Spring 5-1-2023

Using Simulation Technology to Train Teacher Candidates in Classroom Management

Chelsea Marelle

Recommended Citation
Marelle, Chelsea, "Using Simulation Technology to Train Teacher Candidates in Classroom Management." Dissertation, Georgia State University, 2023.
doi: https://doi.org/10.57709/35359547

ACCEPTANCE

This dissertation, USING SIMULATION TECHNOLOGY TO TRAIN TEACHER CANDIDATES IN CLASSROOM MANAGEMENT, by CHELSEA MARELLE, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education & Human Development, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.

_____
Claire Donehower, Ph.D.
Committee Chair

_____
Sarah Hansen, Ph.D.
Committee Member

_____
Lauren Boden, Ph.D.
Committee Member

_____
Andrew Roach, Ph.D.
Committee Member

_____
Date

_____
Brendan Calandra, Ph.D.
Chairperson, Department of Learning Sciences

_____
Paul A. Alberto, Ph.D.
Dean, College of Education &
Human Development

AUTHOR'S STATEMENT

By presenting this dissertation as a partial fulfillment of the requirements for the advanced degree from Georgia State University, I agree that the library of Georgia State University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote, to copy from, or to publish this dissertation may be granted by the professor under whose direction it was written, by the College of Education & Human Development's Director of Graduate Studies, or by me. Such quoting, copying, or publishing must be solely for scholarly purposes and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without my written permission.

_____

Chelsea Marelle

NOTICE TO BORROWERS

All dissertations deposited in the Georgia State University library must be used in accordance with the stipulations prescribed by the author in the preceding statement. The author of this dissertation is:

Chelsea Jennings Marelle
Department of Learning Sciences
College of Education & Human Development
Georgia State University

The director of this dissertation is:

Claire Donehower
Department of Learning Sciences
College of Education & Human Development
Georgia State University
Atlanta, GA 303

CURRICULUM VITAE

Chelsea J. Marelle
1481 Liberty Parkway NW
Atlanta, GA 30318

EDUCATION

2020- Present	PhD, Education of Students with Exceptionalities Georgia State University
2013-2015	M.Ed., Special Education Vanderbilt University
2008-2012	B.S., Early Childhood Education Valdosta State University

PROFESSIONAL EXPERIENCE:

2022- Present	*University Supervisor* Georgia State University
2021-Present	*Graduate Research Assistant* Georgia State University
2020-2021	*GaLEND Trainee* Georgia State University
2015-2020	*Special Education Teacher* Gwinnett County School District Little Rock School District

PUBLICATIONS:

Donehower Paul, C., Hansen, S., **Marelle, C.,** & Wright, M., (2023). Incorporating technology into instruction in early childhood classrooms: A systematic review. *Advances in Neurodevelopmental Disorders.*

Marelle, C., Tanner, E., & Donehower Paul, C., (Accepted for Publication, 2022). Special education teacher training to address challenging behaviors for student with ASD in the classroom setting: A systematic review of the literature. *Review Journal of Autism Developmental Disorders.*

Marelle, C., & Donehower Paul, C. (2022) Four Components for Training Special Education Teachers in Behavior Management Skills. *Journal of Special Education Preparation*, 2(3), 40-47.

Marelle, C., Vinoski Thomas, E., & Paul, C. (2022). A survey of wireless technology supporting individuals with intellectual and developmental disabilities in the workplace. *Journal of Special Education Technology.*

Donehower Paul, C., Hansen, S., **Marelle, C.,** Pennington, R., Grace, B., Pinczynski, M., Enriquez, J., DeMarco, J., & Vasquez, E. (2022). Cracking the social Code: A STEM and social skills curriculum for students with intellectual and developmental disabilities. Submitted to *2022 Division for Autism and Developmental Disorders Online Journal*, 70, 70.

Donehower Paul, C., Vinoski Thomas, E., **Marelle, C.,** Hussain, S.Z., Doulin, A.M., & Jimenez, E. (2022). Using wireless technology to support individuals with intellectual and developmental disabilities in vocational settings: A focus group study. *Vocational Rehabilitation*, *56*(3), 303-312.

Marelle, C. (2021). The Evolution of the Perfect Classroom Setup. In: Quinzio-Zafran, A. & Wilkins, E. *The New Teacher's Guide to Overcoming Common Challenges.* New York, NY: Routledge

Lambert, J. M., Lloyd, B. P., Staubitz, J. L., Weaver, E. S., & **Jennings, C. M.** (2014). Effect of an automated training presentation on pre-service behavior analysts' implementation of trial-based functional analysis. *Journal of Behavioral Education*, *23*(3), 344–367. https://doi.org/10.1007/s10864-014-9197-5

Marelle, C., DeMarco, J., Enriquez, J., Grace, B., Pinczynski, M., Grace, B., Donehower, C., Hansen, S., Pennington, R., & Vasquez, T. (In Review, 2022). Cracking the social code: A systematic literature review. *Journal of Special Education and Technology*.

Marelle, C., Donehower Paul, C., Hansen, S., Roach, A., & Boden, L. (In Review, 2022) Using Mixed-Reality to Train a Preservice Teacher in Behavior Management Skills for Students with ASD. *Teacher Development.*

PRESENTATIONS:

Marelle, C. (2023, March 1-4). *Virtual reality to train teacher candidates in classroom management skills.* [Poster Presentation]. CEC 2023 Convention and Expo, Louisville, KY

Pinczynski, M., Enriquez, J., **Marelle, C.,** Rose, M. & Hirn, J. (2023, March 3). *Increasing Access to STEM Instruction for Students with ASD/ID.* [Presentation]. Council for Exceptional Children, Louisville, KY.

Marelle, C. (2023, January 18-20). *Using TeachLivE to train a preservice teacher of ASD in classroom management skills.* [Poster Presentation]. International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL

Marelle, C. (2023, January 18-20). *Special education teacher training to address challenging behaviors for students with ASD in the classroom setting: A systematic review.* [Poster Presentation]. International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL

Pinczynski, M., Enriquez, J., **Marelle, C.,** Demarco, J., Grace, B.., & Rose, M, (2023, January 20). *Increasing Access to STEM Instruction for Students with ASD/ID.* [Presentation]. International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL.

Pennington, R., Donehower, C., **Marelle, C.,** & Sanchez Enriquez, J., (2022, November 14-17) *Cracking the Social Code: A STEM and Social Skills* Curriculum [Conference Presentation]. OCALICON. Online. United States.

Marelle, C. (2022, November 8-11). *Using TeachLivE to train a preservice teacher of ASD in classroom management skills.* [Pecha Kucha Session]. Teacher Education Division 45th Annual Conference, Richmond, VA.

Marelle, C. (2022, November 8-11). *TeachLivE to train teacher candidates of students with ASD in classroom management*. [Poster Session]. Teacher Education Division 45th Annual Conference, Richmond, VA.

Marelle, C. (2022, November 8-11). *Recommendations for effective training opportunities for special education teachers in behavior management.* [Multiple Paper Session]. Teacher Education Division 45th Annual Conference, Richmond, VA.

DeMarco, J., **Marelle, C.,** Rose, M., Vasquez, T., Grace, B., Hirn, J., Pinczynski, M. (2022, November 8-11). *Bridging STEM and social skill instruction for students with ASD/ID*. [Paper Session]. Teacher Education Division 45th Annual Conference, Richmond, VA.

Marelle, C., Tanner, E., Donehower Paul, C., (2022, April 15). *Special education teacher training to address challenging behaviors for student with ASD in the classroom setting: A systematic review of the literature*. [Poster Presentation]. Graduate Student Association Annual Conference, Georgia State University, Atlanta, GA, Virtual

Donehower, C., Vasquez, T., Pennington, R., Hansen, S., Demarco, J., **Marelle, C.,** Enriquez, J., Pinczysnki, M., Grace, B., (2022, January 13-21). *Cracking the social code: A STEM and social skills curriculum for students with ASD & ID.* [Lecture Presentation] International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL

Marelle C., DeMarco, J., Enriquez, J., Grace, B., Pinczynski, M., Grace, B., Donehower, C., Hansen, S., Pennington, R., Vasquez, T. (2022, January 13-21). *Cracking the social code: A systematic literature review.* [Poster Presentation]. International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL

Marelle, C. & Tanner, E. (2022, January 26-28). *Teacher training to address problem behaviors for ASD in the classroom.* [Poster Presentation]. International Conference on Autism, Intellectual Disability, & Developmental Disabilities, Clearwater Beach, FL

Marelle, C. & Tanner, E. (2022, January 13-21). *Teacher training to address problem behaviors for ASD in the classroom: A systematic review*. [Poster Presentation]. Council for Exceptional Children Convention and Expo, Orlando, FL

Lambert, J. M., Lloyd, B. P., Staubitz, J. L., Weaver, E. S., & **Jennings, C. M.** (May 22-26, 2015). Effect of an automated training presentation on pre-service behavior analysts' implementation of trial-based functional analysis. [Multiple Paper Session] Association for Behavior Analysis International 41st Annual Convention, San Antonio, TX.

PROFESSIONAL MEMBERSHIPS

Council for Exceptional Children
Division on Autism and Developmental Disabilities (DADD)
Teacher Education Division (TED)

Using Virtual Reality to Train Teacher candidates in Classroom Management

by

Chelsea Jennings Marelle

Under the Direction of Claire Donehower

ABSTRACT

This study used a multiple baseline across behaviors design to analyze the effects of didactic training plus simulated rehearsal and feedback on a preservice teacher's implementation of behavior management skills (i.e., opportunities to respond, behavior specific praise, token reward system) with students with autism spectrum disorders (ASD). Results indicate a functional relation between the intervention package and increased teacher performance across all three behavior management skills. Participants reported positive perceptions and experiences of the use of simulated classroom environments like TeachLivE^{TM} as a training component. Implications for future research and practice are provided.

INDEX WORDS: Simulation technology, Teacher candidates, Special education teachers, Teacher preparation, Classroom management, Behavior management

USING SIMULATION TECHNOLOGY TO TRAIN TEACHER CANDIDATES IN CLASSROOM MANAGEMENT

by

CHELSEA MARELLE

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Philosophy

in

Education of Students with Exceptionalities

in

Department of Learning Sciences

in

the College of Education & Human Development

Georgia State University

Atlanta, GA
2023

DEDICATION

This is dedicated to my daughter, Kinley, and her future siblings. I hope this inspires you to have the courage to chase your dreams and to trust in God's plan for your life.

ACKNOWLEDGMENTS

First and foremost, I have to thank God for the incredible opportunity to accomplish this goal. In the moments when things got tough, He always sent a sign that I was on the right path that kept pushing me through.

To my husband, I am forever indebted to you for your endless love, encouragement, and incredible listening ears. You never once waivered in your support and never showed an ounce of doubt that we made the right decision and for that I am forever grateful. I could have never accomplished this goal without your support and your pep talks (I was listening even if I didn't want to hear them). The sacrifices you made to get us here are incredible and I thank God every day that he made you for me.

To my mom and dad, thank you for always pushing me to chase my dreams. Thank you for instilling the work ethic and determination that got me through this adventure. Jessica and Shelby, thank you for picking up the phone whenever I called. Thank you for listening and supporting me through the ups and downs. Thank you to my always loyal girl, Ryder, who sat with me through classes and stayed up with me during late night work sessions.

To Kathy and Joe Marelle, thank you for your support and encouragement along the way. More importantly, thank you for raising a man who supports me in everything I do and encouraged me to accomplish my dream. He is truly the biggest blessing in my life, and I have you both to thank for that.

To my family and friends, thank you for your incredible support. Thank you for asking and thank you for not asking. Somehow each of you knew exactly when I needed to chat about it and when I didn't. Emily and Jess, thank you for your friendship and for being my soundboard when things got tough.

To my advisor, Dr. Donehower… I mean Claire, thank you for being an excellent role model of how to be an academia mom! I will never be able to thank you enough for your support, guidance, and understanding over the past three years. I have learned an incredible amount from you, and I appreciate every opportunity you have given me.

To my committee, Dr. Hansen, Dr. Boden, and Dr. Roach, thank you for your guidance and support. Every question and brilliant idea you provided has improved me as a researcher and future faculty member.

Finally, to my former students and their families, colleagues, and especially my Otter Creek Family, this started with you. You took a chance on me and gave me the freedom and encouragement to grow as an educator. You supported me and allowed me to try innovative techniques and allowed me to fall on my face. I hope my former students know, that not a day goes by that I don't think about them, and I can't wait to share their stories with my future special education teacher candidates.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

USING SIMULATION TECHNOLOGY TO TRAIN TEACHER CANDIDATES IN CLASSROOM MANAGEMENT: A SYSTEMATIC LITERATURE REVIEW

One of the most challenging and complicated responsibilities of teachers is classroom management which has been identified as an essential component for effective teaching (Hardin, 2008). In fact, classroom management is consistently reported as one of the main reasons that teachers are choosing to leave the field (Sciuchett, 2019). New teachers (White & Mason, 2006) and experienced teachers (Watson, 2006) have all reported a lack of preparedness and confidence when it comes to classroom management. Furthermore, managing disruptive behaviors in the classroom has been reported as one of the top stressors for teachers with less than five years of experience (Shernoff et al., 2016). Limited training on how to manage disruptive behaviors efficiently in the classroom is reported as one of the largest contributors to low teacher retention rates (Ingersoll, 2002; Shernoff et al., 2016).

