby teachers used the assistance of technology in lessons. Devices such as an Elmo, Chromebooks, iPads and Smartboards were used to display visual supports, goals for the class and modeling of tasks to be completed. The use of technology was beneficial support for all students because it provided supports for multi-modal presentations without the need for extensive physical effort.

The principle of low physical effort accommodates SWD but may have positive outcomes for all students. The use of technology with intention can provide the students the tools that they need to engage with content instead of dealing with the barrier to the content. The use of a word processing program, for example, will help a student engage in the writing process instead of being held back by the physical ability to write.

Simple and Intuitive Use

Simple and intuitive use refers to instruction that provides clear directions and expectations. (Wehmeyer, Lance & Bashinski, 2002). For example, the use of study guides may help all students understand the content to be covered and the expectation of knowledge to be attained (Wehmeyer et al., 2002). Such guides were discussed by teachers in helping students acquire strategies for organization and to meet the demands of a lesson. Teachers at Ruby, for instance, discussed the importance of providing good models for organization.

> *I feel that our job is to help get organized so that by the time they get into high school that they have good working habits and find the materials that they need and complete their work, we're like their building block too because of the skills that they need to have, the knowledge they need to have to go in, so then they can be on the right track, they can graduate on time, find a good job, enter the college they want or whatever path they find.*

Another teacher at Ruby stated, "We try to use strategies in the classroom that will be useful for them and if it's going to benefit them, it's going to benefit everyone" demonstrating the benefits that simple and intuitive practices have for all students. An observation in a seventh grade technology class in Laribee provides an example of how simple and intuitive practices can benefit all students. The technology teacher provided the students with an overview of the class and prepared the students with the equation needed to calculate the efficiency of the bridges they built. The teacher also provided a set of steps the students needed to engage in to be successful

for the lesson. A definition of success and check-ins with the students by the teacher ensured students understanding of what they need to do and how they would achieve their goals.

Designing instructional practices and environments to embrace simple and intuitive elements may lead to increased independence and competence for all students. The use of study guides and helping students organize materials provides students with an opportunity to engage in classroom activities instead of being hindered by a lack of preparedness to engage in classroom activities and assessments.

Tolerance for Error

Tolerance for error accounts for student's prerequisite skills and pacing for learning (McGuire, Scott & Shaw, 2006), and provides feedback for students while also allowing time and space for practice. There were a variety of programs discussed in the interviews and focus groups in each school that allotted for extra time in the school day or beyond the school day to assist with students understanding of content in classes where they needed additional assistance. These extended opportunities are allowing for teachers to provide students with feedback to increase understanding and mastery of content. These odds-beating schools used "failure" as an opportunity to teach. For example, in Roaring Gap, educators developed opportunities for students to come before or after school to receive support in all academic areas. Tolerance for error is also demonstrated in the movement and engagement of teachers in the observations, with students to provide them guidance and feedback on content. In classroom observations there were many similarities in lesson structure that included a "bell ringer" (also known as a warm up activity), guided practice, and independent practice that each provided the teacher opportunities for feedback on the students' work. The teachers at Roaring Gap were observed moving around the room, checking student's work and conferencing with students. Observations in both Ruby and Hutch Hill noted students working as a whole group to engage in content and then individual work to practice the content, while each teacher provided students with feedback on engagement with content.

Tolerance for error makes failure a positive experience for all students to learn through feedback and opportunities to practice. SWD need these spaces and opportunities to engage with content through meaningful learning activities with opportunities to explore and learn from errors.

Perceptible Use

Instructional design that that takes into account the principle of "perceptible use" offers a variety of formats and presentations to meet the learner's needs (Wehmeyer, Lance & Bashinski, 2002). The utilization of visual, auditory and tactile presentations of information that is easily consumed will meet the needs of a variety of learners.

Academic Intervention Services (AIS), services that supplement general curriculum or provide services needed to confront barriers to improve academic performance (New York State Education Department, 2016), is format of delivery of instruction being used in odds-beating schools to help more diverse learners achieve higher levels of performance in the classroom and on state assessments. "We don't let anyone fall between the cracks. We go through every single child that we can," said a teacher in the AIS Laribee focus group. In addition to AIS, differentiation is often used to help meet diverse learners' needs. In Hutch Hill, for example, a

math teacher discussed using different presentations of materials to differentiate the lesson stating, "In one station there was a video…they talked to us in the hall about their understanding…we read about it and the third station was, as I said, and interactive field trip through Google Field Trips." Another math teacher discussed differentiating by "infusing eighth grade topics into the 7th grade topics" to expose students to different ways of thinking about math. A teacher from Hutch Hill discussed their approach to teaching that creates a more student-centered approach which better meets the individual learners needs, and offers a variety of formats and presentations,

> *When they need me, we go to question, stop and mini-lesson on a topic. At that point they're engaged, they want to know at that point, so they're more likely to listen rather than me lecturing about something. So I find tying to be a facilitator whenever I can, step back and not be the center of attention in the room, being the resource that's kind of roaming around to say "What do you need from me?"*

Students have different levels of knowledge experiences, and sensory perceptions that benefit from different modalities of presentation addressed through the element of perceptible use. The use of Chromebooks in a math lesson at Roaring Gap middle school is an example of how different modes of presentations can benefit the learners. The teacher engaged the students in a lesson about distance and range using the Chromebooks to practice the utilization of operations and strategies to solve problems. The students worked in groups to solve math problems and share what they had learned. The variety in format (Chromebooks) and presentation (group work) provided a lesson that was easily consumed by the learners.

Perceptible use demonstrates the teacher's ability to use different modes of presentation through differentiation and support services to meet the learner's needs that may lead to greater access to the curriculum for all students.

Limitations

It is important to note that the schools selected in this study are not meant to represent all middle schools where RttT reforms were implemented in the United States, but rather were selected in order to highlight the kinds of practices that are related to different performance outcomes on Common Core assessments in one state and in a set of schools that represent relatively better-case scenarios for student outcomes taking into account demographic factors. If we used different selection criteria we may have have found evidence of different emphases in UDI practices. In addition, some of our findings are based on focus groups, and rest on the assumption that educators answered questions accurately and honestly. Finally, as the larger study in which this one is embedded did not focus specifically on instructional strategies for special education students, more detailed descriptions of practice are not available and will require additional research.

Discussion

In alignment with the UDI framework, this study sought to contribute insight into the elements of UDI in schools with odds-beating student outcomes with potential implications for policy, future research, and practice. To do this, we examined how educators meet the needs of a growing population of SWD in the face of increasing demands for student and teacher performance vis-à-

vis college and career-ready standards. The UDI framework was beneficial in characterizing teaching practices that meet a heterogeneous student population. Further, our findings suggest that it is not the CCSS curriculum or DDI and APPR policies that drive instructional practices, but the understandings about what is important in the design of instruction and instructional spaces in classrooms and schools to push all students to achieve.

Investigation of the nine elements of UDI leads us to further question how educational practices are promoting a learning environment that embraces the abilities of all students. The presence of UDI practices, specifically flexibility in use, equitable use, instructional climate and community of learners, noted in lesson design and instructional practice of teachers suggests the possibility that the labels of abled versus disabled can shift to an idea of enabled for all students, leading to a positive response to student diversity (Messiou et al., 2016). UDI may promote the enablement of students to equally access the curriculum through environmental adaptations and teaching practices that are proactive. These elements are all seen as having potentially a positive impact on promoting higher achievement on assessments and overall outcomes for students (Scott, McGuire & Shaw, 2006; Edyburn, 2005).

Examples of the integration of the Common Core Learning Standards with instructional practices and instructional spaces suggest that the standards may act as a guide for academic achievement, but educational practices and strategies used at the district, school and classroom level - such as differentiation of instruction through the nine elements of UDI (Embry, Parker, McGuire & Scott, 2005) - may have a stronger impact on student achievement than federal and state mandated policy. Designing classrooms and learning environments to meet the diversity of our student population with intention to instructional strategies, integrated services, and engaging activities (Zigmond, 2003) may benefit all students. Intention or purpose of design to environmental spaces, instructional strategies and how we service students increase access to education for the widest range of students possible, which is a goal of universal design (Mace, 1998). With increased expectations and access for SWD, use of UDI principles has the potential to increase quality of life for all students.

Although it is important to discuss the elements gleaned from the observational data, it is also important to discuss what was missing from our observations. While there were three elements of UDI (community of learners, flexibility in use and tolerance for error) prominent in our observations, the other six elements of UDI (instructional climate, size and space for approach, equitable use, simple and intuitive, perceptible information, and low physical effort) were less notable. This invites further inquiry to address the awareness of UDI by teachers and administrators, and the potential of UDI as a framework to inform practice. Broderick, Mehta-Parkh and Reid (2005) suggest that responsive lessons designed to meet learner diversity, as opposed to the modification of lessons to meet individual needs, can open up classroom activities to engage students in meaningful learning experiences. This engagement can be achieved through the use of reflection, awareness of current practices, examination of physical and social-emotional spaces, and exploration of teacher attitudes (Broderick, Mehta-Parkh & Reid, 2005; Roberts, Park, Brown & Cook, 2011).

Future research should focus on how teachers and school districts promote and design school spaces for collaboration and planning to design learning environments that meet the diversity of

learners. Stepping into the role of the student through interviews and focus groups and considering variation in teaching strategies to meet the diverse needs of learners from the user's perspective, versus that of the designer's, may lead to more positive learning practices for both teachers and students (Altay, Ballice, Bengisu, Alkan-Korkmaz & Paykoc, 2016). Future research should also examine how collaborative efforts (e.g., co-teaching) and teacher roles have an impact on planning and preparation utilizing a UDI framework.

Exploration of UDI as an intervention in diverse and lower achieving classrooms may provide support on how to mediate learning environments to meet the diversity of learning populations; specifically, how the use of UDI and other elements of universal design can remediate classrooms in which teaching practices and learning environments are not meeting the needs of special education students. Increased qualitative studies that offer intentional observation data on elements of UD may provide insights on how classroom environments may be proactive or reactive in mediating classroom diversity. This research would aid in the reforming of educational design to meet the growing needs of the growing diversity of students.

In conclusion, the increased awareness of student diversity has the potential to positively inform our instructional practices and establish educational environments that are tolerant and accessible. UDI can inform our reform initiatives and policy to not just push high performance on assessments, but to create an equitable educational system that enables all students, allowing them to achieve their fullest potential academically, socially and emotionally.

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About the Authors

Heather Kurto is a doctoral student in the Educational Theory and Practice department at the University at Albany and works full time as a special education teacher in the South Colonie School District in upstate New York. Ms. Kurto's research interests focus on autism, instructional technology, and professional development around Universal Design of Instruction. Ms. Kurto earned her Certificate of Advanced Study in Curriculum Development in addition to her Master of Arts from the University at Albany, State University of New York in Special Education, Reading and Curriculum Development and Instructional Technology.

Kristen Campbell Wilcox is an Associate Professor in the Department of Educational Theory and Practice where she teaches research and teaching methods courses. Her research interests focus on the influence of national and state policy on educational outcomes, especially in linguistically and culturally diverse contexts. She has published her research findings in such

journals as Education and Urban Society, Journal of Students Placed at Risk, Journal of Educational Change, Teachers College Record, and Peabody Journal of Education.

Kristie Asaro-Saddler, Ph.D., is an Associate Professor in the Department of Educational and Counseling Psychology and the Director of the Division of Special Education at the University at Albany. Her research interests focus on instructional practices for students with autism spectrum disorders (ASD), specifically in the areas of writing and self-regulation. She has published her research in journals including Exceptional Children, Journal of Special Education, Remedial and Special Education, and Exceptionality and has presented at national and international conferences in the area of writing.

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Appendix A. Observation Protocol

Observer:
Date:
School:
Grade: /# of students:
Time:

Notes: (Inclusion, ESL push in):

Part 1: Field notes on the lesson:

A NOTE TO THE OBSERVER: Please keep in mind that this study has a keen interest in evidence of CCLS-aligned instruction. Do not limit yourself to only noting the emphases of the shifts; however, do keep these in mind as you are taking your notes. The shifts for ELA are:

1. Balancing Informational and Literary Text
2. Building Knowledge in the Disciplines
3. Staircase of Complexity
4. Text-Based Answers
5. Writing from Sources
6. Academic Vocabulary

As clearly and accurately as possible…
Take as much space as needed and provide as much detail as you can. Do not note your perceptions here, but rather what you actually see and hear. Make sure that you use consistent symbols for who is speaking (no names, but T-Teacher, T2: second teacher; S- student; X – a student called on). Also keep times at each major change of activity (t led; student-student interaction, etc.. Please indicate if the beginning and/or end of the lesson is missed.)

Part 2: Summary of practice
The summary a –j below may be done after the lesson if necessary.

a) *Describe the topic and apparent purpose of the lesson*

b) *Describe how the teacher makes connections (prior knowledge requested, KWL, text-to-text; personal experience; visuals)*

c) *Describe the types of activities/tasks (individual, small group, choral reading; student discussion of text; practice using academic vocabulary, conventions, foundational skills (e.g. print concepts, phonological awareness);higher-order; student presentation; discussion groups, group response; turn/pair/share*

d) *Describe how writing is integrated into this lesson (writing process, writers' workshop, reader/writer response, modeling/authentic displays, purpose of the writing activity, kinds of sources used, evaluation of writing)*

e) *Describe the materials/resources (e.g. fiction or nonfiction texts, textbooks, worksheets, overheads, smart boards, videos, any other technologies etc.) Describe range of and levels of complexity of materials*

f) *Describe supports offered (e.g. any ways instruction homework, or questioning was differentiated, modeling, other adults/resources/aids/assistants, centers)*

g) *Describe feedback and any ways student learning was assessed during this lesson(call on another student, probe, solicit others to assist, conference, multiple choice test or quiz, written response – short answer, essay, other assessment)*

h) *Describe the climate of the classroom (e.g. emotional support, teacher sensitivity, regard for student perspectives)*

i) *Describe how the teacher managed behavior*

Part 3: DEBRIEFING (After class)

1. What were your goals and objectives for this lesson? (if not stated explicitly during class)

2. How did you plan this lesson?
What kinds of materials were available to you?
Who decided on materials that you could use?
What information about your students did you use to inform this lesson?
Did you plan in alone or in collaboration?
What kind of support are you provided around lesson planning?

3. What CCLS were you attempting to teach in this lesson?
Describe any challenges you encountered teaching this lesson.
What do you attribute those challenges to?

4. How did this lesson fit into prior and future lessons?
Please describe your planning process

5. How did you assess students' learning during this class?

6. Is there anything else about this lesson that you would like to share?

END

Appendix B. Codebook

Code	Definition	Example
Equitable Use • Alternative materials	Instruction is designed to be useful and successful for diverse students	All of our Special Ed students in the consultant and resource room are expected to take that Regents Exam. They are taught by myself and a teaching assistant in a 15 to 1 setting. So we have a 15 to 1 Math 7, and we have a 15 to 1 Algebra Regents.
Flexibility in Use • Assessments • Materials	Instruction is designed to provide choice and method for use	We've viewed all the recommended texts by the common core, to compare what we have versus what they say we should have and then to us, if it's not high interest for kids, then we're not putting it in front of them. So do we use the modules…no. Do we use anything that we think helps…anything I've used in the module, I think is beneficial or that we're missing in our curriculum.
Simple and Intuitive Use • Directions • Guides	Instruction is designed to be straightforward	We make up a review sheet. You know we give a review sheet and we go over the review sheet, and we try to be there as much as we can
Perceptible Information • Different Modes of presentation	Information is communicated effectively despite ambient conditions	I'm sure you've noticed we have students from various backgrounds and different socio-economic status. And I think teachers at this district have really developed a fine craft in being able to develop

		instruction for all of the different types of learners.
Tolerance for Error • Feedback • Practice and extended opportunities	Instruction is designed in anticipation of variation in learning pace and prerequisite skills	So say a kid's struggling with this at night at home, they may come in early and go to that and get some extra help, or say kids just don't pull it off at home.
Low Physical Effort • Assistive technology • Time for learning	Instruction is designed to take into account nonessential physical effort	That system was put into 6 years ago. It's been a labour of love K-12. The field sound systems we've had on some of the students' IEPs. For some with auditory processing issues, we've had all students benefit from this.
Size and Space for Approach and Use	Instruction is designed to take into account students' physical needs	I've also found that it's allowed me to diversify my teaching a bit to different levels of kids. I can have a group working on one thing. When they get done, if they get done, go on to this, and meanwhile I can be working on part of the period who need some remediation.
Community of Learners • Student-student engagement • Student-teacher engagement	Communication between teachers and students is facilitated and promoted	What they really encourage us to do something new in the past several years is to pair our students. Students are not sitting in single rows anymore. They have partners. 4: partners and groups.
Instructional Climate	Instruction is designed to be inclusive and with high expectations for all students	I'd say one of the goals, that we're all doing, to have the kids become college and career ready and I think that in every single class the teachers and students are aiming for that goal.

Social Skill and Self-Advocacy Goals: An IEP Study

Gregory W. Smith, Ph.D.
The University of Southern Mississippi

K. Alisa Lowrey, Ph.D.
The University of Southern Mississippi

David Walker, Ed.D.
The University of Southern Mississippi

Author Note: Correspondence concerning this article should be addressed to Gregory W. Smith, Department Curriculum, Instruction, and Special Education, The University of Southern Mississippi, 118 College Drive #5057, Hattiesburg, MS 39406. Gregory.W.Smith@usm.edu

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Abstract

The purpose of this study was to determine if self-advocacy and social skills were targeted areas of instruction on a collected sample of Individualized Education Programs (IEPs). We also measured student attendance at IEP meetings as a potential step towards self-avocation. Utilizing secondary analysis with data collected from 170 IEPs, we examined IEPs for the inclusion of social skill and self-advocacy goals as well as student attendance at the IEP. Findings indicated that while social skills and self-advocacy goals were included, many of those goals were of poor quality in target and measurability. Student attendance at the IEP was documented at an extraordinarily high rate for this sample. Discussion of these items as well as their implication for future practice is included.

Social Skill and Self-Advocacy Goals: An IEP Study

General cultural attitudes concerning the obligations of a society to its individual citizens tend to affect social attitudes concerning the education and care of individuals with exceptionalities (Winzer, 1993). The passing of the Civil Rights Act of 1965 signaled a changing of social attitudes regarding the obligations of society toward its individual citizens (Kurla, 2015). The responsibility of the government to provide an equal education to *all* citizens was questioned and, in-turn, defined, during the Civil Rights Movement. The result of this discourse was Congress' enactment of the 1975 landmark educational law, the Education for all Handicapped Children Act (Public Law 94-142), most recently reauthorized in 2004 as the Individuals with Disabilities Education Improvement Act (IDEIA). The IDEIA contains seven major principals: (1) zero reject, (2) informed consent, (3) free and appropriate public school education (FAPE), (4) non-discriminatory evaluation, (5) individualized education program (IEP), (6) least restrictive environment (LRE), and (7) due process safeguards. Of the seven principals of IDEIA,

the IEP maintains its place as the cornerstone of special education legislation in the United States (Tucker, 1998).

The IEP

Created as plans or road maps to guide instruction and the delivery of services, students IEPs are the foundation for an appropriate education (Bryant, Bryant, & Smith, 2017). The IEP is developed and implemented by a multidisciplinary IEP team. The multidisciplinary IEP team must first determine whether the student is eligible for special education services and then, after eligibility is confirmed, develop the IEP which provides the foundation for establishing the educational program for each student's unique and specialized needs (Vaughn, Bos & Schumm, 2014). Each IEP must include the following components: (a) the student's present levels of academic performance, (b) measurable annual goals, (c) special education and related services to be provided, (d) program modifications or supports, (e) explanation of the extent to which the student will not participate in the general education classroom with his/her typically developing peers, (f) statement of any individual modifications in the administration of standardized tests, (g) projected implementation date of listed services and/or modifications, (h) anticipated frequency, location, and duration of the listed services and/or modifications, (i) how the student's progress toward his/her annual goals will be measured, and (j) how the student's parent/guardian will be notified of his/her progress or lack thereof (Polloway, Patton, Serna, & Biley, 2013). Each IEP must be reviewed and revised annually (typically at the end of the school year). However, a variety of other circumstances (e.g. a change in the child's anticipated needs, the results of any reevaluation conducted, or new information provided by the parent/guardian) under which the IEP team would need to review and revise the IEP during the school year exist (Pierangelo & Giuliani, 2012). During the review and revision process, the IEP team members should (to the greatest extent possible) allow the student to assume a leadership and self-advocacy role by becoming actively involved in all decisions (Torgerson, Minor, & Hong, 2004).