Teachers are seldom provided adequate training on these strategies to ensure they can effectively implement them with fidelity in the classroom setting (Lerman et al., 2004; Loiacono & Allen, 2008; Morrier et al., 2010). In fact, practice opportunities with immediate feedback are often minimal or completely absent in teacher preparation programs (Denton & Hasbrouch, 2009; Shernoff et al., 2015). One of the most effective ways to learn and master classroom management skills is through real-life classroom experiences (Garland et al., 2016). In teacher preparation programs, practice opportunities are often limited to a practicum experience and/or a student teaching placement which are tied to a grade and considered high stakes in order to meet graduation requirements. In these high stakes situations teacher candidates are often not willing to try new skills for fear of failing. It has been documented that there is a lack of authentic learning opportunities centered around classroom management skills for teacher candidates

(Nordvall et al., 2014). Once new teachers enter the field, they receive minimal guidance and support in behavior management (Grossman & McDonald, 2008). Instead, they are expected to learn on the job.

One option that is currently being examined to support professional development of preservice and in-service special educators in the area of classroom management is mixed reality simulation. Mixed-reality simulation, also known as simulation technology or immersive virtual reality, is a novel way to provide participants with an opportunity to practice learned skills in a controlled environment prior to real world application (Billingsley et al., 2019). Prior to its implementation in educational contexts, simulation technology has been successfully used to provide training and practice opportunities in other professional fields.

In fact, simulation technology is often used in providing training opportunities in other professions. For example, Leger and colleagues (2011) used simulation technology to recreate a realistic business environment that allowed learners to develop IT competencies and skills. Alinier et al. (2006) used simulation technology to improve the performance of nursing undergraduate students using the Objective Structured Clinical Examination. A large-scale review of 182 studies that used simulation technology to train healthcare workers in resuscitation skills found that using the technology during training was effective (Mundell et al., 2013). Simulation technology has also been used in STEM training (Campos et al., 2020), orthopedics (Jackson et al., 2020), and flight training (Haslbeck et al., 2014).

Currently, majority of the research related to the integration of simulation technology into training teachers in classroom management skills has highlighted a more qualitative approach. For example, Stavroulia et al. (2019), examined the emotional impact that using virtual reality to provide teachers with real-life experiences for training had on teachers. A survey conducted by

Altwood et al. (2020), found that teacher candidates do in fact have an interest in using virtual reality for training.

Although the research highlighting the impact of simulation technology on teacher preparation programs has grown significantly in the last few years, there are still gaps in understanding in the impact on classroom management skills. There are also gaps surrounding the ability of the teacher to transfer the skills rehearsed in the simulator to the classroom environment. Therefore, a review of the current literature is warranted to highlight the impact that simulation technology can have on special educators and their ability to manage challenging behavior in their classroom.

The purpose of this systematic review is to explore the various mixed-reality and virtual reality interventions that have been used in training special education teacher candidates in classroom and behavior management skills. The increasing prevalence of challenging behaviors in the classroom that is contributing to the high turnover rate of special education teachers validates the demand for a reflection of how special education teachers are being trained using these technologically advanced and effective methods. The main questions that are addressed in this systematic review are:

1. Which simulation technology platforms are being used to train preservice and in-service special education teachers in classroom management skills?
2. What effect does simulation have on the teacher implementation performance of classroom management skills by preservice and in-service teachers in and or out of the simulator?
3. What are the components of effective training models that include simulation for classroom management?

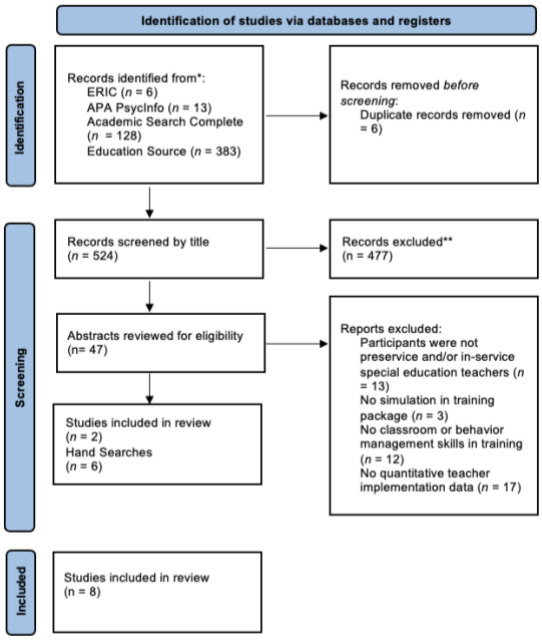
Methods

Search Procedures

Systematic searches were completed using four electronic databases: ERIC, APA PsycInfo, Academic Search Complete, and Education Source. Ancestral searches were completed which included both forward and backward searches. There was no limitation on the publication date of included studies. The search was limited to only peer reviewed articles. The following search terms were used ("preservice teacher" or "student teachers" or "pre-service teachers" or "special education teacher") and (“special education” or "special needs" or “disabilities”) and ("Behavior Management" or "Behavior Intervention" or "Classroom Management") and (“simulation” or "mixed reality" or "virtual reality"). The initial search returned 501 studies for review. Figure 1 displays a PRISMA flowchart of the search procedures.

Figure 1.1

PRISMA Search Procedures



Inclusion Criteria

Studies were included in this review if they (a) included preservice and/or in-service special education teachers as participants, (b) had simulation as part of the training package, (c) trained the participants in classroom and/or behavior management skills/ strategies, and (d) included quantitative data regarding the fidelity of participant implementation.

Data Extraction

Data were extracted related to the following variables: (a) number of participants and category (i.e., special education teacher, preservice teacher, etc.); (b) type of simulation technology; (c) components of the training package; and (d) outcomes or effectiveness of the intervention.

The components of the training package were coded into three categories. Studies that are marked *Didactic Presentation* included portions of the training that used a PowerPoint or some other form of presentation. Studies that included *Performance Feedback/ Coaching* included a portion of the training that the participants were provided with feedback following an observation of implementation or coaching during a practice session. Studies marked *Reflection* provided an opportunity for the participants to reflect, through writing or interview, on their performance.

The effectiveness of intervention rating system was used to aid in categorizing the fidelity results for each intervention which were all reported in various manners (Alexander et al., 2015; Lang et al., 2012; Machalicek et al., 2008). The rating system categorizes the intervention effectiveness into three groups: *Positive*, *Mixed*, and *Negative.* The studies that have all participants experience some increase in knowledge or ability from baseline to intervention

are labeled as *Positive* effectiveness. The studies that show improvement for one or more participant while one or more participant did not show improvements are rated as *Mixed.* The studies where no participants showed improvement, or one participant improve in one skill but not the others are rated *Negative.*

Interrater Reliability

Following a trial search protocol used to ensure mastery of the search procedures, the second author followed the same search procedures to select included articles. The same second author coded 33% of the included studies. 100% agreement was reached for the search procedures as well as the coding of the articles.

Results

A total of eight studies met the inclusion criteria and were included in this review. The included table organizes the results of the search including participant, study design, simulation technology, components of the training package, dependent variables, generalization, and outcome.

Table 1.

Review of Literature Results

Citation	Simulation Technology	IV			DV	Generalization	Outcome
		Didactic	Performance Feedback/ Coaching	Reflection			
Dawson & Lignugaris/ Kraft, 2017	TLE TeachLivE™	X	X	X	-Specific praise -Praise around -Error correction	Y	Positive
Garland et al., 2016	TLE TeachLivE™		X	X	Management of: -Antecedents -Discriminative stimuli -System of least prompts	N	Positive
Horn & Rock, 2021	Mursion™		X		Behavior specific praise	N	Positive
Horn et al., 2023	Mursion™		X		-Behavior specific praise -Equitable praise rates and variety	N	Positive
Murphy et al., 1987	Curry Simulation		X		Teacher responses to disruptive behaviors	N	Positive
Pas et al., 2016	TLE TeachLivE™	X	X		The *Assessing School Settings: Interactions of Students and Teachers*	Y	Positive
Peterson-Ahmad, 2018	TLE TeachLivE™		X		Opportunities to respond	N	Mixed
Shernoff et al., 2021	Interactive Virtual Training for Teachers				The Classroom Strategies Scale	Y	Positive

Participants and Study Design

Table 1 displays the participant descriptions. In total there were 81 special educators and 9 participants who were listed as “other” because they were enrolled in a general education program that took part in the included studies. Of the 90 total included participants, 51% (n = 46)

were in-service special educators and 39% (*n* = 35) were preservice special educators. Of the six studies that provided more participant demographic details, 83% (*n* = 65) of the participants were female and 17% (*n* = 13) were males. Two studies (Horn et al., 2023; Peterson-Ahmad, 2018) did not list the gender of the participants. The participant age was described in three of the eight included studies. The average age of the participants ranged from 39 years (Shernoff er al., 2021) to 40.5 years (Dawson & Lignugaris/Kraft, 2017) and was also described as 23-30 years (Garland et al., 2016).

Of the eight included studies, 50% (*n* = 4) were single case design studies, 25% (*n* = 2) were group design, 12.5% (*n* = 1) was a case study with a group design, and 12.5% (*n* = 1) was a mixed method study. The four studies that used single case designs all implemented a variation of a multiple baseline design.

Simulation Technology

The most used simulation technology was TLE TeachLivE™ which was used in 50% (*n* = 4) of the included studies. Mursion™ was a part of the intervention package in 25% (*n* = 2) of the included studies. The other simulation technology platforms used included Curry Simulation and IVT-T (interactive virtual training for teachers).

TLE TeachLivE™. TLE TeachLivE™ provide full immersion teaching experiences and represents many of the complexities that exist in a real classroom (Dieker et al., 2008; Dieker et al., 2014). Unlike other classroom simulators, TLE requires verbal teaching interactions in front of a classroom of student avatars that provide immediate and realistic response (Dieker et al., 2014; Elford, 2013). This simulation technology is controlled by interactors, meaning the trainer can control the complexity of the instructional environment by adding more intense or less intense challenging behaviors. This provides participants with a realistic but safe environment to

practice and receive immediate feedback. TLE is used solely for research purposes out of the University of Central Florida.

Mursion™. Formerly known as TeachLivE™, Mursion™, is a mixed-reality environment comprised of human-controlled avatars and computerized components (Dieker et al., 2014). Similar to TeachLivE™, teacher participants are able to practice classroom management skills in a safe environment (Dieker et al., 2014). More specifically, Mursion™ is a large for-profit software company that leases the software to organizations and universities for mixed reality simulation use (Murawski & Ireland, 2022)

Curry Simulation. The Curry Simulation is a microcomputer program that simulates typical classroom interactions between teachers and software-defined pupils (Murphy et al., 1987). The program was designed from the results of four studies that indicated that selected instructional behaviors of the student teachers during simulation sessions were influenced by the programmed characteristics (Strang et al., 1985; Strang & Loper, 1983, 1984, 1985). For the purpose of the included study (Murphy et al., 1987), the Curry Simulation program was expanded to include a pupil misbehavior component where the misbehavior of the pupils in the simulator could be adjusted by the system operator. For the included study, the misbehavior selected was pupil talk outs.

Interactive Virtual Training for Teachers. Interactive Virtual Training for Teachers (IVT-T) is an internet-based simulation training model developed by a group of computer scientists (Shernoff et al., 2021). This program was created from graphics and programming which was then assessed through usability testing and reviewed by school/ clinical psychologists who created the content for the system (Shernoff et al., 2021). The participants are able to practice implementing evidence-based behavior management strategies by interacting with

virtual characters who engage in challenging behaviors in the classroom. The content of the program was guided by a functional behavior framework which includes connecting antecedent and consequences to challenging behaviors and focusing on how the environment can impact those behaviors (Kazdin, 2005; Shernoff & Kratochwill, 2003; Shernoff et al., 2021).

Components of Training

Didactic Presentation. Didactic training methods included a component of training where information was presented to the participants through PowerPoint or a similar platform. Of the included studies, 25% (n = 2) included a didactic training component. For example, Dawson & Lignugaris/Kraft (2017), presented 7-12 minutes of instructional videos, provided a handout regarding the desired participant behaviors, and quizzed participants prior to moving into the simulation practice. Pas et al. (2016), provided professional development to the in-service teacher participant prior to the guided practice in the simulator.

Performance Feedback/ Coaching. The most common component of training was performance feedback/coaching which was included in 87.5% (n = 7) of the included studies. Performance feedback/coaching was solely used in partnership with only the simulation technology in 62.5% (n = 5) of the included studies. For example, Horn et al. (2023), used eCoaching to provide in session feedback on participant use of behavior specific praise in the simulation sessions. Performance feedback/coaching was use as a part of a training package that included other training components and simulation technology in 25% (n = 2) of the included studies. For example, in Pas et al. (2016), the training package began with a didactic presentation and then participants received coaching during the guided practice in the simulation sessions.

Reflection. A study was marked for reflection if it included a portion of the raining package that required participants to partake in a written or verbal reflection of their own

performance. that Dawson & Lignugaris/Kraft (2017), was the only study to include a portion of reflection.

Dependent Variables

Teacher response to behaviors served as the dependent variables for 50% (*n* = 4) of the included studies. More specifically, behavior specific praise served as the only or part of the dependent variable in 37.5% (*n* = 3) and the various types of teacher responses were tracked in 12.5% *(n* = 1). Other dependent variables included management of antecedents (Garland et al., 2016), interactions of students and teachers measure (Pas et al., 2016), and The Classroom Strategies Scale (Shernoff et al., 2021). One study, Peterson-Ahmad, 2018, tracked the use of opportunities to respond to manage classroom behaviors.

Generalization and Outcome Measure

Of the included articles, 100% (*n* = 8) reported some form of improvement in participant fidelity. Out of the eight included studies, only 37.5% (*n* = 8) included a measure of generalization to the classroom while 62.5% (*n* = 5) did not take any measurements in the classroom. Only one study received a mixed outcome measure while 87.5% (*n* = 7) received a positive measure meaning all participants showed some degree of improvement across conditions.

Discussion and Future Research

The present systematic review examined the body of research surrounding the use of simulation technology in training preservice and in-service special educators in classroom management skills. Given the limited amount of available literature, it can be concluded that further research is needed to be able to fully examine the implications that simulation technology can have on teacher preparation. However, the results have demonstrated that simulation

technology does have the potential to improve the implementation fidelity of classroom management procedures for special educators. This review concludes that simulation technology partnered with performance feedback and coaching has the potential to leave a lasting and positive impact on teacher preparation. While analyzing the limited literature regarding the use of simulation technology to increase the implementation fidelity of teachers using classroom management skills a few themes emerged. First, the broader training packages that included simulation practice had an impact on outcomes. Second, participant demographic information highlighted some potential barriers as well as directions for future research. Finally, more attention should be brought to the inclusion of generalization measures into the classroom following the simulation training.

Although this review includes only eight studies, the researchers were still able to examine the training packages that reported a positive effect on the teacher participants. Training packages that partnered simulation technology with performance feedback and coaching demonstrated an increase in the participant's ability to demonstrate a high implementation fidelity of the trained skills. Notably, the training packages that consisted of a reflection piece for the teacher participants also resulted in positive findings across all participants. It is also important to note that the one study (Dawson & Lignugaris/Kraft, 2017) that included a didactic presentation, performance feedback and coaching, and a reflection piece with the TLE simulator resulted in a positive impact on the teacher fidelity.

Another interesting takeaway from this review of the current literature is the participant demographic information. Not surprising is the number of female participants far outweighing the number of male participants. Surprisingly the number of preservice teacher participants outweighed the number of in-service participants. This is interesting is because accessing to the

simulation technology can be a daunting task due to time constraints of in-service teachers, contracts, and financing which poses a challenge to create opportunities for teachers who are already in the field to participate in simulation practice. Meaning, it is assumed that simulation technology opportunities would be more likely for teacher candidates.

Lack of generalization opportunities into applied settings (i.e., classrooms) should also be highlighted as a notable finding. Only three studies included a measure of generalization to the classroom (Dawson & Lignugaris/Kraft, 2017; Pas et al., 2016; Shernoff et al., 2021). Although the purpose of the simulation technology is to provide participants with a safe practice space that closely replicates the classroom, it is still important to measure the ability of the participants to generalize those skills into their everyday teaching environment. Future research should examine the effect of continuing performance feedback and coaching into the regular classroom as well if necessary.

Limitations

The results of this study should be considered with a few limitations in mind. First, the search procedures emphasized the lack of research by heavily narrowing the inclusion criteria. The lack of date limitation in the search procedures should be noted as a limitation because there was no quality measure included in the data extraction methods.

Peterson-Ahmad (2018) is the only study that was rated ‘mixed’ on the outcome measure. The dependent variable for this study was teacher implementation of opportunities to respond. During the intervention, participants were working to provide OTRs in the TeachLivE simulator. Of the eight included participants only four were able to make improvements in the rate of OTRs provided during each lesson. This study highlights the need to further explore the opportunity to use TeachLivE to improve teacher delivery of an appropriate rate of OTRs per minute by

practicing in the simulator first. In this particular study, all data was collected in the simulator which could explain the variability in the results for the participants.

The purpose of this review was to explore a very specific type of simulation research by narrowing this study to only include literature that include teacher fidelity data. Therefore, the lack of volume of research included in this research can be credited to the inclusion criteria that required included studies to include data on teacher performance. As previously mentioned, there is existing research that has highlighted the perspectives and opinions of teachers on the use simulation technology in teacher preparation. The results of those studies partnered with the results of this literature review indicate the need for continued research in this area. Future research should address the usability and acceptability of simulation technology in pre-service teacher preparation and in-service teacher professional development.

The search procedures did not include a date range, and instead opened the results up to research from any date. The results included studies from 1987. Some of the methods of the study would not be applicable to research in the current era but the results of the study were still a good fit to the scope of this literature review. The inclusion of the Murphy et al., 1987 study did demonstrate the evolution of simulation technology and highlighted one of the first simulation technology programs. Because there was no quality measure included in this literature review, the results are more challenging to interpret. The purpose of this literature review was to highlight the types of simulation technology that have been used to support classroom management skills. The discussion included highlighting more effective components to include with the simulation technology, but the purpose of this study was to highlight the types of technologies.

In summary, using simulation technology resulted in an increase in fidelity of implementation of the trained classroom management skills in the teacher participants across the eight included studies. In spite of the small number of studies in this literature review, it is still valuable to infer that the results show a promising future of using simulation technology to support preservice and in-service teachers in classroom management skills.

References

Alexander, J. L., Ayers, K. M., & Smith, K. A. (2015). Training teachers in evidence-based practice for individuals with autism spectrum disorder: A review of the literature. *Teacher Education and Special Education*, *38*(1), 13–27. https://doi.org/DOI: 10.1177/0888406414544551

Alinier, G., Hunt, B., Gordon, R., & Harwood, C. (2006). Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. *Journal of Advanced Nursing*, *54*(3), 359–369. https://doi.org/10.1111/j.1365-2648.2006.03810.x

Altwood, A. I., Bruster, B. G., & Bruster, B. G. (2020). An Exploratory Study of Preservice Teacher Perception of Virtual Reality and Artificial Intelligence for Classroom Management Instruction. *SRATE Journal*, 29(2).

Billingsley, G., Smith, S., Smith, S., & Meritt, J. (2019). A systematic literature review of using immersive virtual reality technology in teacher education. Journal of Interactive Learning Research, 30(1), 65–90.

Campos, N., Nogal, M., Caliz, C., & Juan, A. A. (2020). Simulation-based education involving online and on-campus models in different European Universities. *International Journal of Educational Technology in Higher Education*, *17*(1). https://doi.org/10.1186/s41239-020-0181-y

*Dawson M. R., Lignugaris/Kraft B. (2017). Meaningful practice: Generalizing foundation teaching skills from TLE TeachLivE to the classroom. *Teacher Education and Special Education*, 40, 26–50.

Denton, C.A., Hasbrouck, J., 2009. A description of instructional coaching and its relationship to consultation. Journal of Educational and Psychological Consultation 19, 150–175.

Dieker, L. A., Hynes, M., Hughes, C., & Smith, E. (2008). Implications of mixed reality and simulation technologies on special education and teacher preparation. *Focus on Exceptional Children*, *40*(6), 1-20.

Dieker, L. A., Rodriquez, J. A., Lignugaris/Kraft, B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education: Current and future possibilities. *Teacher Education and Special Education*, *37*, 21-33.

Dieker, L. A., Straub, C. L., Hughes, C. E., Hynes, M. C., & Hardin, S. (2014). Learning from virtual students. *Educational Leadership*, *71*(8), 54-58.

Elford, M. D. (2013). Using tele-coaching to increase behavior-specific praise delivered by secondary teachers in an augmented reality learning environment (Doctoral dissertation). Available from ProQuest. (UMI No. 3559157)

*Garland, K. M., Holden, K., & Garland, D. P. (2016). Individualized clinical coaching in the TLE TeachLivE lab: Enhancing fidelity of implementation of system of least prompts among novice teachers of students with autism. *Teacher Education and Special Education*, 39, 47-59. doi:10.1177/0888406415600769

Grossman, P., & McDonald, M. (2008). Back to the future: Directions for research in teaching and teacher education. *American Educational Research Journal*, 45(1), 184-205. doi: 10.3102/0002831207312906

Haslbeck, A., Kirchner, P., Schubert, E., & Bengler, K. (2014). A Flight Simulator Study to Evaluate Manual Flying Skills of Airline Pilots. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 58(1), 11–15. https://doi.org/10.1177/1541931214581003

Hardin, C. J. (2008). Effective classroom management: Models & strategies for today's classrooms. PEARSON.

*Horn, A. L., & Rock, M. L. (2021). Effects of e-coaching during MursionTM simulations on the occurrence and variety of behavior specific praise. In A. Markelz, (Ed.) Ted 2021 Conference Proceedings: Steering into the Future. pp (38-42). Teacher Education Division of the Council for Exceptional Children, Fort Worth, TX.

*Horn, A. L., Rock, M. L., Chezan, L. C., Bobzien, J. L., Karadimou, O., & Alturki, A. (2023). Effects of eCoaching on the occurrence, equity, and variety of behavior specific praise during Mursion™ simulations. *Journal of Special Education Technology*, 016264342311528. https://doi.org/10.1177/01626434231152893

Ingersoll, R.M., Smith, T.M., 2003. The wrong solution to the teacher shortage. Educational Leadership 60 (8), 30–33.

Jackson, T. J., Shah, A. S., Buczek, M. J., & Lawrence, J. T. (2020). Simulation training of orthopedic residents for distal radius fracture reductions improves radiographic outcomes. *Journal of Pediatric Orthopaedics*, *40*(1). https://doi.org/10.1097/bpo.0000000000001387

Kazdin, A.E. (2005). Underlying principles and concepts. In *Parent Management Training* (pp. 35–64). Oxford University Press.

Lang, R., O'Reilly, M., Healy, O., Rispoli, M., Lydon, H., Streusand, W., Davis, T., Kang, S., Sigafoos, J., Lancioni, G., Didden, R., & Giesbers, S. (2012). Sensory integration therapy for autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, *6*(3), 1004–1018. https://doi.org/10.1016/j.rasd.2012.01.006

Léger, P.-M., Charland, P., D. Feldstein, H., Robert, J., Babin, G., & Lyle, D. (2011). Business simulation training in information technology education: Guidelines for new approaches in it training. *Journal of Information Technology Education: Research*, *10*, 039–053. https://doi.org/10.28945/1362

Lerman, D. C., Vorndran, C. M., Addison, L., & Kuhn, S. C. (2004). Preparing teachers in evidence-based practices for young children with autism. *School Psychology Review*, *33*(4), 510-526. https://doi.org/10.1080/02796015.2004.12086265

Loiacono, V., & Allen, B. (2008). Are special education teachers prepared to teach the increasing number of students diagnosed with autism? *International Journal of Special Education, 23*, 120–127.

Machalicek, W., O'Reilly, M. F., Beretvas, N., Sigafoos, J., Lancioni, G., Sorrells, A., Lang, R., & Rispoli, M. (2008). A review of school-based instructional interventions for students with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *2*(3), 395–416. https://doi.org/10.1016/j.rasd.2007.07.001

Morrier, M. J., Hess, K. L., & Heflin, L. J. (2010). Teacher training for implementation of teaching strategies for students with autism spectrum disorders. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *34*(2), 119–132. https://doi.org/10.1177/0888406410376660

Mundell, W. C., Kennedy, C. C., Szostek, J. H., & Cook, D. A. (2013). Simulation Technology for Resuscitation training: A systematic review and meta-analysis. *Resuscitation*, *84*(9), 1174–1183. https://doi.org/10.1016/j.resuscitation.2013.04.016

Murawski, W., & Ireland, A. (2022, November). Beyond Mursion, beyond TeachLivE: Pause and unpack with mixed reality simulation. In *TED 2022 Conference* (p. 80).