Self-Advocacy

Self-advocacy (a subskill of self-determination) is defined as having four primary components: knowledge of self, knowledge of rights, communication, and leadership (Test, Fowler, Wood, Brewer, & Eddy, 2005a). The acquisition of self-advocacy skills is a major step forward in a student's ability to, (a) advocate for rights, (b) communicate needs for support, and, (c) successfully request accommodations and modifications (Pocock et al., 2002; Test et al., 2005a; Walker & Test, 2011). While the acquisition of self-advocacy skills is imperative for the success of all students, evidence suggests students with disabilities are seldom explicitly taught self-advocacy skills, even though validated methods to teach such skills are readily available (Lancaster, Schumaker, & Deshler, 2002; Test, Fowler, Brewer, & Wood, 2005b). Regardless of the cognitive ability level, students with disabilities are capable of learning and using self-advocacy skills (Dybwad & Bersani, 1996; Malian & Nevin, 2002; van-Belle, Marks, Martin, & Chun, 2006; Williams & Shoultz. 1984). Self-advocacy skills enable students with disabilities to (a) communicate their needs, (b) identify the supports to which they are entitled to, (c) select personal goals, (d) plan steps toward the personal goals, (e) assess one's progress, (f) make choices, and (g) self-monitor and self-evaluate one's behaviors (Kleinert, Harrison, Fisher, & Kleinert, 2010; Ndlovu & Walton, 2016; Swart & Greyling, 2011; Wehmeyer, Palmer, Agran, Mithaug, & Martin, 2000; Wehmeyer & Sands, 1998). Self-advocacy skills can be used to increase a student's meaningful participation in the IEP process (Cease-Cook, Test, Scroggins,

2013; Hammer, 2004; Test and Neal, 2004). Self-advocacy skills are also beneficial to transition planning (Lee, Wehmeyer, Palmer, Williams-Diehm, Davies, & Stock, 2012; McBurney, Eaton & Torunski, 2017). By involving students in their own IEP and transition plan meetings, students with disabilities can develop the critical self-advocacy skills that are necessary for success in the post-secondary world (Test et al., 2005b).

One of the core components of self-advocacy is the communication of one's knowledge of self and rights (Test et al., 2005a, p. 45). To communicate about one's self and to convey knowledge of one's rights in ways that advance better outcomes for one's future success, students must learn social skills. Targets should include social skills that support appropriate communication with others, collaboration, problem-solving, and decision-making. Specifically, communication through self-advocacy includes the subcomponents of assertiveness, negotiation, articulation, body language, use of assistive technology, persuasion, and compromise (Test et al., 2005a). Social skills instruction may be used as a pre- or co-existing area of focus for students that should enhance their ability to self-advocate.

Social Skills

Social interaction skills are critical for successful cognitive, emotional, and social development (Bellini, 2008). Social skills serve as the basis for social interaction and broadly affect all aspects of human functioning; they span nonverbal and verbal topographical domains and a multitude of environment-behavior relationships (Mayville, 2013). For many students with disabilities, deficits in adaptive behavior or in social interaction are an inherit part of their disability as defined in the eligibility criteria of IDEA (2004) (i.e., intellectual disabilities, emotional behavior disorders, autism, etc.). Effective social skill instruction should aim to generate an intrinsic interest in appropriate social interactions on the part of the individual lacking such skills (Weiss, 2013). The goal of proper social skill instruction should be to establish "social competence," a combination of adaptive behaviors and social skills (Gerenser, 2013). As the U.S. educational system continues to place an emphasis on the academic development of all students, it is important to remain cognizant of the impact of social competence on the overall development of students with and without disabilities (Rabiner, Godwin, & Dodge, 2016). This hyper focus on academic achievement and increased access to the general educational curriculum may have, as an unintended consequence, reduced the focus on self-advocacy and social interaction as a substantial area of concentration on students' IEPs. As an example, La Salle, Roach & McGrath (2013) studied 130 IEPs and found that less than 20% of IEP goals were focused on areas other than academics. IEP goals should reflect the importance self-advocacy and social interaction for students with disabilities and should be an essential component of the overall student developmental program.

However, it is not enough to simply *include* social skill goals on an IEP. Social skill goals should be selected based on its ability to positively impact a student's social competence if achieved. The focus on such goals would, thereby, positively impact the skill set necessary for the communication component of self-advocacy. While social skill instruction can be utilized to teach many of the sub-components involved in self-advocacy communication, identifying an appropriate level of assertiveness remains imperative (Espelage, Rose, & Polanin, 2015; Walton & Ingersoll, 2013). Listening, persuasion, negotiation, and compromise have all been improved through social skills instruction focused on problem solving (Filippello, Marino, & Sorrenti, L.,

2013; Wade, Stancin, Kirkwood, & Brown, 2014). Even though many of these skills are fundamental to social competence (Carter, Common, Sreckovic, Huber, Bottema-Beutel, Gustafson, & Hume, 2014; Milligan, Philips, Morgan, 2016), they are not academic content subjects (or part of the typical academic curriculum) and remain among the most elusive targets to teach. Therefore, the purpose of this study was to: (a) determine if self-advocacy and social skills were targeted areas of instruction on student's IEPs and, (b) if students were taking steps toward self-advocacy by attending their IEP meeting.

Methods

Originally, this study was used to teach graduate students how to answer a research question stemming from a literature review using basic research methodology. Nine graduate students with education or related service backgrounds were enrolled in an advanced research methods class. As a part of this class, students were required to design and implement a research study collectively with faculty supervision. The third author facilitated the shaping of a question, Institutional Review Board (IRB) procedures, construction of consent forms, description of protocols, data templates, and reliability training among students. However, the course ended immediately following data collection. The first and second authors were provided the existing anonymous data set for complete analysis. Participants, procedures and analysis are described below.

Settings & Participants

A total number of 170 electronic IEPs were accessed for data collection purposes from the schools in which the nine participants worked. Consent was provided by those schools/districts. No identifying information was collected. Each IEP was given a number. Using a template data collection sheet, graduate students collected the following: age, disability category, whether or not the student had self-advocacy goals, whether or not the student had social goals, a copy of the self-advocacy or social goal if present, whether or not the student had ever attended an IEP meeting, and if so, age at first attendance. This information was collected from 170 IEPs reflecting student ages ranging from 5-20. See Table 1 for participant information.

Table 1
Participant Demographics

DESCRIPTOR	TOTAL	PERCENTAGE
PARTICIPANTS	170	100
DISABILITY CATEGORY:		
Autism Spectrum Disorder	23	13.52
Developmental Disorder	6	.03
Emotional Behavioral Disorder	27	15.88
Hearing Impairment	2	.01
Intellectual Disorder	21	12.35
Multiple Disabilities	2	.01
Other Health Impairment	22	12.94
Specific Learning Disability	57	33.52
Speech Language Impairment	9	.05
Traumatic Brain Injury	1	.00
Comorbidity *(twice exceptional)*	42	24.70
AGE RANGE:		
Childhood (birth – 10 years)	76	44.70
Early Adolescence (10 – 13 years)	26	15.29
Adolescence (14 – 17 years)	55	32.35
Adulthood (18+ years)	13	.07
AGE DURING FIRST IEP MEETINGE:		
Childhood (birth – 10 years)	6	.03
Early Adolescence (10 – 13 years)	30	.17
Adolescence (14 – 17 years)	51	30.00
Adulthood (18+ years)	0	.00
Never Attended	83	48.82

Data Collection

The procedures for the collection of the data were overseen by the third author. Components of basic research (ethics, fidelity, reliability) were covered through course content and reviewed throughout the data collection process. This study was a project based learning tool for the nine graduate students collecting the data. The procedures were as follows. First, the course focused on the literature surrounding social skills and self-advocacy content. The scope of this literature included the definition, importance, and issues that arise with students when those skills are not a focus of instruction. Graduate students wrote literature reviews about those topics. Second, an overview of the study was provided. The research question was presented and the importance of answering that question was discussed. Next, consents were obtained to access electronic IEPs in the districts in which the nine graduate students worked. A template for data collection was provided by the course instructor along with detailed instruction on completing the template utilizing sample IEPS. Data collection procedures were as follows:

a. Access IEPs for which you have consent. Follow all district procedures for accessing IEP (sign log, etc.)
b. Give the IEP a #.
c. Complete blocks on template including age, attendance, disability category, and presence of social/self-advocacy goals
d. Copy goals identified by the graduate student as self-advocacy or social skills. Copy goals exactly as worded on the IEP.
e. Close IEP following all district procedures.
f. Submit data sheet to course instructor.

Utilizing sample IEPs along with this template, interrater reliability was calculated by the course instructor during this time to ensure students were completing the template accurately according to collection procedures. Ninety percent reliability was obtained. The third author created a locked excel file of all collected data and shared with authors one and two.

Data Analysis

Authors one and two aggregated all data by category. Data were visually inspected by category, examining initial overall representation of age range, disability category, percent of participants with social/self-advocacy goals, and percent of participants who attended their IEP. Utilizing Bellini's (2008) three critical areas enhanced by social skills instruction identified earlier (cognitive, emotional and social development) and Test et al.'s (2005a) four components of self advocacy (knowledge of self, knowledge of rights, communication, and leadership), the first and second author conducted a secondary analysis on goals collected to determine their fit within those parameters. Any goal that did not fit was moved to a non-exemplar category. Authors recalculated aggregate scores based on the results of their analysis. Reliability was determined using a constant-comparison method as described by Strauss and Corbin (1998) until 100% agreement was reached.

Results

The goal of this study was to determine if self-advocacy and social skills were targeted areas of instruction on student's IEPs and if students were taking steps toward self-advocacy by attending their IEP meeting. Of the 170 total IEPs that were examined during this study, 43 (25.2%)

contained self-advocacy goals. The identified self-advocacy goals focused on students requesting their own accommodations and modifications, and/or asking for clarification and help. Additionally, of the 170 total IEPs that were evaluated, 76 (44.7%) contained social skills goals. The listed social skills identified cognitive development, emotional development, and social development. See Table 2 for examples of social and self-advocacy goals.

Further, for this study, student participation at IEP meetings was measured by the student signature on the IEP. Eighty-six of the 170 IEPs (50%) had students with disabilities signed as an *IEP Committee Participa*nt. Forty-eight of the 170 participants were ages 16 and above. Of those 48, 97.9% (47) signed as *IEP Committee Participants*. No other data is available on the degree to which those 86 students may have attended and/or participated. Lastly, in the complete data set collected by the nine graduate student research participants, 124 goals were originally identified as social skills goals, and 58 were identified as self-advocacy goals. After a second review by the primary authors employing the established criteria for social skills and self-determination, 119 goals were identified as social skills goals, and 25 were identified as self-advocacy goals. Based on this secondary review, graduate students misidentified five social skills goals and 33 self-advocacy goals. Finally, of the 170 IEPs that were accessed for this study, 48 (28.2%) identified the coexistence of two distinct disabilities (usually termed comorbidity).

Table 2
Examples of Self-Advocacy and Social Skills Goals

GOALS	**EXAMPLES**
Self-Advocacy Goals	"Will communicate with teachers to seek help, clarify instructions or requirements of academic tasks, and make them aware of accommodations." "Will spontaneously seek assistance, ask for help, and seek additional information." "Will ask for assistance, and work through task completion in all academic areas." "Will communicate with teachers to seek help, clarify instructions or requirements of academic tasks, and make teachers aware of accommodations." "Will self-advocate for clarifications to complete assignments." "Will request the speaker to position herself to maximize student auditory and visual input." "Will demonstrate self-advocacy skills in order to demonstrate learning style and academic needs to the classroom teacher." "Will ask for assistance when instructions are unclear." "Will move closer to the visual in the classroom." "Will ask for larger print if needed in the general education class." "Will ask to have quiet time when overwhelmed in the classroom." "Will demonstrate self-advocacy skills in order to communicate learning style, academic and behavioral needs to the classroom teacher."