Murphy, D. M., Kauffman, J. M., & Strang, H. R. (1987). Using Microcomputer Simulation to Teach Classroom Management Skills to Teacher candidates. Behavioral Disorders, 13(1), 20–34. https://doi.org/10.1177/019874298701300101

Nordvall M., Arvola M., Samuelsson M. (2014). Exploring simulated provocations: Supporting pre-service teachers' reflection on classroom management. In Zaphiris P., Ioannou A. (Eds.), Learning and collaboration technologies, technology-rich environments for learning and collaboration. Lecture notes in computer science (Vol. 8524, pp. 182-193). Berlin, Germany: Springer.

*Pas, E., Johnson, S., Larson, K. E., Brandenburg, L., Church, R., & Bradshaw, C. (2016). Reducing Behavior Problems Among Students with Autism Spectrum Disorder: Coaching Teachers in a Mixed-Reality Setting. *Journal of Autism & Developmental Disorders*, *46*(12), 3640–3652. https://doi.org/10.1007/s10803-016-2898-y

*Peterson-Ahmad, M. (2018). Enhancing pre-service special educator preparation through combined use of virtual simulation and instructional coaching. *Education Sciences*, *8*.

Sciuchett, M. (2019). The development of teacher candidates' self-efficacy for classroom and behavior management across multiple field experiences. *Australian Journal of Teacher Education*, *44*(6), 19–34. https://doi.org/10.14221/ajte.2018v44.6.2

*Shernoff, E. S., Frazier, S. L., Lisetti, C., Delmarre, A., Bibi, Z., & Gabbard, J. (2021). Supporting the Implementation of Evidence-Based Behavior Management Practices through Simulation: A Mixed Method Study. *Journal of Educational & Psychological Consultation*, *31*(4), 463–497. https://doi.org/10.1080/10474412.2021.1875840

Shernoff, E. S., Frazier, S. L., Maríñez-Lora, A. M., Lakind, D., Atkins, M. S., Jakobsons, L., Hamre, B. K., Bhaumik, D. K., Parker-Katz, M., Neal, J. W., Smylie, M. A., & Patel, D. A. (2016). Expanding the role of school psychologists to support early career teachers: A mixed-method study. School Psychology Review, 45(2), 226–249. https://doi.org/10.17105/spr45-2.226-249

Shernoff, E. S., & Kratochwill, T. R. (2003). The application of behavioral assessment methodologies in educational settings. In S. N. Haynes & E. H. Heiby (Eds.), *Comprehensive handbook of psychological assessment* (pp. 365–385). John Wiley & Sons.

Shernoff, E.S., Lakind, D., Frazier, S.L., Jakobsons, L., 2015. Coaching early career teachers in urban elementary schools: A mixed-method study. School Mental Health 7 (1), 6–20.

Stavroulia, K. E., Christofi, M., Baka, E., Michael-Grigoriou, D., Magnenat-Thalmann, N., & Lanitis, A. (2019). Assessing the emotional impact of virtual reality-based teacher training. *The International Journal of Information and Learning Technology*, *36*(3), 192–217. https://doi.org/10.1108/ijilt-11-2018-0127

Strang, H. R., & Loper, A. B. (1983). Microcomputer-based simulation in training elementary teachers. Educational Technology, 23, 30-31.

Strang, H. R., & Loper, A. B. (1984). A microcomputer-based simulation of classroom interaction. Journal of Educational Technology Systems, 12, 209-219.

Strang, H. R., & Loper, A. B. (1985). Microcomputer support of teacher-student dialogue. Journal of Educational Technology Systems, 14,119-128.

Watson, S. B. (2006). Novice science teachers: Expectations and experiences. *Journal of Science Teacher Education*, 17, 279-290. doi:10.1007/s10972-006-9010-y

White, M. & Mason, C. Y. (2006). Components of a successful mentoring program for beginning special education teachers: Perspectives from new teachers and mentors. *Teacher Education and Special Education, 29*(3), 191-201. doi: 10.1177/088840640602900305

USING SIMULATION TECHNOLOGY TO TRIAN TEACHER CANDIDATES IN CLASSROOM MANAGEMENT SKILLS

School districts across the are struggling to hire and retain highly qualified special education teachers (Cowan et al., 2016; Mason-Williams et al., 2020). Across the United States, 49 states have reported shortages of special education teachers (National Coalition on Personnel Shortages in Special Education and Related Services, 2016). Since the passing of the Individuals with Disabilities Education Act (IDEA), the demand for special education teachers has consistently exceeded the supply (McLeskey & Billingsley, 2008). In fact, about 13% of special education teachers leave the field every year and another 20% change to general education, which results in a 33% rate of attrition (Brownell et al., 2018). When asked the reason for leaving the field of teaching special education, behavior management is frequently cited as the most challenging area of teaching and a major contributor to special education teachers' decision to leave (Sciuchett, 2019; Shernoff et al., 2016). In a survey of 38 special education and 32 general education teachers, challenging behavior was reported as having an adverse effect on both teachers and their students (Westling, 2009).

Autism Spectrum Disorders and Off-Tasks Behaviors

Autism Spectrum Disorder (ASD) is a developmental disability that is characterized by social communication deficits and restricted and repetitive behaviors and interests and can include significant challenges in behavior (CDC, 2020a). According to the most recent statistics published by the Centers for Disease Control (CDC, 2020b), 1 in 44 children have been identified with ASD. With this increase in prevalence of ASD, there is an increased demand for teachers who have appropriate training to manage the behavioral challenges that the students with ASD may display in the classroom environment (National Center for Education Statistics, 2013). Behaviors of students with ASD can include aggression, self-injury, hyperactivity, impulsivity, or emotional reactions (CDC, 2020; Munson et al., 2008; Sullivan & Bradshaw, 2012). If not managed appropriately, these behaviors can lead to disruptions in the classroom environment and student learning. To meet this need, preservice teacher training opportunities often focus

on behavior management strategies emphasize increasing desired behaviors such as opportunities to respond (OTRs), behavior specific praise (BSP), and token reward systems (TRS).

Opportunities to Respond (OTRs)

An OTR is an instructional strategy that promotes student engagement and can be provided across a variety of instructional approaches (Haydon et al., 2012). More specifically, OTRs include any teacher-delivered academic related question (e.g., question, demand, request) that gives the student an opportunity to engage in various ways (e.g., verbal response, gesture; Ferkis et al., 1997). Furthermore, an increase in OTRs can lead to increases in academic engagement and decreases in disruptive behavior (Sutherland & Wehby, 2001). Another benefit of providing OTRs in the classroom is that they serve as a behavior management tool by keeping students engaged in the lesson. Additionally, OTRs can be implemented easily by teachers with minimal preplanning to increase student engagement (Simonsen et al., 2008) and achievement (Aronson et al., 1999). Following a quantitative synthesis of single-case design research in this area, Fitzgerald Leahy et al. (2018) found a functional relation between increasing OTRs and improved student behavioral outcomes. According to MacSugar-Gage and Simonsen (2015), the recommended rate of OTRs should be 2.0 to 5.0 per minute. The impact of implementing a high rate of OTRs is significant, especially considering the minimal planning required by a teacher to implement this strategy. The delivery of an OTR followed by a student response also sets the stage for the second classroom management strategy, behavior specific praise (BSP).

Behavior Specific Praise (BSP)

Similar to OTRs, BSP is another simple behavior management strategy that takes very little preplanning for teachers. By definition, BSP is a positive statement directed towards a student that acknowledges a desired behavior using specific, observable, and measurable language (The IRIS Center, 2013). Contrary to general praise, BSP includes the precise behavior exhibited and how it met the teacher's expectations (Kennedy & Jolivette, 2008). In addition, BSP should be sincere, so students are more likely to find the statement reinforcing therefore the desired behavior is likely to reoccur (Lane et al., 2015). Behavior specific praise has been used to increase appropriate behaviors for students with

disabilities (Lewis et al., 2004). Rathel et al. (2014) demonstrated an increase in engagement with the use of BSP in special education classrooms. Behavior specific praise has also been used to increase on-task behavior (Sutherland et al., 2002) and decrease disruptive behaviors (Dufrene et al., 2014). Furthermore, Donehower and colleagues (2020) found that giving students positive feedback was one of the top ten skills for effective teachers to possess and appropriate to target using simulation.

Token Reward System (TRS)

Another behavior management technique that can be implemented by teachers in the classroom is a token reward system (TRS). Although TRS requires more preparation than OTR and BSP, it is still a relatively simple behavior management strategy for teachers to implement. The preparation for teachers involves creating the tokens that will be delivered and acquiring individualized reinforcers that the student can access when they earn tokens. Token reward systems emphasize the use of positive reinforcement to target behavior change by helping students visualize progress, work for delayed reinforcement, learn to self-monitor, and learn to regulate behavior (Stainbrook et al., 2015). When a TRS is in place, the student earns tokens directly from the teacher for demonstrating a desired behavior (Alberto & Troutman, 2017), then the student is provided the opportunity to use those tokens to purchase reinforcers specific to their interests (Soares et al., 2016). Token reward systems have been used to increase desired behaviors and decrease challenging behaviors of students with disabilities (Carnett et al., 2014; Hackenberg, 2009; Klimas & McLaughlin, 2007; Matson & Boisjoli, 2009).

Teacher Candidate Training for Classroom Management

Pre-service teachers of students with ASD require a deep understanding of the unique behavioral challenges that many students with ASD experience and the teaching strategies required to support those needs (Scheuermann, 2003). Unfortunately, many teacher candidates do not receive formal preparation to effectively manage challenging behaviors in their classrooms (Freeman et al., 2014). Teachers report that they learned how to deal with “most” challenging behaviors but did not perceive their professional preparation to be adequate to successfully intervene on all challenging behaviors (Westling, 2009). Without acceptable classroom management training as part of teacher preparation programs, new teachers

may use ineffective methods of behavior management which can lead to reduced job satisfaction (Brunsting et al., 2014). Often times, teacher candidates' only opportunity to apply behavior management strategies is in the one or two practicum experiences and a student teaching placement, which may not be enough to acquire and master these skills (Mamlin, 2012). Pre-service teachers of students with ASD require and deserve the opportunity to apply behavior management skills in a training environment that is safe and allows for supportive performance feedback before attempting to apply these strategies in a classroom or on the job for the first time.

Using Mixed Reality for Teacher Development

Mixed reality environments could provide the opportunity for teacher candidates to apply their behavior management skills prior to stepping into a classroom setting. Mixed reality is a medium in which real and synthetic content are blended (Hughes et al., 2005). This technology allows teacher candidates to practice applying evidence-based practices in specially designed classroom scenarios that include customizable avatar students. More specifically, TeachLivE^{TM}(TLE), a mixed-reality classroom environment allows for the development of teachers' classroom management and instructional skills (ITLL, 2019). TLE utilizes virtual puppetry that targets the performance of preservice and in-service teachers (Dieker et al., 2014). This program was created at the University of Central Florida in 2005 through a collaborative effort to explore the use of blended human and avatar interactions on the development of teacher practice (Dieker et al., 2014). TLE is different from other simulation programs because it is synchronous, meaning interactors are combined with technology and artificial intelligence to provide a unique interactive experience. The fact that there are human interactors in every session allows the avatar students to behave and react to the teacher just as real-life students would respond in a real-life classroom (Dieker et al., 2014).

TLE can provide participants with an opportunity to practice teaching skills with no adverse effect on real students for poor performance (Dieker et al., 2014). Ersozlu and colleagues' (2021) analysis of the current research on TLE highlighted that using this technology with in-service teachers in school-

based contexts is beginning to emerge as a new area of interest. Ersozlu and colleagues' results also demonstrate how technology can move from simply being used "in the classroom" to actually serving "as the classroom." For example, Kelly and Wenzel (2019) used TLE to improve teacher candidates' parent conferencing skills by allowing the participants to conduct practice parent-teacher conferences and receive observational feedback. Vince and colleagues (2016) used individualized clinical coaching in the TLE rehearsal environment to successfully increase teachers' fidelity in implementing a system of least-to-most prompts. Judge and colleagues (2013) used TLE to investigate teacher candidates' use of behavior management skills. The results demonstrated that a majority of the teacher candidate participants were able to increase the use of the behavior management strategies. Peterson-Ahmad (2018), used TeachLivE to train teachers in providing OTRs in the simulator classroom. The mixed results of this study resulted in an increase in 50% (n = 4) of the participants' rate of OTR per minute. Another study used TLE combined with professional development and coaching to train special education teachers in classroom management skills, which resulted in a decrease in challenging behaviors among students with ASD (Pas et al., 2016). It is also important to note that generalization is often left out of research surrounding the use of simulation technology to train teachers in classroom management skills. Dawson & Lignugaris/Kraft (2017) used a weekly generalization measure to track participants use of BSP and other skills into their classroom following simulation training sessions. Other studies to include a generalization measure of classroom management skills trained using simulation technology were Pas et al., (2016) and Shernoff et al., (2021).

Statement of Purpose

The purpose of this study is to explore the impact that a training package (i.e., didactic training plus TLE rehearsal sessions) has on pre-service teachers' implementation of three classroom management skills. The following research questions will be addressed by this study:

1. To what extent does didactic training plus TLE rehearsal sessions increase the teacher implementation performance for three behavior management strategies (i.e., OTRs, BSP, and TRS) in teacher candidates working with students with ASD in the classroom?

2. To what extent do teacher candidates find the goals, procedures, and outcomes of using TLE as a training component for behavior management skills socially important and acceptable?

Methods

Participants

Following IRB approval, participants for this study were recruited through their student teaching placement assignments with Georgia State University. Four student teacher candidates consented to participating in the study (see Appendix A) because their placements were in elementary school classrooms that served students with ASD. Student teachers completing their placement in other settings did not meet the inclusion criteria for this study. At the start of the study, the participants were providing a low rate (less than 2.0 per minute) of opportunities to respond. BSP and TRS are connected to OTRs therefore the inclusion criteria are based on the participant performance of OTR. Participants were excluded in this study if they were already implementing a token reward system unless they were implementing with low fidelity (50% or less tokens appropriately delivered) and accuracy (40% or less of the trained TRS steps performed correctly). All four participants were serving as the teacher of record for their classroom under a provisional license.

Ryder was a 37-year-old female majoring in Special Education - Adapted Curriculum who was completing her final student teaching placement. Her highest level of education was a bachelor's degree. This was her first year as the teacher of record for her ASD self-contained classroom for 3rd through 5th grade students. Prior to being teacher of record, she served as a paraprofessional in the same classroom for three years, a paraprofessional in a K to 5th moderate/severe self-contained classroom for two years, and an RBT at an ABA clinic for one year. On a pre-study questionnaire, she reported that her previous classroom management training experience included online modules and an intro to ABA course through the university.

Cindy was a 51-year-old female receiving her teaching certificate in Special Education - General Curriculum. Her highest level of education was a master's degree of education. She reported that she has been teaching for over two years. Previously, she taught middle school English language arts to 6th and 7th

graders in general education. She reported that her classroom management training experience included an introduction to ABA course through the university as well as behavior management training from an autism specialist through her school district.

Mary was a 55-year-old female receiving her Master of Arts in Teaching (MAT) in Special Education. Her highest level of education was a Master of Science in Public Health. At the time of the study, she was serving as the teacher of record for her ASD level 3 classroom for 4th and 5th graders. Prior to serving as the teacher of record, she served as a professional in a Moderate Intellectual Disabilities (MOID) classroom for 3rd to 5th grade students. Her previous classroom management training experience included a classroom management course with the university and best practices course for students in low incidence programs through her school district.

Brookelynn was a 25-year-old female who was working on her MAT in Special Education - General Curriculum. Her highest level of education was a bachelor's degree. For this study, she was serving her first year as the teacher of record for a 3rd and 4th grade ASD level three classroom which is a self-contained classroom serving students who have a diagnosis of a mild/moderate level of ASD. Prior to this position, she had experience working previously in an ABA clinic. Her previous classroom management experience also included courses taken as part of her university program.

Setting

This study had multiple settings including the training environment and classroom environments. The didactic training sessions occurred via WebEx, a virtual meeting platform provided to students and faculty at Georgia State University. The TLE sessions were conducted via Zoom in the Interactive Teaching and Learning Lab (ITLL) at Georgia State University. An "interactor" from the University of Central Florida played the role of the elementary school students and was connected to the session via zoom. The interactor was provided with a scenario so that they could interact in a way to maximize practice opportunities for the participants. The behaviors of the students occurred in real time although a few behaviors were preplanned and could be triggered automatically. All data collection for baseline and post intervention sessions took place in the participants' assigned classrooms during the same small group

lesson at the same time every day for each observation. During these sessions, the participants were providing instruction to a small group (2-5) of students. These observations were completed virtually via WebEx.

Materials

The training package included a didactic presentation, technology in the form of simulated practice sessions, and performance feedback/coaching. The format for this training package was based on the suggestions of Marelle & Donehower Paul (2022).

TeachLivE^{TM}

Figure 2.1

TeachLivE^{TM} Classroom

TLE is a mixed-reality teaching environment that allows the student avatars' behavior and interactions to be controlled and customizable. Participants can rehearse behavior management skills with a virtual classroom of students and then receive direct coaching and feedback from a supervisor. By participating in two back-to-back rehearsal attempts, the participants in this study were able to promptly implement the feedback from the supervisor. Figure 1 shows the seating chart for an elementary school TLE session and the view that the participants had when they entered the virtual classroom.

Didactic Presentation

A PowerPoint presentation was reviewed during each didactic training session for a total of three different presentations (i.e., OTRs, BSP, TRS). The PowerPoints included direct instruction of the rationale and implementation procedures, modeling with examples and non-examples, practice opportunities to identify examples and non-examples, a post training assessment, and feedback. If the participant was unable to appropriately answer the post training assessment, then the didactic presentation was repeated and then assessed again. An electronic copy of each presentation was provided to each participant.

Token Reward System Materials

Materials for the TRS included multicolored "dollars" that were delivered as tokens. The students were not limited in the number of "dollars" they could earn therefore the students were expected to be provided with a "dollar" for every appropriate response. As part of the TRS, the students used their earned "dollars" to purchase items from the "market." The participants were provided with enough reward items to supply the market for their students. These items were selected based off information gathered about student preferences as recommended by the teacher candidate prior to the study. These items included but are not limited to bubbles, fidgets, pencils, stamps, stickers, etc. The participants were also be provided with labeled boxes to store the "market" items in based on the dollar value for each prize. For example, pencils were worth five dollars so they would be stored in the box labeled "$5."

Research Design

This study used a single case research design. Since the purpose of this study was to examine the effects of a didactic training coupled with TLE rehearsal on teacher performance for three target behaviors, the design of this study was a multiple baseline across behaviors which was replicated across four participants.

Independent Variables

Didactic Training

The didactic training sessions were 15-30 minutes in duration. The participants attended one didactic training session for each of the three targeted classroom management skills (i.e., OTRs, BSP, TRS). The didactic training sessions always occurred immediately before the TLE rehearsal sessions. Each didactic session was conducted via WebEx and included a PowerPoint as described above.

TeachLive™ Rehearsal Sessions

Following each didactic training session, the participants completed a TLE rehearsal session. The sessions included two 10-minute practice attempts in the TLE simulator. Each session started off with a 5-minute introduction to give the participant a chance to acclimate to the simulator. Then the participant completed the first of the two rehearsal attempts while the PI recorded data on implementation performance. In the rehearsal session, the participant taught a short lesson using a children's book of their choice. The same book could be used across all rehearsal sessions. Following the first 10-minute attempt, the participant received 5 minutes of performance feedback from the PI. This process was repeated for another 10-minute attempt and 5 minutes of feedback. Participants were also provided an opportunity to ask any further questions before the end of the session.

Dependent Variables

Opportunities to Respond

A single OTR occurred when a teacher participant presented an inquiry (e.g., asking a question) or provided a direction that required a student to produce an observable action (e.g., a verbal or written response; Simonsen & Myers, 2015). For the purpose of this study, an OTR is any occurrence of the teacher providing an opportunity to respond either verbally, written, or physically to a question or the delivery of a direction. This does not include any follow-up prompts that a teacher would provide for student who is a not responding. An appropriate example of a single OTR consisted of a teacher asking a student to answer a question independently or as part of a small group. If the student or students did not

respond and the teacher used a follow-up response prompt as the first OTR that would be counted as one OTR. For example, the teacher asks a student to name a character in the story and, when the student does not respond, she then asks the student to tell her one person in the story or uses a gestural prompt by pointing a character in the story. This exchange would be counted as one OTR. Conversely, if the teacher modifies the original OTR in the follow-up prompt by expecting a different and unique response then this would be counted as two separate OTRs. For example, the teacher asks the student to name a character in the story and the student does initially respond, so the teacher asks the student to give the title of the story. A single OTR included a request for a verbal response, gesture, choral response, or physical response appropriate to the OTR or direction. Participants were told to target 2.0 to 5.0 OTRs per minute. This criterion will be included in the didactic training but if participants are outside of the criteria of OTRs per minute during the rehearsal then feedback and coaching will be provided and will redo the rehearsal session.

Behavior Specific Praise

Behavior specific praise (BSP) was defined as any occurrence of the teacher providing a student or group of students with positive, verbal feedback that is specific to a display of appropriate behavior. The appropriate delivery of BSP was tracked as well as any missed opportunities or errors. An example of appropriate delivery of BSP was if a student responds to a question by raising their hand and answering when called upon, the teacher could use BSP by saying “Great job raising your hand to answer the question!” Missed opportunities or errors included the absence of a praise statement or delivery of a general praise statement. For example, a teacher asked a question, a student responded after being called upon, and the teacher replied with only “That’s right!”. Behavior specific praise did not have to be connected to an OTR and was counted as appropriately delivered if it used freely during data collection. For example, the teacher said “Group, I love how you all are sitting quietly!”, counts as a single occurrence of BSP.

Token Reward System

A token reward system (TRS) is defined as the teacher responding to an appropriate behavior by delivering a token within five seconds of the student engaging in that behavior. Token reward system was tracked by appropriate delivery and missed opportunities/errors. One example of appropriate delivery would be if a student responds to a question by raising their hand and waiting to be called on before answering, the participant will deliver a token by handing it to him or her or placing it on the table in front of them. On the contrary, a missed opportunity/error would be anytime the participant fails to deliver a token for a desired behavior, delivers a token for no reason, or removes a token. A missed opportunity/error would be if the teacher provides the token for a non-target behavior, or the participant does not deliver a token when a desired behavior was displayed. The delivery of a token did not have to be related to a BSP statement to be counted as appropriately delivered. A token could also be delivered freely for any appropriate behavior as the teacher deemed necessary.

Data Analysis

Data were collected across all conditions (baseline, rehearsal, and intervention) for every target behavior. Data for OTR was collected by completing a frequency count and then converting it to rate per minute. For BSP and TRS, data were collected for both appropriate delivery and missed opportunities/errors. Therefore, data were collected for appropriate BSP, missed/ error BSP, appropriate TRS, and missed/ error TRS. The data for BSP and TRS was collected as a frequency count during each session and converted into rate per minute.

Social Validity

Social validity data were collected by two methods. First, the Treatment Acceptability Rating Form-Revised (TARF-R; Reimers & Wacker, 1988) was completed by all participants at the end of the study. Second, a sustained use social validity measure was conducted two weeks after the wrap up of the intervention data collection. The PI observed the participants in the same setting and used the same data collection methods to assess whether participants were still implementing the target behavior management skills.

Generalization

Following the final training session, the participants were observed in a setting different from the original small group data collection setting using the same data sheets. This new setting could include a whole group lesson, small group lesson on a different subject, or a lesson being taught to other students not included in the data collection small group. During this observation, the PI used the same data collection methods. This provided the PI with data regarding the generalization of the behavior management skills.

Reliability

Fidelity of Intervention. The fidelity of intervention for both the didactic training and TLE rehearsal sessions were tracked via an implementation rubric. The rubric was completed by a secondary data collector for one-third of the training sessions. A fidelity checklist for the performance feedback provided following each rehearsal session was also used. The secondary data collector was trained using a training developed using the BST format which included direct instruction, modeling, practice, and feedback. Acceptable fidelity per session is 90% or higher. Procedural fidelity was 99% across all four training sessions.

Inter Observer Agreement. A secondary data collector was trained to collect interobserver agreement (IOA) data prior to the start of the study. The training was designed using the BST format which included direct instruction on the operational definitions of each dependent variable, modeling of data collection, data collection practice, and performance feedback. The data collector then scored 36% (n = 28) of the baseline and intervention data collection sessions. Interobserver agreement (IOA) was calculated by dividing agreements by agreements plus disagreements then multiplying by 100 to convert to percentage. Acceptable IOA per session is 90% overall and 85% per behavior. For session 12 for Ryder, the IOA for OTRs scored 82%, which was below the 85% threshold therefore the data collectors conducted a meeting to discuss discrepancies. In total IOA was XX%.

Visual Analysis

Visual analysis was used to determine the appropriate time to change from the baseline condition to the training intervention for each participant across the behaviors. The visual analysis included an

assessment of level, trend, variability, and immediacy of effect between conditions to determine if the intervention training caused an increase or decrease in the level and trend of the data. To meet the standard for What Works Clearinghouse (WWC), a multiple baseline design must have a minimum of six phases with at least five data points per phase.

Effect Size

An effect size was calculated using the Tau-U which combines non-overlap between phases with intervention phase trend and can correct for a baseline trend (Parker et al., 2011). The Tau-U was calculated using an online calculator for single case design research (Vannest et al., 2016).