	"Will demonstrate the ability to independently verbally initiate a request for an accommodation (seat change, computer usage, "time out") to a staff member."
Social Skills Goals	"Will identify situations that may lead to conflict."
	"Will be able to describe and apply appropriate verbal skills in a classroom setting." "Will respond with clear articulation and tone of voice." "Will improve organizational skills." "Demonstrate basic problem-solving skills in order to come to a resolution without the assistance of an adult." "Will accept changes in routine." "Will improve study skills." "Use calming strategies during an upsetting or frustrating situation." "Demonstrate a respectful and compliant attitude and behavior in class by refraining from outbursts, using profanity, or calling names." "Respond to anger or frustration in a positive manner without being physically aggressive with staff or peers." "Identify and manage feelings." "Display appropriate replacement behaviors." "Will make positive statements about qualities and accomplishments of self and others."
	"Accept consequences of his actions without trying to shift blame to others." "Refrain from using obscene/profane language in the classroom." "Demonstrate ability to follow class room and directions." "Attending to task without withdrawing." "Maintain appropriate eye contact when speaking to another student or teacher." "The student will keep hands to self." "Ask questions of others regarding topics initiated by self or others." "Raise hand and wait to be called on before talking aloud in a group setting."

Discussion

As previously mentioned, there was a discrepancy in the total number of goals identified by the graduate students compared to the amount totaled by the primary researchers. The five social skill goal and 33 self-advocacy goal discrepancy reflects a possible misunderstanding of identification criteria regarding both sets of goals on the part of the graduate students. This discrepancy could be due to a lack of depth in the training of the criteria and/or coverage of content for social skills and self-advocacy goals measurement.

As IEP goals represent the personal destination translated into desirable skills and behaviors that enable students to meet their educational and functional needs, the writing of quality IEP goals that set high expectations are paramount to the academic and behavioral success of students with disabilities (Sanches-Ferreira, Lopes-dos-Santos, Alves, Santos, & Silveira-Maia, 2013). Thus, special educators need to be well-versed in the construction of measurable IEP goals that reflect current special education standards. Of the 182 total IEP goals (Social Skills and Self Advocacy) collected by graduate student participants, the primary researchers identified 43 (23.6%) as unmeasurable and/or unclear. Examples of these poorly written IEP goals are: (a) "Identify and manage feelings," (b) "Attend to task without withdrawing (i.e. lying head on desk or pouting," (c) Orally respond to questions, greetings, and interactions," (d) "Make adequate decisions," and (e) "Increase ability to function appropriately within the school environment by transitioning to and with general education peers and accept changes in routine/schedule."

Also of note was the number of students that were identified with comorbidity (the diagnosis and coexistence of two separate disabilities). Comorbidity has been identified as a cause of academic underachievement in children, and has an overall negative impact on the child's educational experiences (Bandla, Mandadi, & Bhogaraju (2017). However, the total occurrence of comorbidity and the nature of the relationship between conditions has been a matter of debate in the research for quite some time (DiPasquale, 2015; Goff, Henderson, & Amico, 1992; Kendall & Clarkin, 1992; Martini, Heath & Missiuna, 1999). Studies that focus on coexisting conditions vary widely in terms of sample selection, choice of diagnostic measures or informants, and types of prevalent disorders (Barkley, 1990; Coen & Riccio, 1994; Kim, Freeman, Paparella, & Forness, 2012). The high number of IEPs in this study that identified the existence of two distinct disabilities signifies a need for an extended discussion and future research in area of special education and comorbidity.

Transition planning is required by IDEA (2004) at age 16. Attendance and participation in IEP development and transition planning are considered best practice (Landmark, et al., 2013). Attendance at a meeting is a simple step towards participation and self-advocacy. In Mississippi, transition plans are embedded in student's IEPs and planning occurs simultaneously. In the current study, 48 of the 170 participants were ages 16 and above. Of those, 97.9% (47) signed as *IEP Committee Participants*. This is markedly higher than other findings. Agran & Hughes (2008) found that only 53% of high school students attended their IEP meetings. Using National Longitudinal Transition Study data, Wagner et al., (2012) found 82.9% of students aged 15-19 attended their IEP meetings. A recent study by Cavendish and Conner (2017) used mixed methods research to examine the participation of 16 high school age (10^{th}-12^{th} grade) students with Learning Disabilities in their IEP process. Six (37.5%) of the 16 participated in their IEP

meetings, with only two reporting they felt their opinions were considered in the IEP process. Most interestingly, they found that the district had an informal policy not allowing students to attend if parents were not present. While initially it seems positive that 97.9% of the current study's participants attended their meetings, it may seem questionable in light of other study results and national averages. It is possible that the student was asked to sign the IEP as a participant at a different time. A more accurate measure would be to define attendance as being present at the meeting and to then observe that presence as did Cavendish and Conner (2017).

Positive outcomes are linked to student attendance and participation in IEP meetings. Student involvement in IEP development positively impacts attainment of goals and graduation rates (Cavendish, 2013; Powers et al., 2001). Martin, Marshall, and Sale (2004) connected student attendance at IEP meetings with increased focus by school personnel on student strengths rather than a more singular focus on student challenges. Additionally, they found student attendance correlated with parents reporting better understanding of the IEP.

IDEA (2004), identified best practices (Landmark et al., 2013), and improvements in student outcomes (Cavendish, 2013; Powers, Turner, Westwood, Matuszewski, Wilson, & Phillips, 2001) emphasize the need for student attendance and participation. Even so, findings are quite variable and disparate. Although 97.9% of participants signed as IEP Committee Participants, we did not observe whether or not they were actually in the meeting and, if present, their duration and/or participation in the meeting. A better measure would be to track the students' length of attendance and type of participation in the IEP meeting.

Recommendations

Based on these current findings, several recommendations are offered for teacher preparation and continuing professional development. First, the quality of the IEP social and self-advocacy goals identified throughout this study was poor. Although writing quality IEP goals seems to be included in every special education teacher preparation program, continued emphasis on the core components of those goals is necessary; particularly as those goals apply to the less frequently addressed areas of social skills instruction and self-advocacy. The quality of a goal is important. The presence of a poorly written social skills goal on an IEP will not help a student be self-determined even if he/she achieves that goal. Additional studies should be conducted to verify if this is a state specific issue, or one that is pervasive across our educational system. Efforts to ensure emphasis on IEP goals with high technical quality that lead to meaningful outcomes should be continued.

Second, including students in their IEP meeting seems a simple step for teachers to take given the positive outcomes associated with student attendance and participation. Efforts should be made in preservice/inservice teacher education programs to emphasize the necessity of student attendance and participation in IEP meetings. The development of IEPs and transition plans are naturally occurring opportunities for students with disabilities to demonstrate self-advocacy and social interaction skills. Additionally, those are the venues in which a lack of skill and an identified future focus towards the need for improvement should be addressed. Meaningful participation in those meetings is paramount to accessing self-directed outcomes. Additional research is needed to ensure IEP committees, specifically the special education teachers who facilitate those, understand the difference between signing the IEP, attending the IEP, and

participating in the IEP. Additional study would be beneficial to demonstrate the longitudinal effects of attendance and participation in IEP meetings on future adult outcomes contrasted with results of non-attendance and non-participation.

Third, masters level teachers must become leaders in the areas of social skills and self-advocacy if we are to see students make gains in those areas. Embedding stronger curricular attention to those less often prioritized areas is essential in any special education teacher preparation program. Additional study is necessary to determine how much emphasis on those areas is currently provided in teacher preparation, how that translates into the number of goals in those areas once teachers are practicing, and specific steps we can identify to improve that preservice/inservice.

Limitations

This study was limited by several factors. As previously noted, attendance at the IEP meeting was coded by the student's signature appearing on the IEP. Signing an IEP is not attendance or participation. It is possible that the student was asked to sign at a different time or was only there for part of the meeting. No data were gathered on student input into the IEP goals. Social Skills and Self-Advocacy goals were selected according to pre-determined criteria and were not often in a section titled "Social Skills" or "Self-Advocacy". It is possible that goals were missed or interpreted to fit the criteria when they may not have. No data were collected on transition plans for participants of that age. It would've been useful to identify if social interaction and self-advocacy goals were included there. We have no gender or racial/ethnic data to provide any information on whether or not there was variance along those lines.

Conclusion

The purpose of this study was to determine if self-advocacy and social skills were targeted areas of instruction on student's IEPs and students were potentially self-advocating by attending their IEP meeting. Results of the study indicated a lack of quality in self-advocacy and social skills goals reported. Additionally, findings supported an unusually high rate of attendance as measured by signatures on the IEP. The findings of this study support the need for additional research into IEP practice focusing on attendance and participation, social skills, and self-advocacy. Continued emphasis in preservice/inservice teacher training on quality goal writing as well as the inclusion of students in IEP meetings is warranted. A stronger emphasis on meaningful social skills and self-advocacy preparation for special education teachers is recommended.

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About the Authors

Gregory W. Smith, Ph.D. is an Assistant Professor in the Department of Curriculum, Instruction, and Special Education. Dr. Smith earned his Ph.D. in Curriculum & Instruction – Special Education from Clemson University. Prior to pursuing his doctorate, Dr. Smith was a special education teacher in the public school system of New Jersey. Dr. Smith's research interests include high-incidence disabilities, cognition, memory, and lived experiences. Dr. Smith teaches courses that prepare pre-service teachers to utilize and implement evidence-based practices in the classroom.

Alisa Lowrey, Ph.D. is an Associate Professor at the University of Southern Mississippi. She is a special educator with more than 25 years experience working primarily with individuals with developmental disabilities while also preparing others to work in this field. Her research includes teacher education, training and evaluation; inclusive educational practices including postsecondary practices for students with developmental disabilities including autism; and designing quality, individualized curricula to include the application of Universal Design for Learning. Dr. Lowrey has been Principal Investigator of several grants and contracts including a DOE TPSID grant and the Louisiana Autism Spectrum and Related Disabilities statewide autism project. Dr. Lowrey currently serves as the co-Editor of FOCUS on Autism and Other Developmental Disabilities.

David Walker, Ed.D. retired as an Associate Professor in the Department of Curriculum, Instruction, and Special Education at the University of Southern Mississippi in 2017.

Perspectives on Current Practices and Barriers to Training for Paraeducators of Students with Autism in Inclusive Settings

Emily Eyrolles Sobeck, Ph. D
Franciscan University

Rachel Robertson, Ph.D., BCBA-D
University of Pittsburgh

Abstract

Both the No Child Left Behind (NCLB) legislation and the Least Restrictive Environment (LRE) clause within Individuals with Disabilities Education Act (IDEA) of 2004 have impacted the educational service delivery for students with disabilities and the paraeducators that provide support services. As more schools turn to inclusionary practices, the impetus for highly trained paraeducators becomes of even more importance. The purpose of this mixed-methodology survey study was to identify the current practices and barriers of training for paraeducators who work with students with autism in inclusive settings and to compare and contrast the perspectives of principals, special education teachers, and paraeducators regarding these practices and barriers. This survey included 96 participants across the three participant groups. Discussion centers on the inadequate amount of training paraeducators receive, confusion on who is responsible for providing paraeducator training, the use of ineffective training methods, and making paraeducators a priority within the school structure.

Keywords: paraeducator, teaching assistant, paraprofessional training, inclusion, autism

Perspectives on Current Practices and Barriers to Training for Paraeducators of Students with Autism in Inclusive Settings

Along with the rising diagnosis of autism (Bolton & Mayer, 2008), specifically those identified as having high functioning autism (Crosland & Dunlap, 2012), comes one of the most complicated obstacles facing the field of education: how to provide services to children with autism that are effective, developmentally appropriate, and least restrictive (Schwartz, Sandall, McBride & Boulware, 2004). Over the last decade the field of education has shifted to more inclusive educational practices for students with autism. Inclusion has been a suggested practice for children with autism due to the social benefits associated with learning alongside non-disabled peers (Causton-Theoharis & Malmgren, 2005). Due to the difficulty with communication and social interactions that many students with autism experience (Crosland & Dunlap, 2012), practitioners have turned to the general education classroom as an environment where students can improve socialization skills and develop peer relationships (Harrower, 1999). Although there is a dearth of outcome research on inclusion, the majority of the existing literature suggests that inclusion can have positive social effects on students with autism (Ferraioli & Harris, 2011).

In addition to the social benefits it provides, inclusion has become a focus of school practice due to the mandates set forth by legislation (Harrower & Dunlap, 2001). While the federal legislation for students with disabilities does not include the term "inclusion," the least restrictive environment (LRE) requirement from the Individuals with Disabilities Educational Act (IDEA) serves as the basis for interpretation and practice. IDEA, as amended in 2004, requires that school districts educate students with disabilities in the LRE and meet their specific needs within these environments with supports and services (IDEA, 2004). School leaders have turned to inclusive practices as means to address these mandates set forth by legislation (Harrower, 1999).

The continuing increase in the number of students with autism who are eligible for special education services (Bolton & Mayer, 2008) and the focus, both school practice and legislation, on providing services to students with disabilities in inclusive settings, has dramatically redefined the role of paraeducators who provide inclusive support services (Carter, O'Rourke, Sisco, & Pelsue, 2009). Most school districts allocate paraeducator support to provide services to students with autism in inclusive programs (Robinson, 2011), making the use of paraeducators a common practice (Hall, Grundon, Pope, & Romero, 2010). Not only are paraeducators utilized more, but also their role has dramatically evolved and expanded (Killoran et al., 2011). In the general education environment paraeducators are now providing 1-to-1 academic instruction (Carter, Cushing, Clark, & Kennedy, 2005; Hall et al., 2010), serving as primary interventionists, adapting academic materials, encouraging student communication (Minondo, Meyer, & Xin, 2001), delivering literacy instruction (Causton-Theoharis, Giangreco, Doyle, & Vadasky, 2007; Lane, Fletcher, Carter, DeLorenzo, & Dejud, 2007), providing support for related services, communicating with parents (Riggs & Mueller, 2001), and delivering social skills instruction (Causton-Theoharis & Malmgren, 2005; Quilty, 2007).

With the expanding role of paraeducators, the No Child Left Behind (NCLB) legislation mandates that paraeducators participate in some form of training (No Child Left Behind [NCLB], 2002). Unfortunately, a mounting body of literature shows that paraeducators lack the necessary training needed to support students with disabilities (McCulloach & Noonan, 2013). Paraeducator training is generally unavailable, deficient, or limited in content (Hall et al., 2010), yet they work with the most difficult student population (Cautson-Theoharis & Malmgren, 2005). Although the placement of paraeducators is intended to help students with disabilities succeed in inclusive settings (Giangreco, 2010), the deficient amount of training provided to paraeducators has been shown to negatively affect the progress of the students they support (Giangreco, Edelmanm Luiselli & MacFarland, 1997). Unfortunately, the support of an untrained paraeducator can actually hinder the intended objectives of inclusion (Cautson-Theoharis & Malmgren, 2005).

As more students continue to be diagnosed with autism (Bolton & Mayer, 2008; Crosland & Dunlap, 2012) and as more school districts look to inclusive practices (Giangreco, Suter, & Doyle, 2010; Minondo et al., 2001), the impetus for highly qualified and trained paraeducators becomes of even more importance. Further, due to a lacking body of empirical literature, it is unclear what guidance the research base provides on training paraeducators who support students with autism. While the current literature suggests that paraeducators would benefit from more training, it is less clear how such training should be delivered (Brock & Carter, 2013). Training

approaches for paraeducators have been experimentally tested in a limited number of studies, and most of these studies lacked replicable training processes (Brock & Carter, 2013), leaving paraeducator training one of the least investigated and potentially most significant areas of special education (Giangreco et al., 2001).

Currently 15 experimental studies (Bessette & Wills, 2007; Bingham, Spooner, & Browder, 2007; Brock & Carter, 2013; Causton-Theoharis, & Malmgren, 2005; Feldman & Matos, 2013; Maggin, Fallon, Sanetti & Ruberto, 2012; Malmgren, Causton-Theoharis, & Trezek, 2005; Martella, Marchland-Martella, & Macfarlane, 1993; McCulloch & Noonan, 2013; O'Keefe, Slocum, & Magnusson, 2013; Owens, Fredrick, & Shippen, 2004; Quilty, 2007; Robinson, 2011, Singer, Sowers, & Irvin, 1986; Toelken & Miltenberger, 2012) have examined the effects of training on paraeducators who support school-age students with disabilities in a public school setting in the United States. Almost all of the studies focused on adaptive and behavioral skills, while two targeted academic interventions (O'Keefe, Slocum, & Magnusson, 2013; Owens, Fredrick, & Shippen, 2004). Although all studies reported positive outcomes in response to providing training to paraeducators, all of the studies, except one (Robinson, 2011), concentrated on isolated skills or skills specific to a particular student (e.g., Picture Exchange System, social stories). Unlike the other studies, Robinson (2011) examined a training package that included several universal behavior management strategies that could be applied across students. Moreover, of the 15 studies, only six studies conducted some portion of the study in an inclusive setting (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2013; Malmgren, Causton-Theoharis, & Trezek, 2005; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012), and six studies (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2013; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012) included at least one participant with a diagnosis of autism. The training procedures used across the studies fell into categories by those that used didactic instruction (Causton-Theoharis & Malmgren, 2005; Koegel et al., 2014; Malmgren et al., 2005; Quilty, 2007; Toelken & Miltenberger, 2012), didactic instruction with performance feedback (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993), performance feedback with modeling (Robinson, 2011), online instruction (McCulloch & Noonan, 2013), or video modeling (Brock & Carter, 2013). Although the paraeducator training research base does not shed light on the most effective paraeducator training methods, there is a strong research base for effective teacher training practices. Within the teacher training literature base researchers have found that didactic instruction alone is not enough to maintain newly acquired skills (Hans & Weiss, 2005; Noell et al., 1997) and that training packages that include performance feedback have shown promising effects (Duchaine, Jolivette, & Fredrick, 2011; Hawkins & Heflin, 2011). Although performance feedback has been found to have strong positive effects with teachers, it appears to be infrequently used with paraeducators. Paraeducator training is most often conducted through single-event workshops (i.e., school in-service days; Brock & Carter, 2013), which have shown to be minimally effective on paraeducator behavior (Barnes, Dunning, & Rehfeldt, 2011).

Overall, authors from these 15 experimental studies found that providing relatively brief training programs improved both paraeducator and student performance. Further, across all six studies most paraeducators were able to maintain, and in some cases generalize, the newly acquired skills. Paraeducators also reported moderate to high satisfaction with the training they were provided, and most said they would recommend the training to other paraeducators. Those

paraeducators that were provided with some type of coaching reported that they greatly appreciated and benefited from the specific feedback.

In addition to the experimental studies, 15 survey studies investigated paraeducator training in the United States to varying degrees. Many of the studies approached the training needs of paraeducators relative to a specific area, such as gym class (Davis, Kotecki, Harvey, & Oliver, 2007; Lieberman & Conroy, 2013), transition services (Morehouse & Albright, 1991), and occupational education (Whitaker, 2000), while several others touched on the training needs of paraeducators within a broader survey (Carter, O'Rourke, & Sisco, 2009; Downing, Ryndak, & Clark, 2000; Hilton & Gerlach, 1997). Of the 16 survey studies only three focused specifically on the general training needs of paraeducators (e.g., adequacy of training, amount of supervision, continued training needs, responsibilities; Breton, 2010; Passaro, 1994), with just one survey (Riggs & Mueller, 2001) that investigated the training needs of paraeducators who work in inclusive settings. All three manuscripts addressed many aspects of the paraeducator profession with a brief section that focused specifically on training needs. These three studies consistently revealed a lack of paraeducator professional development, with most training being provided intermittently from coworkers. The findings from these studies also indicated that paraeducators need more training that specifically focuses on preventing and responding to student problem behavior. Although Riggs and Mueller (2001) focused on paraeducators who work in inclusive environments, there are currently no surveys in the literature that examine the training needs of paraeducators who work in inclusive settings and specifically support students with autism. Further, two of the three studies that examine the general training needs of paraeducators do so by considering the perspectives of solely the paraeducators. Only Passaro (1994) considered the perspectives of special education teachers and administrators and found that although most of the paraeducators felt somewhat prepared for the responsibilities associated with their position, school administrators and teachers felt that the paraeducators lacked the necessary competencies for their position. Passaro (1994) suggested that further research is needed that examines the specific needs and most effective training delivery approaches for paraeducators. With paraeducators most often working directly under the supervision of a special education teacher (Carnahan, Williamson, Clarke, & Sorensen, 2009; French, 2003) and with the leadership role principals hold, it may be beneficial to consider their perspectives on paraeducator training as well.

With both limited and dated survey literature relative to the training needs of paraeducators, this survey sought to add to the current research-base by identifying the most current paraeducator training practices being used, assessing the barriers to paraeducator training that schools face to the literature, focusing on inclusive settings, targeting paraeducators who specifically support students with autism, and obtaining multiple perspectives within the school structure. Therefore, the purpose of this exploratory study was to identify both the current practices and barriers to training for paraeducators who work with students with autism in inclusive settings and compare and contrast the perspectives of principals, special education teachers, and paraeducators relative to these training practices and barriers.

Method

Survey Distribution and Data Collection

This anonymous survey was conducted in public schools in both Pennsylvania and Tennessee. E-mail addresses were obtained through the Tennessee Department of Education and through the Pennsylvania Tri-State Area School Study Council. Pennsylvania professionals were of primary interest; however, in order to extend the sample size, Tennessee professionals were also included in the study. The targeted survey population was elementary school principals, special education teachers who work within an inclusive model, and paraeducators who support students with autism in an inclusive environment.