Results

Figure 2.2

Teacher Performance Across Behaviors

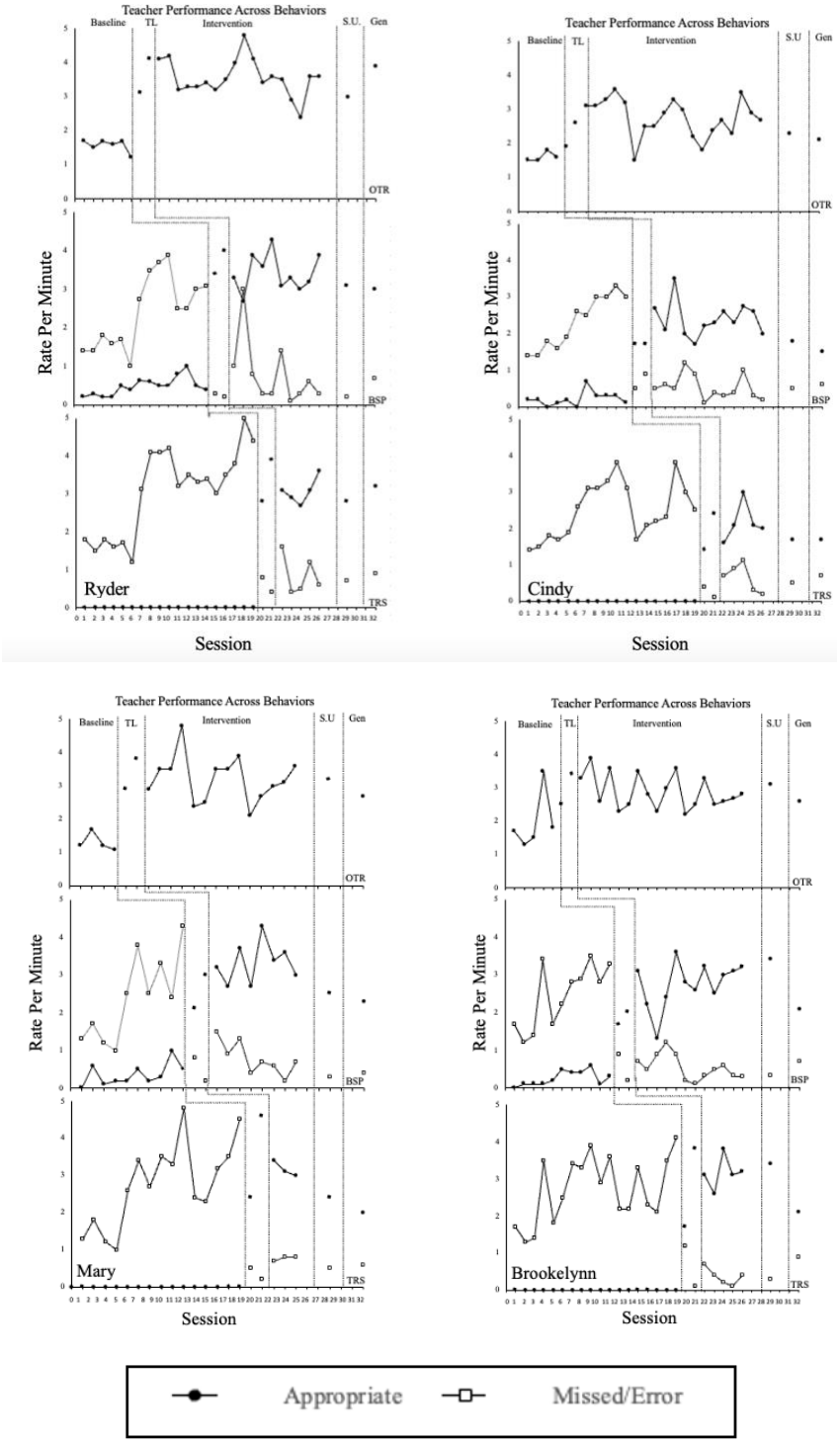


Figure 1 displays the results of each teacher participant's performance across behaviors. For each graph, the x-axis represents the session number, and the y-axis represents the rate per minute. The top graph is the rate of opportunities to respond, the middle graph is behavior specific praise, and the bottom graph is implementation of the token reward system. For BSP and TRS, the closed circles represent appropriate delivery, and the open squares represent missed opportunities or errors.

Ryder

For OTRs, Ryder provided a median of 1.65 OTRs (range 1.2 – 1.7) per minute in baseline. The OTR baseline data were stable with a narrow range that spanned less than 0.5 OTRs per minute across sessions. During training for OTRs, she delivered 3.13 and 4.1 OTRs per minute. Following training, she delivered a median of 3.5 (range 2.4 – 4.8) OTRs per minute. There was an abrupt increase in level from baseline to the post training condition for OTRs. It is important to note that Ryder was able to provide 3.4 and 4.0 OTRs during the second training session in the simulator (session 11 and 12) and 3.4 and 3.6 during the third training session (session 20 and 21). A positive effect size of 1 was calculated for OTR.

Baseline for BSP was variable for missed opportunities and showed a high level of missed opportunities/errors. Baseline for BSP appropriate deliveries were relatively stable and at a low level. In baseline, she appropriately delivered a median of 0.5 BSP statements (range 0.2 – 1.0) per minute and missed or delivered in error a median of 2.5 (range 1.0 – 3.9) BSP statements per minute. During the second two training simulation session which was specifically dedicated to BSP she appropriately delivered 3.4 and 4.0 BSP statements per minute and missed or delivered in error 0.3 and 0.2 BSP statements per minute. Following the training sessions, the participant was able to deliver a median of 3.3 (range 2.7 – 4.3) BSP statements appropriately and missed or delivered in error a median of 0.45 (range 0.1 – 3.0) BSP statements. During the third simulation training session, she appropriately delivered 3.6 and 4.3 BSP statements and missed or delivered in error 0.3 BSP statements per minute for both sessions. The level for BSP appropriately delivered increased while the level for missed opportunities or errors decreased. The trends in the data collected after the BSP training session were more variable with missed opportunities happening more than appropriate deliveries in session 18. For appropriately delivered BSP

the effect size was 0.7 and for missed opportunities or BSP statements delivered in error the effect size was 1.

The level for missed opportunities for token delivery was high in baseline and the level for appropriate delivery was low. More specifically, in baseline, Ryder was able to appropriately deliver 0 tokens across all sessions and missed or delivered in error a median of 3.13 tokens (range 1.2 – 5.0). During the final training session, which was specific to TRS, Ryder was able to appropriately deliver 2.8 and 3.9 (sessions 20 and 21) and missed or delivered in error 0.8 and 0.4 tokens. Following the final training session, there was an abrupt change in level with Ryder appropriately delivering a median of 3.1 (range 2.7 – 3.6) and missed or delivering in error a median of 0.6 (range 0.4 – 1.6) tokens. The level of tokens delivered appropriately increased from baseline to post training and stayed relatively stable during post training. The level for missed opportunities or tokens delivered in error decreased from baseline and remained relatively stable post training. The effect size for both TRS delivered appropriately and missed/error was 1.

Cindy

In baseline for OTRs, Cindy provided a median of 1.55 (range 1.5 – 1.8) per minute. The OTR baseline data were stable with a narrow range that spanned less than 0.3 OTRs per minute across sessions. During training she delivered 1.9 and 2.6 OTRs per minute. There was an abrupt increase in the level of OTRs provided per session following the training sessions. Cindy delivered a median of 2.9 (1.5 – 3.6) per minute. The calculated effect size for OTRs for Cindy was 0.87.

There was a high level of missed opportunities or errors of BSP in baseline with an increasing trend while the level of appropriately delivered BSP statements was at a relatively stable and low level. In baseline for BSP, she appropriately delivered a median of 0.2 (range 0 – 0.7) BSP statements per minute and missed or delivered in error a median of 2.55 (range 1.4 – 3.3). During both training practice opportunities for BSP, she appropriately delivered 1.7 BSP statements per minute and missed or delivered in error 0.5 and 0.9 BSP statements per minute. There was an abrupt change in the level following the BSP training session. Appropriately delivered BSP statements increased while the level for missed

opportunities decreased. Cindy was able to appropriately deliver a median of 2.3 (range 1.7 – 3.5) BSP statements per minute and missed or delivered in error a median of .45 (range 0.2 – 1.2) following the training sessions. The calculated effect size for appropriately delivered BSP statements for Cindy was 0.92 and for missed opportunities or errors was 1.

The appropriate delivery of tokens was at a low level and stable trend for baseline and the missed opportunities for errors was at a high level and variable trend. For the baseline condition in TRS, Cindy deliver 0 tokens appropriately and missed or delivered a median of 2.4 (range 1.4 – 3.8) tokens in error. During the TRS training sessions, Cindy was able to deliver 1.4 and 2.4 tokens appropriately and missed or deliver in error 0.4 and 0.1 tokens. Following the training, the level for missed opportunities decreased and the level for appropriately delivered increased. She was able to appropriately deliver a median of 2.4 (range1.6 – 3.0) tokens in the post training condition and missed or delivered in error a median of 0.7 (range 0.2 – 1.13). The calculated effect size for TRS appropriately delivered and missed opportunities or error was 1.

Mary

In baseline for OTRs, Mary provided a median of 1.2 (range 1.1 – 1.7) per minute. The OTR baseline data were stable with a narrow range that spanned less than 0.6 OTRs per minute across sessions. During training she provided 2.9 and 3.8 OTRs per minute. There was an abrupt change in level following the training session. The level of OTRs increased to a median of 3.3 (range 2.1 – 4.8). The calculated effect size was 1.

For BSP, the level of missed opportunities or statements delivered in error was high and on an increasing trend during baseline while the appropriate delivered statements were low and stable in baseline. She appropriately delivered a median of 0.25 (range 0 – 1.0) BSP statements per minute and missed or delivered in error a median of 2.5 (range 1.0 – 4.3) BSP per minute. During the training sessions, Mary was able to appropriately deliver 2.1 and 3.0 BSP statements and missed or delivered in error 0.8 and 0.2 BSP statements per minute. Following the training sessions, the level of appropriately delivered statements increased while the missed opportunities level decreased. Mary was able to

appropriately deliver a median of 3.3 (range 2.7 – 4.3) statements and missed or delivered in error a median of 0.7 (range 0.4 – 1.5) statements per minute. The calculated effect size was 0.74 for appropriately delivered BSP and 1 for missed opportunities or errors.

In baseline for TRS, Mary did not deliver any tokens appropriately and missed or delivered in error a median of 2.7 (range 1.0 – 4.5) tokens. Missed opportunities or tokens delivered in error was on an increasing trend in baseline. During the TRS training sessions, she was able to deliver 2.4 and 4.6 tokens appropriately and missed or delivered 0.5 and 0.2 tokens in error. Following the training sessions, Mary, was able to appropriately deliver a median of 3.1 (range 3.0 – 3.4) tokens and missed or delivered a median of 0.8 (range 0.7 – 0.8) tokens per minute which was an abrupt change in level. The calculated effect size for appropriately delivered tokens and missed opportunities or errors was 1.

Brookelynn

In baseline, Brookelynn provided a median of 1.7 OTRs (range 1.3 – 3.5) per minute. During the two training sessions, she provided 2.5 and 3.4 OTRs per minute. The trend during baseline was variable but the level demonstrated an immediate increase from baseline to the post training condition. Following the intervention, she was able to provide a median of 2.75 OTRs (range 2.2 – 3.9) per minute. The calculated effect size for OTRs was 0.63.

In baseline, she appropriately delivered a median of 0.2 BSP statements (range 0 – 0.6) per minute and missed or delivered in error a median of 2.8 (range 1.2 – 3.4) BSP statements per minute during baseline. The level for appropriately delivered BSP statements increased from baseline to post training while the missed opportunities and errors decreased. During the training sessions she appropriately delivered 1.7 and 2.0 BSP statements per minute and missed or delivered in error 0.9 and 0.2 BSP statements per minute. Following the training sessions, the levels abruptly changed, she appropriately delivered a median of 2.9 (range 1.3 – 3.6) BSP statements and missed or delivered in error a median of 0.5 (range 0.1 – 1.2). The calculated effect size was 0.8 for appropriately delivered BSP and 1 for missed opportunities or errors.

During baseline for TRS, she appropriately delivered 0 tokens and missed or delivered in error a median of 2.7 (range 1.3 – 4.1) tokens. In the final training sessions, she was able to appropriately deliver 1.7 and 3.8 tokens per minute and missed or delivered 1.2 and 0.1 tokens in error. The level of appropriately delivered tokens increased following the training sessions while the missed opportunities or errors decreased. Following the training sessions, she was able to appropriately deliver a median of 3.1 (range 2.6 –3.8) tokens and missed or delivered in error a median of 0.4 (range 0.1 – 0.7). The calculated effect size was 1 for both appropriately delivered and missed opportunities or errors for TRS.

Overall, the effect size was calculated separately for all trained behaviors across participants including appropriately delivered skills and missed opportunities. This effect size was also corrected for baseline trend. For OTRs the calculated effect size was 0.89. The calculated effect size for appropriately delivered BSP was 0.79 and missed opportunities or errors was 1. The calculated effect size for appropriately delivered TRS and missed or delivered in error TRS was 1.