The survey was created and disseminated through the Qualtrics Survey Software. Survey links, along with an explanation of the study, were e-mailed to elementary school building principals. Building principals were then asked to both complete the survey and forward the e-mail containing the survey links (i.e., a link for principals, a link for special education teachers, and a link for paraeducators) to their special education teachers and those paraeducators who work in inclusive settings. Once the survey was distributed, participants had eight weeks to complete the survey, with a reminder e-mail sent at four weeks. The reminder e-mail contained a similar explanation of the study as well as the survey links.

Survey measure. The survey measure was created following several steps. First, the experimental and survey literature on paraeducator training was reviewed. Then, using the survey literature base as a guide (Passaro et al., 1994; Vasa, Steckelberg, & Ronning, 1982) preliminary survey questions were drafted. A school psychologist, elementary school paraeducator, elementary school principal, university special education research faculty member and two elementary special education teachers piloted the study and then assessed both the face and content validity of the survey (Litwin, 1995). Reviewers provided feedback based on the structure of the questions, the design of the survey, the addition or removal of specific questions, and the ease of understanding the questions. Minor revisions were made to the questions based on the received feedback and the school psychologist and university research faculty member reviewed the survey one final time.

Each survey was comprised of two components. The first component addressed individual and building demographics specific to the position of the respondent. The second component of the survey asked questions about current paraeducator training practices and the barriers faced in regard to such training. The style of response varied among the questions, consisting of multiple-choice, open-ended, and rating scales. Multiple choice questions required participants to either select one or two responses, while open-ended questions asked participants to respond with one answer or list three responses. Table 1 outlines the survey questions presented to each participant group.

Table 1
Survey questions per participant group.

Principals	Special Education Teachers	Paraeducators
Component A		
1. What is the race/ethnicity make up of the student population in your building? 2. What percentage of the student population receives free and reduced lunch? 3. Describe the area in which your building is located. 4. How many paraeducators are employed in your building that work in inclusive settings?	1. What is your race/ethnicity? 2. How many years have you been a special education teacher? 3. What is the highest education you have received? 4. If you have a degree(s), please specify. 5. Please describe any other certification you hold or training that you have received. 6. Describe the average breakdown of your teaching hours between self-contained/special education settings and inclusive settings per day. 7. How many of the students on your caseload have a diagnosis of ASD? What percentage of your caseload do these students make up? 8. Of those students on your caseload with ASD, how many are included in the regular education environment for the following durations during the day? 9. Of those students with ASD on your caseload included in the regular education classroom for any portion of their school day, how many have paraeducator support services provided to them while in the regular education	1. What is your race/ethnicity? 2. How many years have you been a paraeducator working with special education students? 3. What is the highest education you have received? 4. If you have a degree(s), specify what the degree(s) is/are in. 5. Please describe any other certifications you hold or specific training that you have received relative to your training.

	environment? What percentage of your students with ASD do they make up? 10. On average, how many students with ASD do the paraeducators under your direction support at one time in an inclusive setting?	
Component B		
1. How often are the paraeducators that work with students with ASD in inclusive settings in your building trained on special education content during the school year? 2. What type of content is most often focused on during training sessions? 3. How is this training primarily conducted? 4. Who normally provides paraeducator training? 5. Do you feel that the paraeducators that work with students with ASD in inclusive settings are provided with an adequate amount of training throughout a school year? 6. In what ways/why do you feel training is adequate or inadequate? 7. List three barriers that prevent your building from implementing more effective and tailored training opportunities to your paraeducators that work with students with ASD in inclusive settings.	1. Do you feel that the paraeducators that work with students with ASD in inclusive settings are provided with an adequate amount of training throughout a school year? 2. In what ways/why do you feel training is adequate? 3. List three barriers that you feel prevent your district from implementing more effective and tailored training opportunities to the paraeducators. 4. List three ways you think the paraeducator training in your building could be improved. 5. How many hours a week do you dedicate to assisting, training, and/or guiding paraeducators? 6. What content/topics do you think would be most beneficial for paraeducator training to focus on? 7. Is there anything else you think we should know about paraeducator training in your school?	1. How often are you trained on special education content during the school year? 2. What type of content is most often focused on during training sessions? 3. How is this training primarily conducted? 4. Who normally provides the training? 5. Do you feel that the paraeducators who work with students with Autism Spectrum Disorders (ASD) in inclusive settings are provided with an adequate amount of training throughout a school year? 6. In what ways/why do you feel training is adequate or inadequate? 7. List three barriers that you feel prevent your building from implementing more effective and tailored training opportunities to you. 8. List three ways you think the paraeducator training in your building could be improved. 9. How often are you observed and provided with individual and formal (i.e., written documentation, discussion with notes, conferencing) performance feedback (i.e., feedback on your performance with

8. List three ways you think the paraeducator training in your building could be improved.
9. Is there anything else you think we should know about paraeducator training in your school?

students and specific strategies) by a trained professional during a school year?
10. How comfortable are you with the role and responsibilities you hold as a paraeducator in relation to the amount of training you have received?
11. Is there anything else you think we should know about paraeducator training in your school?
12. How would you rate your overall job satisfaction as a paraeducator who supports students with ASD in inclusive settings?

Data analysis. Multiple-choice questions were analyzed qualitatively and quantitatively. Open-ended questions were analyzed by (1) identifying and categorizing common themes that emerged from the participants' responses, and (2) calculating the total number of common responses within each participant group. Once the descriptive data was coded and grouped by theme, quantitative comparisons could be made across the participant groups. Both multiple-choice and open-ended questions were further analyzed using the non-parametric Mann Whitney U test of mean ranks to identify possible differences in responses across the three participant groups. All Mann Whitney U tests were conducted at the $p < .05$ significance level.

Results

Participants

A stratified sampling method was employed by sending 551 e-mails to all of the elementary school principals. Of the 551 e-mails sent, 96 individuals completed the survey across the three participant groups. Of the 96 individuals who completed the survey, 61 participants identified themselves as a principal, resulting in a response rate of 11% for principals. Additionally, 13 elementary special education teachers and 22 paraeducators who work with elementary students with autism in inclusive settings completed the survey. Although the current figures calculate a 17% response rate, the true response rate is unable to be determined. Due to the distribution of the survey being dependent on principals (e.g., principals forwarding the e-mail to teachers and paraeducators), it is unknown how many special education teachers and paraeducators were presented with an opportunity (i.e., received an e-mail) to participate in the survey.

School population. Building principals were asked to provide demographic information regarding the composition of their student population. Across the 61 elementary schools most principals reported that their schools primarily served Caucasian students. Further slightly more than half of the schools were located in a rural setting, with the other half of schools located in either a suburban or urban environment. On average, across all of the schools, building principals reported that 52%, with a range from 9%-100%, of their school population received free and reduced lunch. Table 2 provides the demographics of each school.

Special education teachers. All of the special education teachers identified themselves as Caucasian. More than half of the special education teachers reported earning a Master's Degree, with 38% of special education teachers reporting an earned Bachelor's Degree. Years of experience varied across all special education teachers ranging from less than one year to more than 15 years, with all special education teachers reporting that they held at least one additional related certification. Table 2 provides the demographics of the special education participants.

Paraeducators. Most of the paraeducators included in the study identified themselves as Caucasian. Reported years of experience ranged from one year to more than 16 years and just under half of the paraeducators reported high school as their highest level of education. Four paraeducators reported having earned a degree beyond high school, all in a field unrelated to education. Table 2 provides the demographics of the paraeducator participants.

Table 2
Participant Demographics
*Note: The number of participants within each group differ depending on how many individuals from that subgroup responded to the survey.

School Population (n=61)							
	Caucas.	Af. Am.	Hispan.	Asian	Multi.	Nat. Am.	Other
Race/Ethnicity	94%	3%	1.3%	1.16%	.81%	.06%	11%
	Rural	Suburban	Urban				
Location	53%	36%	11%				
Sp. Ed. Teachers (n=13)							
	Caucas.	Af. Am.	Hispan.	Asian	Multi.	Nat. Am.	Other
Race/Ethnicity	100%	0%	0%	0%	0%	0%	0%
	B.S. Ed.	M.S. Ed					
Education	38%	62%					
	Early Ch.	El. Ed.	ESL.	SLP.	Admin.	Psy.	
Certifications	23%	54%	8%	8%	15%	15%	
	<1	1-5	6-10	10-15	15+		
Years of Experience	15.38%	23.08%	7.69%	7.69%	46.15%		
Paraeducators (n=22)							
	Caucas.	Af. Am.	Hispan.	Asian	Multi.	Nat. Am.	Other
Race/Ethnicity	95.45%	0%	4.55%	0%	0%	0%	0%
	<1	1-5	6-10	10-15	15+		
Years of Experience	0%	19.05%	23.81%	33.33%	23.81%		
	HS Dip.	College	Assoc.	Bach.	Grad.	Other	
Education	47.62%	14.29%	9.52%	4.76%	4.76%	19.05%	

Paraeducator Training
Each participant group answered questions relative to the adequacy and frequency of training, the provider of training, the approaches used to conduct the trainings, and the content most often focused on during training sessions. Table 3 details the participants' responses per each question.

Adequacy. When asked whether or not paraeducator training was adequate about half of each participant group reported that the current training opportunities given to paraeducators were not adequate.

Frequency. Although significantly more paraeducators than principals reported that they are trained between 21-30 hours per school year, a significant number of principals conversely reported that paraeducators are only trained an average of 0-10 hours per school year.

Trainers/Instructors. When asked who most often provides paraeducator training, almost half of the paraeducators reported that an outside agency representative most often provides professional development, while principals mostly reported the director of special education implements such trainings. Further, some principals reported that the special education teacher is the main paraeducator trainer, while only one paraeducator identified special education teachers as someone who provides training. Moreover, almost half of the special education teachers reported that they spend less than one hour a week providing training and assistance to paraeducators.

Training approaches. Half of the paraeducator participants and just over half of the principals stated that paraeducator training is primarily conducted through a presentation format. In regard to performance feedback (i.e., a brief meeting between a consultant and a consultee following the consultant observing the consultee in the natural environment; Fallon et al., 2014), only 5% of paraeducators and 13% of principals reported this as a current training practice. Almost half of the paraeducators reported that they are never provided with any type of formal or written performance feedback.

Content of training. A little under half of both paraeducators and principals indicated that the focus of professional development is often on behavioral management and practices. However, when asked which topic area would be most beneficial for paraeducators to receive training, 83% of special education teachers reported that behavior management and practices as the area that needed the most additional professional development.

Table 3
Paraeducator training results.

Adequacy						
	Yes	No				
Principals	45%	55%				
Sp. Ed. Teach	38.48%	61.54%				
Paraeducators	57.14%	42.86%				
Frequency (hours)						
	0-10	11-20	21-30	31-40	40+	
Principals	57.14%*	23.81%	11.90%*	4.76%	2.38%	
Paraeducators	19.05%*	28.57%	47.62%*	0%	4.76%	
	<1	1-2	3-4	5-6	6+	
Sp Ed. Teach: Time spent training	41.67%	41.67%	8.33%	0%	8.33%	
Trainers (select 2)						
	Sp. Ed. Dir.	Sp. Ed. Tch.	Agency	Admins.	Other	
Principals (n=65)	38.46%	16.92%	27.69%	16.92%	0%	
Paraeducators (n=20)	25%	5%	45%	15%	10%	
Approach (select 2)						
	Present.	Online	Modeling	Model + PF	Readings	Other
Principals (n=60)	78.57%	21.43%	16.67%	19.05%	7.14%	0%
Paraeducators (n=36)	90%	40%	25%	10%	10%	5%
Content (select 2)						
	Policies	Academic	Behavior	General	Other	
Principals (n=79)	42.86%	45.24%	59.52%	40.48%	0%	
Paraeducators (n=42)	60%	15%	90%	35%	10%	
Sp. Ed. Teach: Content needed to be focused on	0%	8.33%	83.33%	8.33%	0%	

**denotes significant difference between participant groups, p. <05 according to Mann Whitney U, test of mean ranks.*

**Note: The number of responses within each group differ depending on how many individuals from that subgroup responded to each specific question.

Barriers to Training

When given an open-ended question to identify barriers to implementing more effective training for paraeducators 12 common categories across all three participant groups emerged. These 12 categories are displayed in Table 4. Across the three participant groups the most frequently reported barriers included time and money. Further, there was a significant difference between the number of paraeducators and principals that identified a lack of paraeducators on staff as a barrier. Additionally, significantly more special education teachers than paraeducators reported that the lack of quality trainers posed a barrier to providing paraeducator training. Lastly, significantly more paraeducators than principals identified a lack of respect towards paraeducators as a barrier. Specifically paraeducators identified "poor listening skills on the part of administration," "not being invited to participate in IEP meetings," lack of time allocated to "communicate about our students," "not enough substitutes for paraeducators," and "lack of respect from administration" as barriers surrounding paraeducator training.

Table 4

Reported barriers to paraeducator training.

Barrier	Paraeducators (n=30)	Sp. Ed. Teach. (n=19)	Principals (n=95)
Time	30%	42.11%	30.52%
Money	20%	15.79%	28.42%
Lack of Trainers/Quality Training	3.33%*	31.58%*	16.84%
Lack of Respect/Priority/Communication	16.66%*	5.26%	3.15%*
Varying Disabilities/Student Needs	3.33%	5.26%	6.31%
Paraeducators Understaffed	10%*	0%	1.05%*
Contracts/Policies/Mandates	0%	0%	5.26%
Turnover Rate	0%	0%	1.05%
Varying Levels of Experience	3.33%	0%	0%
Schedule Conflicts	3.33%	0%	3.15%
Location/Space	6.66%	0%	0%
Lack of Substitutes for Paras	3.33%	0%	1.05%

**denotes significant difference between participant groups, p. <05 according to Mann Whitney U, test of mean ranks.*

**Note: The number of responses within each group differ depending on how many individuals from that subgroup responded to each specific question. Participants were encouraged to select up to three responses.

Improving Paraeducator Training

When given an open-ended question to share ways to improve paraeducator training, responses yielded 10 reoccurring themes. Table 5 shows these 10 themes across the three participant groups. Paraeducators suggested that providing options for training, such as team/group trainings, and structuring training sessions in a more focused and detailed manner would be most helpful. Additionally, several paraeducators reported that establishing an increased level of respect for paraeducators and improving communication among administrators and paraeducators would improve paraeducator training overall. Specifically, paraeducators identified "ask paraeducators what they feel would help us do our jobs better," "take us seriously and give us respect," "communication among coworkers," and "training in the areas

you work, for example do not give copier training when you do not copy," as suggested improvements.

Special education teachers felt that increasing the frequency of trainings would be most helpful, while several also felt that more team/group trainings would improve paraeducator training. Further, special education teachers identified more focused trainings, improved paraeducator respect, additional training options, more outside agency speakers, contractual changes, and increased pay for paraeducators as possible means to improve paraeducator training.

Building principals indicated that increasing the frequency of training, obtaining more funding, and allocating time for trainings would improve paraeducator training the most. Further, several principals reported that giving paraeducators more options for training and providing more focused sessions would be beneficial. Significantly more principals than paraeducators identified increased funding as a way to better the training given to paraeducators. Lastly, significantly fewer principals than paraeducators identified increasing the level of respect given to paraeducators as a way to improve paraeducator training.

Table 5
Reported ways to improve paraeducator training.

Improvement	Paraeducators (n=31)	Sp. Ed. Teach. (n=17)	Principals (n=67)
Increase Frequency of Trainings	12.90%	41.18%	17.91%
More Team Meetings/Trainings	12.90%	11.76%	8.96%
More Detailed & Focused Trainings	22.58%	5.88%	10.45%
Respect/Priority/Communication	22.58%*	5.88%	1.50%*
More Options for Training	16.12%	5.88%	11.95%
More Agency & Guest Speakers	3.22%	5.88%	5.98%
Contractual Changes	0%	5.88%	8.96%
More Funding/Grant Money	0%*	0%	14.93%*
Designated Time for Training	9.68%	0%	11.95%
Increase Pay for Paras	0%	5.88%	1.50%

**denotes significant difference between participant groups, p. <05 according to Mann Whitney U, test of mean ranks.*
**Note: The number of responses within each group differ depending on how many individuals from that subgroup responded to each specific question. Participants were encouraged to select up to three responses.

Job Satisfaction
Responses varied when paraeducators were asked about their comfort with the responsibilities they hold as a paraeducator in relation to the amount of training they have received. Paraeducator responses evenly ranged from somewhat comfortable to very comfortable in regard to how comfortable they are in their current position. Further, relative to job satisfaction, half of the paraeducators reported that they love their job, but it is very difficult, while the other half of paraeducators reported that they either love every aspect of their job or they have neutral feelings towards their position.

Discussion

The purpose of this study was to identify the barriers and current practices of paraeducator training for those paraeducators who support students with autism in inclusive elementary classrooms. In addition this survey sought to compare and contrast the perspectives on paraeducator training of building principals, special education teachers and paraeducators. The responses across all three participant groups suggest that schools face several common barriers when planning and implementing paraeducator training. The responses also suggest that the current training practices being used may produce greater effects if several specific areas are targeted for improvement.

On average, just over half of the participants reported that paraeducator training for those paraeducators who support students with autism in inclusive settings is inadequate. Although only just under half of paraeducators reported that their training was inadequate, 62% of special education teachers, those individuals who are considered the experts of their field and often directly supervise paraeducators, reported that paraeducator training was insufficient. All three participant groups recognized the need for increasing the frequency of training. Specifically, 81% of principals reported that paraeducators receive less than 20 hours of training per school year. Because the Pennsylvania School Code requires school districts to provide a minimum of 20 hours of training per school year for paraeducators (Pennsylvania School Code, 2008**)**, the reported lack of this minimum amount of training may be a cause for concern.

This study also identified some concerns about the paraeducator training approaches employed by schools. Although a review of the literature revealed that there is minimal research on effective paraeducator training methods, the teacher training literature suggests that training packages that include performance feedback outperform those training approaches that rely on didactic instruction alone (Duchaine, Jolivette, & Fredrick, 2011; Hawkins & Heflin, 2011). Despite performance feedback being an evidence-based practice (Cornelius & Nagro, 2014) the results of this study suggests that it tends to be used infrequently with paraeducators. Over half of the paraeducators and principals reported presentation as the primary method of paraeducator training and only 6% of paraeducators and 13% of principals identified performance feedback as a commonly used training method. Further, almost half of the paraeducators reported that they had never received any form of individualized performance feedback. Reliance on didactic instruction as the primary paraeducator training approach may limit the effect on paraeducator performance. For example, 43% of paraeducators and 32% of principals reported that paraeducator training most often focuses on behavioral support for students with autism, yet 83% of special education teachers reported the need for paraeducator training to concentrate on behavioral support. If the focus of most paraeducator training sessions is on behavior, yet the actions of the paraeducators in the classroom indicate the need for behavioral support training, the current didactic training approaches may not be effectively preparing paraeducators.

There may also be some confusion in regard to who is responsible for providing training. Just under half of the paraeducators reported that an outside agency representative most often provides their training, whereas 38% of principals reported that it is the director of special education's role to provide such training. Further, several principals reported that the special education teachers were the main providers of paraeducator training, yet most of special

education teachers reported that they spend less than two hours per week assisting paraeducators. With inconsistencies being reported across the three participant groups it appears there may be some misperceptions on who should be providing training to paraeducators. Further, with a large number of paraeducators providing special education services to students with autism in inclusive settings, paraeducators are spending less time under the direct supervision of a special education teacher, resulting in less time for informal training provided by the special education teacher. With this shift in the delivery of support services for students with autism, clarifying who is responsible for providing paraeducator training may help to ensure that paraeducators are provided with an adequate amount of training per school year. This clarification would further help to alleviate the assumption that someone else is providing the training.

An additional concern raised by this study is the varying perceptions of respect and priority given to paraeducators. Although all participant groups recognized the need for increased training opportunities for paraeducators, time is often not allocated for such trainings. Additionally, several paraeducators reported that it is common for training sessions to be repetitive in nature, while several special education teachers and principals indicated that the training sessions offered are often of low quality. Both the minimum amount of time dedicated for training and the poor quality of trainings suggest that paraeducator training may not be a high priority within the school structure. Further, 23% of paraeducators also reported the need for more focused areas of training relative to their roles and responsibilities. Specifically, one paraeducator's response to ways to improve paraeducator training was to provide "training in the areas [paraeducators] work, for example, [do not provide] copier training when you don't copy." This statement indicates that some schools may be missing the importance of paraeducators and the intended objective of paraeducator training. Further, significantly more paraeducators than principals reported the need for more paraeducator respect and communication, suggesting that there may be a notion of under-prioritization felt by paraeducators which building level administrators might be unaware of. By not allocating an adequate amount of time for training, engaging in minimal communication with paraeducators, and delivering poor quality trainings, school administrators may unknowingly be sending an unintended and unappreciative message to paraeducators. Since paraeducators work with some of the most challenging students (Cautson-Theoharis & Malmgren, 2005), it is important to ensure they are given high quality and effective training, but it is also of equal importance to make sure their role and contribution to the school structure is valued.

Limitations

There were several limitations of this study. First, the data collected is based on the report of principals, special education teachers, and paraeducators who elected to participate in the survey, therefore limiting the diversity of the sample population. Additionally, an e-mail was sent to elementary school building principals requesting their participation in the survey and that they forward the survey onto the special education teachers and paraeducators who work in inclusive classrooms in their building. It is unknown how many principals forwarded the survey, making the response rate for special education teachers and paraeducators unable to be determined. This also may have impacted the total number of responses across all participant groups. Because the survey was anonymous the responses made by all three participant groups could not be linked, leaving it unclear which participants were employed by the same school. Lastly, since

paraeducator training practices are left to the discretion of the state, responses from Pennsylvania and Tennessee participants may have varied due to state-level mandates.