Social Validity

The participants completed a social validity questionnaire to assess their perceptions of the effectiveness and impact of the intervention. The participants rated the degree to which they agreed or disagreed with each statement on a 5-point Likert-type scale as described previously. On average, the participants highly rated the acceptability of the intervention, their willingness to participate in the intervention, effectiveness of the intervention, and the fit of the goals of the intervention. Overall, participants scored the social validity measure at an average of 4.47 (range 3.75 – 5). Ryder scored the highest on the social validity measure with an average score of 4.87 (range 4 – 5). Brookelynn had the next highest social validity score with an average of 4.67 (range 4 – 5) across all fifteen questions. Cindy and Mary had the two lowest social validity scores of the four participants. Cindy scored an average of 4.27 (range 2 – 5) and Mary scored an average of 4.07 (range 3 – 5).

All four participants rated their willingness to participate in the TLE training package at a 5 which was the highest rating option. On average, the participants rated their acceptability of taking part in practice session in the TLE simulator and their confidence that the simulator was effective for their

teaching career at a 4.75 (range 4 – 5). The participants also rated the fit of the goals of the intervention relating to their teaching practice at a 4.75 (range 4 – 5). Regarding their participation resulting in permanent improvements in their classroom management skills, the participants rated a 4.5 (range 4 – 5). Furthermore, the participants rated the fit of the classroom management skills into their daily classroom routine and how much they liked the TLE intervention as a 4.5 (range 4 – 5). When asked about how willing the participants would be to continue the classroom management skills in their classroom, the participants on average said a 4.25 (range 3 – 5). Finally, the participants scored a 4 (range 3 – 5) for how willing they would be to participate in a TLE intervention again.

All four participants rated the amount of discomfort their students experienced during this intervention as a 5 which was the lowest amount of discomfort. The participants scored a 4.75 (range 4 – 5) on the extent of undesirable effects they felt by participating in the intervention. The amount of disruption the classroom management skills caused in the classroom was rated a 4.5 on average (range 4 – 5). Finally, the participants scored a 3.75 (range 3 – 4) for any disadvantages to the TLE intervention and how much time was needed to carry out the classroom management skills.

It is interesting to note a few outliers on the TARF-R social validity measure. Cindy rated the amount of time that was required each day to carry out the classroom management skills at a 2 meaning she marked that significantly more time was needed when the other participants scored a 4 or 5. Cindy also marked the effectiveness of the intervention as a 3. Mary rated the disadvantages of the TeachLivE intervention as a 3 which was lower than the other three participants who marked it as a 4. Mary also rated how willing she was to carry out the classroom management skills as a 3 which was lower than the other participants who scored this question as a 4 or 5. Brookelynn and Mary both rated how willing they would be to participate in an intervention using TeachLivE again as a 3 while Ryder and Cindy marked this one as a 5.

Two weeks after the final data collection session, a sustained use measure was taken by the primary investigator. The PI conducted a brief 10-minute observation in the classroom at a scheduled time that was different than the lesson time that was used during the daily data collection sessions. All four

participants were still implementing the classroom management skills. Ryder demonstrated a rate of 3.0 OTRs, 3.1 appropriate BSP statements, 0.2 missed BSP statements, 2.8 tokens delivered appropriately, and 0.7 missed tokens per minute. Cindy demonstrated a rate of 2.3 OTRs, 1.8 appropriate BSP statements, 0.5 missed BSP statements, 1.7 tokens delivered appropriately, and 0.5 missed tokens per minute. Mary demonstrated a rate of 3.2 OTRs, 2.5 appropriate BSP statements, 0.3 missed BSP statements, 2.4 tokens delivered appropriately, and 0.5 missed tokens per minute. Brookelynn demonstrated a rate of 3.1 OTRs, 3.4 appropriate BSP statements, 0.3 missed BSP statements, 3.4 tokens delivered appropriately, and 0.3 missed tokens per minute.

Generalization

Two weeks following the data collection sessions, each participant was observed in person during a lesson different from the original lesson or environment from the original observations. Ryder demonstrated a rate of 3.9 OTRs, 3.0 appropriate BSP statements, 0.7 missed BSP statements, 3.2 tokens delivered appropriately, and 0.9 missed tokens per minute. Cindy demonstrated a rate of 2.1 OTRs, 1.5 appropriate BSP statements, 0.6 missed BSP statements, 1.7 tokens delivered appropriately, and 0.7 missed tokens per minute. Mary demonstrated a rate of 2.7 OTRs, 2.3 appropriate BSP statements, 0.4 missed BSP statements, 2.0 tokens delivered appropriately, and 0.6 missed tokens per minute. Brookelynn demonstrated a rate of 2.6 OTRs, 2.1 appropriate BSP statements, 0.7 missed BSP statements, 2.1 tokens delivered appropriately, and 0.9 missed tokens per minute.

Discussion

The purpose of this study was to examine the effects of using a training package that included simulated practice opportunities using TLE on teacher candidates' implementation of behavior management skills with students with ASD. This study also explored the extent to which the teacher candidates found TLE to be an acceptable and effective part of the training package for behavior management skills. Finally, the study included a measure of the sustained use of the trained skills as another measure of social validity.

Following the initial training for OTRs, results indicated a functional relationship between implementation of the training package and an increase in teacher performance. During baseline, all four participants had low rates of opportunities for students to respond per minute. Following the training, every participant demonstrated an immediate increase in level to a high and relatively stable amount of OTRs. Brookelynn demonstrated the most stable rate of opportunities to respond across sessions with a range that spanned around 1.7. Ryder demonstrated the most variable number of opportunities to respond post training with a range that spanned 2.4.

During the baseline sessions, all participants demonstrated a low level of BSP statements. Following the training sessions, all participants demonstrated an immediate increase in level for appropriately delivered BSP statements. In session 18, Ryder demonstrated a slight decrease in appropriately delivered BSP statements which results in the instability of the post training data. Cindy demonstrated the most variable level for BSP appropriately delivered post training with a range that spanned 1.8.

Overall, the participants provided reasonably positive feedback regarding their participation in the TLE training package. The sustained use measure noted as S.U. in Figure 1, show that all participants continued to implement the three classroom management skills that they were trained to use at the two-week follow-up observation. Regarding the generalization measure taken at a separate two-week follow-up observation conducted in person, all participants were implementing the trained classroom management skills in other areas of their teaching. For example, Ryder was implementing the classroom management skills in a small group science lesson. Cindy and Brookelynn were using the classroom management skills during a whole group math lesson. Finally, Mary was implementing the classroom management skills with her 4th grade students, who were not her target students during typical observations, during a small group health lesson. The results of these measurements demonstrate an acceptability of the training procedures used in the intervention package.

Limitations

There are various limitations to this study. In general, the observation sessions were ten minutes in length although some unexpected circumstances and/or technical issues prohibited all sessions from being ten minutes. For example, session 3 for Cindy only lasted eight minutes because of internet connection was dropped and session 22 was cut short to only nine minutes by an unexpected fire drill. Session 7 for Ryder was cut to only eight minutes due to internet connection issues. Finally, session 7 for Mary started late due to technical issues.

Another limitation to this study is that participants were not required to teach a specific lesson and were given flexibility to teach a content of their choice as long as it was small group. For example, in session four, Brookelynn taught a scripted guided reading lesson instead of her typical math review lesson, therefore, she provided a high rate of OTRs. In session seven, Mary incorporated a video into her typical math instruction which left her with little time to provide a consistent amount of OTRs.

Relying on student engagement is another limitation of this project. In some sessions, participants had to spend a lot of time prompting students who were refusing to engage in lessons or displaying challenging behavior. As described in the OTR operational definition, continual prompts do not count as individual OTRs, therefore the number of OTRs would significantly dip for that session. For example, in session 14 and 15 for Mary, her students were requiring a lot of prompting to stay on task and engaged with the lesson, therefore her OTRs were lower.

Another limitation is the instability of data in baseline. It can be inferred that the instability of data for BSP delivered in error/ missed and TRS missed or delivered in error resulted from the training of OTRs. Once the OTR training was completed the data shows an abrupt increase in missed opportunities/ errors for both BSP and TRS. This abrupt increase can be credited to the number of opportunities to implement those skills appropriately automatically increases when the OTRs increases per session. Since the participants had not been trained in BSP or TRS, there was a higher rate of missed opportunities and errors for both skills.

A final limitation to this study was scheduling of training sessions. Because this study included participants who were students and teachers of record, scheduling sessions was challenging. TLE training

sessions had to be scheduled in advanced and therefore could not be scheduled based on participant performance. Although the schedule was originally built with at least five data collection sessions for each condition, due to participant cancellations that was not able to happen consistently. For example, Ryder only completed three observation sessions following the second training which was on behavior specific praise even with slight variation in trend leading up to the third training.

A few other limitations to consider of this project are the fact that lesson plans were not regulated. The participants were given the freedom to choose any ten-minute small group lesson they wanted to teach. Often, the lesson was a quick review of previously learned math materials, leveled reading, or community skills activities. It also should be considered that the participants were not afforded an opportunity to explore the simulator prior to the first training session. Participating in the simulator is novel and often participants are apprehensive upon starting the first session therefore the data could reflect this limitation.

Implications for Practice

The results of this study highlight several implications for practice. First, providing teacher candidates with simulated practice opportunities where they can receive direct feedback on behavior management skills is an effective training method. Second, because this study was done virtually, this training package could be implemented across the country which could provide school districts with the opportunity to receive training, practice opportunities, and direct performance feedback by experts in the field. By implementing TLE in teacher training packages, teachers are able to practice behavior management skills from their own home and receive performance feedback that they typically would not have access to.

Future Research

The potential impact of using TLE to train teacher candidates has been highlighted by this study. Future research should consider adding follow-up feedback either via email or text messages following daily observations. It would be interesting to examine the impact of providing the participants with the rates per minute related to each skill following every observation and then fading that support for a

sustained measure. Similarly, examining the effect of providing the participants with an opportunity to participate in a self-reflection or monitoring activity following each classroom observation. Future research should also explore implementing a more frequent social validity measure to give participants the opportunity to express their comfort level as well as provide the PI with any feedback needed to adjust the training sessions. Finally, it would be interesting to also track behavior data on the students that are present during the small group. This study examined only the implementation of the teacher, but it would be even more impactful to be able to show the impact of the combination of trained skills (OTR, BSP, and TRS) on student behavior as well.

References

Alberto, P., & Troutman, A. C. (1982). *Applied Behavior Analysis for teachers: Influencing student performance*. C.E. Merrill.

Aronson, J., Zimmerman, J., & Carlos, L. (1999). *Improving student achievement by extending school is it just a matter of time?* Distributed by ERIC Clearinghouse.

Brownell, M. T., Bettini, E., Pua, D., Peyton, D., & Benedict, A. E. (2018). Special education teacher effectiveness in an ERA of reduced federal mandates and increasing teacher shortages. *Handbook of Leadership and Administration for Special Education*, 333–352. https://doi.org/10.4324/9781315226378-20

Brunsting, N. C., Sreckovic, M. A., & Lane, K. L. (2014). Special education teacher burnout: A synthesis of research from 1979 to 2013. *Education and Treatment of Children*, *37*(4), 681–711. https://doi.org/10.1353/etc.2014.0032

Carnett, A., Raulston, T., Lang, R., Tostanoski, A., Lee, A., Sigafoos, J., & Machalicek, W. (2014). Effects of a perseverative interest-based token economy on challenging and on-task behavior in a child with autism. *Journal of Behavioral Education*, *23*(3), 368–377. https://doi.org/10.1007/s10864-014-9195-7

Centers for Disease Control and Prevention. (2020a). What is autism spectrum disorder? Centers for Disease Control and Prevention. Retrieved December 7, 2021, from https://www.cdc.gov/ncbddd/autism/facts.html.

Centers for Disease Control and Prevention. (2020b). Data & statistics on autism spectrum disorder. Centers for Disease Control and Prevention. Retrieved December 7, 2021, from https://www.cdc.gov/ncbddd/autism/data.html.

Cowan, J., Goldhaber, D., Hayes, K., & Theobald, R. (2016). Missing elements in the discussion of teacher shortages. *Educational Researcher*, *45*(8), 460–462. https://doi.org/10.3102/0013189x16679145

Dawson M. R., Lignugaris/Kraft B. (2017). Meaningful practice: Generalizing foundation teaching skills from TLE TeachLivE to the classroom. *Teacher Education and Special Education*, 40, 26–50.