Implications for Practice

The findings of this survey affirm the need to continue to improve the training provided to paraeducators who support students with autism in inclusive settings. Several recommendations can be made based on the results of this study. First, moving beyond didactic instruction and incorporating some form of performance feedback may be a more effective approach to train paraeducators. In addition to being an evidence-based practice, performance feedback may also help encourage dialogue between paraeducators and school administrators, giving paraeducators more of a voice within the school structure. Second, clarifying who is responsible for paraeducator training throughout the school year may help to ensure that trainings are scheduled and executed. By eliminating the assumption that paraeducator training is being provided by someone else it is more likely that trainings will actually be carried out. Third, matching training sessions to the roles and responsibilities of the paraeducators may be more beneficial than universal school-wide professional development sessions, usually designed for teachers. Using the needs of the paraeducators, specifically those who support students with autism in inclusive settings, to inform training would both improve the communication between paraeducators and administrators and help to alleviate training sessions from being redundant. Lastly, recognizing the important role paraeducators play in the delivery of special education services and allocating time to foster the skills needed to support students with autism in inclusive classrooms may ultimately help to make inclusion successful for both the students and faculty.

Implications for Research

With the use of paraeducators being a common intervention for students with disabilities in inclusive settings (Hall, Grundon, Pope, & Romero, 2010) continued examination of training approaches for paraeducators who support students with autism in inclusive settings is needed. Building off of the recommended training practices discussed within the teacher training research base, paraeducator training research that investigated performance feedback as a training approach is needed. Further, studying training approaches that give paraeducators time to engage in professional dialogue with both their colleagues and supervisors may show positive effects on paraeducator performance. Lastly, the results of this survey suggest that many paraeducators feel underappreciated and not valued as a team member. Studies examining the level of respect given to paraeducators, the effect it has on both their performance and that of their students, and training approaches that enable paraeducators to have a voice may shed some light on the importance of making paraeducators a priority. Further, examining more effective ways to promote paraeducators as collaborative team members may serve to better prepare paraeducators for their ever-evolving role.

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Poverty and Learning: The Effects of Poverty in the Classroom

Dr. Jessie S. Thacker-King
Arkansas State University

Abstract

"*Education is the most powerful weapon which you can use to change the world"*
Nelson Mandela (Strauss, 2013)

Nelson Mandela's statement provides the basis for this article. Education provides a means of escaping the consequences of poverty. Children who live at or below the poverty level must overcome the detrimental effects of poverty before education can begin. The causes of poverty in America is as varied as the number of students affected. The one theme that evolved from the research is the number of children affected by poverty continues to grow (Flores, 2014; Ehrenfreund, 2016;Staff, 2017). With more than 19% of public school children affected by poverty in the United States, researchers are delving into the reprecussions related to the long term effects of children living below the poverty level. This article reviews the prevelance of poverty and growth of "extreme" poverty. Through research, the author presents the expanse of poverty in the United States. The author also examines the educational effects of living at or below the poverty level for young children. The author examines several long-term and short-term studies relating to the physical evidence of developmental effects of poverty on childhood learning and the long term effects. Finally, this article offers several interventions that can help meet the needs of the most needey students.

Poverty and Learning: The Effects of Poverty in the Classroom

The great "War on Poverty" began in 1964 and was addressed again by President Clinton in 1996, as well as by every president since that time (Flores 2014; Ehrenfreund 2016). Even so, the U.S. Census reports an increase in the U.S. poverty levels from 14.3 percent to 15.1 percent (Staff, 2017). According to the current U. S. Government poverty rate, a family of four lives on between $22, 314 -$24,000 a year (Edin 2014; Staff 2017). Current figures equate to 46.2 million men women and children living at or below the poverty rate as of 2010 (Staff 2017; a CCHD Initiative 2015; Ehrenfreund 2016). The figures are even greater if one considers only the percentage of children living at or below the poverty level. While poverty rates differ from source to source, they are reported to be between 19.7 to 22 percent of all children in the U.S. live in poverty (Poverty USA; a CCHD Initiative 2015). Considering these figures, approximately 14.5 to 16 million children presently live in poverty or about 1 in every three children nationwide (Ingraham 2014; Bidwell 2013; Flores 2014). Childhood poverty rates surge even more so with children and parents who are living with a disability; to approximately 29 percent (Poverty USA; a CCHD Initiative, 2015). Over the last two decades, the poverty rates in the United States have become one of the highest of any of the wealthiest nations. An article by Shaefer and Edin, 2014, showed that a new, more perilous level of poverty has emerged in the years since 1996 (Edin, 2014). Another article confirms the existence of "extreme poor" living on either no income or less than $2 per person per day (Ehrenfreund, 2016). The "extreme poor" arose after the welfare reform of 1996 and continued to grow with great prevalence and places

newer and more vulnerable generations of children at even greater risk (Edin 2014; Ehrenfreund 2016).

Just as there are cultural differences within every aspect of our country, so are there regional differences in the poverty levels across America. According to the United States Department of Agriculture, areas of poverty concentration within certain areas bound by religion, ethnic groups, counties, and neighborhoods (Farringan, 2017). The census reports allow that the differences in poverty clusters matters regarding the number of students identified, number of services available to students, and the changing economic status' in the given areas. However, areas historically affected by prevalent poverty distinguished as No metro appear mostly in the Southwest and Southern states (Farringan, 2017). This expanse notably inundated with deindustrialization and the influx of Hispanic populations in agricultural areas over the last two decades (Farringan, 2017). Historically, the south has been a concentrated area of childhood poverty. However, the current trends seem to indicate that "hot pocket" areas of childhood poverty are emerging in the Northern Midwest and Southwest (Luhby, 2015). Many of these "hot pocket" areas are showing rates as high as 23 percent (Poverty USA; a CCHD Initiative, 2015). The effects of poverty on the ability of students to learn are not regional, cultural, or biased in any other facet.

Many studies have shown that children living in poverty face many issues that remain with them throughout their lives (Bidwell, 2013). Reports link a number of adverse situations shown to impact children living in poverty from an early age to their ability to develop psychologically and emotionally at the rate comparable to their peers (Hart 2017; Slade 2015). Children living in poverty are assessed at a much greater risk for poor overall educational outcomes (Flores, 2014).

Constructs of educational learning in childhood are varied and complex. However, repeatedly voiced throughout research are several key risk factors that overwhelming connect learning deficits among children living in poverty and lower educational outcomes. Numerous studies document the effects of poverty on families and indirectly on children, and are now beginning to acknowledge the associated effects of poverty on the cognitive development and associated lower academic performance (Hair, Hanson, Wolfe, & Pollak, 2015). This review of the literature will identify the areas of concern for the educational community as well as provide strategies that will assist in meeting the needs of millions of students now living in poverty.

Factors associated with childhood poverty and lower educational outcomes for the child negatively affect the development of their social and emotional competence that lasts well into adulthood (Thompson, 2013). As children develop and grow from infancy into school age, there are specific milestones essential to motor, neural and emotional development (Joan Lubby et al. 2013; Hair et al. 2015; Hart 2017; Chang 2017). These psychological and emotional advances enable children to develop characteristics that enhance or delay their ability to learn and retain information relative to successful learning (Kwon 2015; Chang 2017).

In their article, The Impact of Poverty on Educational Outcomes for Children (2007), Ferguson, Bovaird, and Mueller indicated that poverty arrested children's readiness for school in the areas of health, home life, schooling, and neighborhoods (Ferguson, 2007). These interrelated areas create an inconsistency associated with literacy and language development that further impedes

school readiness (Budge, 2016). The risk factors associated with delayed readiness for school caused by exposure to poverty are shown to have a lasting effect on the student's ability to respond to the copious requirements needed to be successful in the learning environment (Chang, 2017). Recent research indicates that children living within the constraints of constant stress are associated with smaller than average brain volumes in developmental areas of memory and emotion (Bidwell 2013; Stromberg 2013; Joan Lubby et al. 2013). A Policy Brief sent out by the University of California, Davis shared thoughts of key risk factors clearly associated with the delay in cognitive development of children in poverty (Thompson 2013; Hart 2017; Hair et al. 2015). Another study shows that there is physical evidence showing the effects beyond the environmental factors that plague children living in poverty (Bidwell, 2013). Further, other researchers found that families living in poverty are more likely to have children with a lower interest in school and due to depression related to their lower socioeconomic status, are often associated with poor behavior in school (Hart, 2017). Children who are unable to assess their physical and emotional health are more likely to be truant, absent and to become dropouts (Hart, 2017). These findings are substantiated by others in that the extent of deferment is directly related to the incidence, depth, duration, and timing of the deprivation (Ferguson 2007; LSU Online 2017; Jensen 2013). Another study indicated that factors affecting deficits in learning associated with poverty are transmitted across generations creating a generational risk of poverty (Thompson, 2013). This study also specified that reversal of the compounding effects of poverty is possible by breaking the "generational poverty" cycle through forms of economic assistance as well as services addressing the emotional consequences (Thompson, 2013).

Knowledge is the key to curative measures regarding preventing educational and continued failure for children of poverty. Through recent studies, schools have learned that children residing in poverty are more likely to lag behind their grade level peers in literacy, math, the sciences, and indeed in social inadequacies, presenting poor educational outcomes (Flores 2014; Budge 2016; Birdsong 2016). Research also indicated that physical changes within the brain show persistent poverty influences not only the educational outcome but can duly impact the life outcomes of children living in long-term poverty (Ferguson 2007; Stromberg 2013; Slade 2015; Kwon 2015; Hart 2017). Many studies reviewed showed that poverty is a national problem and that it is a "generational" issue. They also indicated that interventions aimed at introducing the means of breaking this chain of poverty could, in fact, transmute the link between poverty and lower educational outcomes (Lubby et al. 2013; Edin 2014; Flores 2014; Ehrenfreund 2016). In this time of welfare reform, how can the communities and school districts venture to intervene in the lives of children living in poverty and make a lasting effect? Below is a short list of interventions that were found to be successful in some areas and may very well be used in others to assist in lessening the effects of poverty on educational communities.

Interventions

- Better fund programs aimed at intervening in early childhood opportunities for at-risk students (LSU Online, 2017).

- Funding programs that encourage parents of preschoolers to send their children to approved preschools to increase their language learning, motor, and neural development.

- Increasing the availability of breakfast and lunch programs and assistance with food subsidies for weekends and holidays.

- Provide funding for neighborhood library programs that help parents increase vocabulary and literacy learning.

- Providing before and after school tutoring is one way of assisting older students who lag academically.

- Providing funding for parent centers to present not only learning materials but offer parent and caregiver training sessions.

- Offer more professional development for teachers and school officials to develop strategies that help diversify teaching methods.

- Training for Counselors and administrators in identifying resources available for parents and caregivers to help with rent, clothing, and other necessities.

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