Dieker, L. A., Rodriguez, J. A., Lignugaris/Kraft, B., Hynes, M. C., & Hughes, C. E. (2014). The potential of simulated environments in teacher education. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *37*(1), 21–33. https://doi.org/10.1177/0888406413512683

Donehower Paul, C., Bukaty, C. A., & Dieker, L. (2020). Teacher professional learning using simulation: A Delphi study. *Teacher Development*, *24*(1), 21–32. https://doi.org/10.1080/13664530.2019.1694574

Dufrene, B. A., Lestremau, L., & Zoder-Martell, K. (2014). Direct behavioral consultation: Effects on teachers' praise and student disruptive behavior. *Psychology in the Schools*, *51*(6), 567–580. https://doi.org/10.1002/pits.21768

Ersozlu, Z., Ledger, S., Ersozlu, A., Mayne, F., & Wildy, H. (2021). Mixed-reality learning environments in teacher education: An analysis of TeachLivE™ research. *SAGE Open*, *11*(3), 215824402110321. https://doi.org/10.1177/21582440211032155

Ferkis, M. A., Belfiore, P. J., & Skinner, C. H. (1997). The effects of response repetitions on sight word acquisition for students with mild disabilities. *Journal of Behavioral Education*, *7*(3), 307–324.

Fitzgerald Leahy, L. R., Miller, F. G., & Schardt, A. A. (2018). Effects of teacher-directed opportunities to respond on student behavioral outcomes: A quantitative synthesis of single-case design research. *Journal of Behavioral Education*, *28*(1), 78–106. https://doi.org/10.1007/s10864-018-9307-x

Freeman, J., Simonsen, B., Briere, D. E., & MacSuga-Gage, A. S. (2014). Pre-service teacher training in classroom management. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *37*(2), 106–120. https://doi.org/10.1177/0888406413507002

Hackenberg, T. D. (2009). Token reinforcement: A review and analysis. *Journal of the Experimental Analysis of Behavior*, *91*(2), 257–286. https://doi.org/10.1901/jeab.2009.91-257

Haydon, T., MacSuga-Gage, A. S., Simonsen, B., & Hawkins, R. (2012). Opportunities to respond: A key component of effective instruction. *Beyond Behavior*, *22*(1), 23–31. https://doi.org/10.1177/107429561202200105

Hughes, C. E., Stapleton, C. B., Hughes, D. E., & Smith, E. M. (2005). Mixed reality in education, entertainment, and training. *IEEE Computer Graphics and Applications*, *25*(6), 24–30. https://doi.org/10.1109/mcg.2005.139

Interactive Teaching and Learning Lab (ITLL). College of Education & Human Development. (2019, August 23). Retrieved December 9, 2021, from https://education.gsu.edu/2019/08/23/interactive-teaching-and-learning-lab-itll/.

Judge, S., Bobzien, J., Maydosz, A., Gear, S., & Katsioloudis, P. (2013). The use of visual-based simulated environments in teacher preparation. *Journal of Education and Training Studies*, *1*(1). https://doi.org/10.11114/jets.v1i1.41

Kelley, M. J., & Wenzel, T. (2019). How TeachLivE™ transformed our teaching practices in reading education and pre-service. *SRATE Journal*, 28(1), 9–22.

Kennedy, C., & Jolivette, K. (2008). The effects of positive verbal reinforcement on the time spent outside the classroom for students with emotional and behavioral disorders in a residential setting. *Behavioral Disorders*, *33*(4), 211–221. https://doi.org/10.1177/019874290803300402

Klimas, A., & McLaughlin, T. F. (2007). The effects of a token economy system to improve social and academic behavior with a rural primary aged child with disabilities. *International Journal of Special Education*, *22*(3), 72–77.

Lane, K. L. (2015). *Supporting behavior for school success: A step-by-step guide to key strategies*. Guilford Press, a Division of Guilford Publications, Inc.

MacSuga-Gage, A. S., & Simonsen, B. (2015). Examining the effects of teacher-directed opportunities to respond on student outcomes: A systematic review of the literature. *Education and Treatment of Children*, *38*(2), 211–239. https://doi.org/10.1353/etc.2015.0009

Mamlin, N. (2012). *Preparing effective special education teachers*. The Guilford Press.

Marelle, C., & Donehower Paul, C. (2022) Four Components for Training Special Education Teachers in Behavior Management Skills. *Journal of Special Education Preparation*, 2(3), 40-47.

Mason-Williams, L., Bettini, E., Peyton, D., Harvey, A., Rosenberg, M., & Sindelar, P. T. (2020). Rethinking shortages in special education: Making good on the promise of an equal opportunity for students with disabilities. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *43*(1), 45–62. https://doi.org/10.1177/0888406419880352

Matson, J. L., & Boisjoli, J. A. (2009). The token economy for children with intellectual disability and/or autism: A Review. *Research in Developmental Disabilities*, *30*(2), 240–248. https://doi.org/10.1016/j.ridd.2008.04.001

McLeskey, J., & Billingsley, B. S. (2008). How does the quality and stability of the teaching force influence the research-to-practice gap? A perspective on the teacher shortage in special education. *Remedial and Special Education*, *29*, 293–305. doi:10.1177/0741932507312010

Munson, J., Dawson, G., Sterling, L., Beauchaine, T., Zhou, A., Koehler, E., Lord, C., Rogers, S., Sigman, M., Estes, A., & Abbott, R. (2008). Evidence for latent classes of IQ in young children with autism spectrum disorder. *American Journal on Mental Retardation*, *113*(6), 439–452. https://doi.org/10.1352/2008.113:439-452

National Center for Education Statistics. (2013). Digest of Education Statistics, 2012 (NCES Publication No. 2014-015). Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics. (2016). *Preparing and credentialing the nation's teachers: The Secretary's 10th report on teacher quality* (U.S. Department of Education, Office of Postsecondary Education). Retrieved from https://title2. ed.gov/Public/TitleIIReport16.pdf

Parker, R. I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining nonoverlap and trend for single-case research: Tau-u. *Behavior Therapy*, *42*(2), 284–299. https://doi.org/10.1016/j.beth.2010.08.006

Pas, E. T., Johnson, S. R., Larson, K. E., Brandenburg, L., Church, R., & Bradshaw, C. P. (2016). Reducing behavior problems among students with autism spectrum disorder: Coaching teachers in a mixed-reality setting. *Journal of Autism and Developmental Disorders*, 46, 3640-3652. https://doi.org/10.1007/s10803-016- 2898-y

Rathel, J. M., Drasgow, E., Brown, W. H., & Marshall, K. J. (2014). Increasing induction-level teachers' positive-to-negative communication ratio and use of behavior-specific praise through e-mailed performance feedback and its effect on students' task engagement. *Journal of Positive Behavior Interventions*, *16*(4), 219–233. https://doi.org/10.1177/1098300713492856

Scheuermann, B., Webber, J., Boutot, E. A., & Goodwin, M. (2003). Problems with personnel preparation in autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *18*(3), 197–206. https://doi.org/10.1177/10883576030180030801

Sciuchett, M. (2019). The development of teacher candidates' self-efficacy for classroom and behavior management across multiple field experiences. *Australian Journal of Teacher Education*, *44*(6), 19–34. https://doi.org/10.14221/ajte.2018v44.6.2

Shernoff, E. S., Frazier, S. L., Maríñez-Lora, A. M., Lakind, D., Atkins, M. S., Jakobsons, L., Hamre, B. K., Bhaumik, D. K., Parker-Katz, M., Neal, J. W., Smylie, M. A., & Patel, D. A. (2016). Expanding the role of school psychologists to support early career teachers: A mixed-method study. *School Psychology Review*, *45*(2), 226–249.

Simonsen, B., Fairbanks, S., Briesch, A., Myers, D., & Sugai, G. (2008). Evidence-based practices in classroom management: Considerations for research to practice. *Education and Treatment of Children*, *31*(1), 351–380. https://doi.org/10.1353/etc.0.0007

Simonsen, B., & Myers, D. (2015). *Class wide Positive Behavior Interventions and supports: A guide to proactive classroom management*. The Guilford Press.

Soares, D. A., Harrison, J. R., Vannest, K. J., & McClelland, S. S. (2016). Effect size for token economy use in contemporary classroom settings: A meta-analysis of single-case research. *School Psychology Review*, *45*(4), 379–399. https://doi.org/10.17105/spr45-4.379-399

Stainbrook, A., Juarez, P., & Blumberg, S. (n.d.). *Token Economy - VUMC*. Retrieved March 20, 2023, from https://vkc.vumc.org/assets/files/tipsheets/tokeneconomytips.pdf

Sullivan, T. N., & Bradshaw, C. P. (2012). Introduction to the special issue of behavioral disorders: Serving the needs of youth with disabilities through school-based violence prevention efforts. *Behavioral Disorders*, 37(3), 129–132. https://doi.org/10.1177/019874291203700301

Sutherland, K. S., Wehby, J. H., Yoder, P. J. (2002). Examination of the relationship between teacher praise and opportunities for students with EBD to respond to academic requests. *Journal of Emotional and Behavioral Disorders*, *10*, 5–13. doi:10.1177/106342660201000102

Sutherland, K. S., & Wehby, J. H. (2001). Exploring the relationship between increased opportunities to respond to academic requests and the academic and behavioral outcomes of students with EBD. *Remedial and Special Education*, *22*(2), 113–121. https://doi.org/10.1177/074193250102200205

The IRIS Center. (2013). Teacher retention: Reducing the attrition of special educators. Retrieved from https://iris.peabody.vanderbilt.edu/module/tchr-ret/

Vannest, K.J., Parker, R.I., Gonen, O., & Adiguzel, T. (2016). Single Case Research: web-based calculators for SCR analysis. (Version 2.0) [Web-based application]. College Station, TX: Texas A&M University. Retrieved Tuesday 31st May 2022. Available from singlecaseresearch.org

Vince Garland, K. M., Holden, K., & Garland, D. P. (2015). Individualized clinical coaching in the TLE TeachLivE Lab. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *39*(1), 47–59. https://doi.org/10.1177/0888406415600769

Westling, D. L. (2009). Teachers and challenging behavior. *Remedial and Special Education*, *31*(1), 48–63. https://doi.org/10.1177/0741932508327466

APPENDICES

Appendix A

Georgia State University
Department of Learning Sciences
Informed Consent

Title: TeachLive Pilot Study
Principal Investigator: Chelsea Marelle
Co-Investigator: Dr. Claire Donehower

I. Purpose:

You are invited to participate in a research study. The purpose of the study is to investigate TeachLive to train teacher candidates to implement classroom management skills. You are invited to participate because you are a preservice teacher who may benefit from this study. A total of up to six teacher participants will be recruited for this study. Participation will require up to 8 hours of time over the next 3 months. You will be compensated for your time with a $100 gift card. If you chose to withdraw from the study before the conclusion, you will still be compensated accordingly.

II. Procedures:

If you decide to participate **you** will:

- Be observed teaching a small group lesson lasting 20 minutes daily throughout the entire study
- Observations will be virtual- participant will be provided any necessary equipment to complete
- Participant must set up the necessary equipment before each session
- Participate in one 30-minute virtual professional development sessions via WebEx (three times throughout the entire study)
- Participate in one 30-minute virtual reality practice sessions with TeachLive at Georgia State University (three times throughout the entire study)
- Allow the researcher access to your classroom
- Implement chosen practices in small group instruction
- Complete surveys or questionnaires at the conclusion of the study

Children in your class will:

- Receive intervention while participating in their everyday classroom activities. If your classroom is allowed to participate, it will not take away from normal instruction time.

III. Risks:

In this study, you and the children in your classroom will not have any more risks than you would in a normal day of life.

IV. Benefits:

Participation in this study may not benefit you or your classroom personally. Overall, we hope to gain information about how to better manage student behaviors in the learning environments.

V. Voluntary Participation and Withdrawal:

Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may also skip any question at any time during interviews, focus groups, or surveys. Whatever you decide, you will not lose access to resources or services for you or the students in your class. The student investigator is your supervising instructor for student teaching. No preference will be given to those who participate. The decision to participate, or not take part, will have no effect on your grade or standing in your class.

VI. Confidentiality:

We will keep your records private to the extent allowed by law. The research team will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP)). We will use your initials rather than your name on study records. The information you provide will be stored in a locked file cabinet in Chelsea Marelle's office or in an encrypted and password protected server on her computer. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

VII. Contact Persons:

Contact Chelsea Marelle (cmarelle20@student.gsu.edu; 770-317-3266) or Dr. Claire Donehower (cdonehower@gsu.edu) if you have questions, concerns, or complaints about this study. You can also call if you think you have been harmed by the study.

VIII. Copy of Consent Form to Participant:

We will give you a copy of this consent form to keep.

If you are willing to volunteer for this research, please sign below.

_____ _____

Participant Date

_____ _____

Principal Investigator or Researcher Obtaining Consent Date

Appendix B

Participant Information Sheet

Name:
Major:
Graduation date:
Age:
Highest Level of Education (high school grad, associate degree, etc.):
Classroom role (i.e., student teacher, teacher or record, certified teacher):

1. How many years of experience do you have teaching?

2. Please describe your previous practicum placements (grade, class type, etc.).

3. Please describe any classroom/ behavior management training you have participated in? (i.e. online modules, professional development, course experience though GSU)

4. What items or rewards do you feel your students would be interested in (i.e. candy, pencils, stickers, fidget toys, etc.)?

5. What time would you prefer to have your daily virtual observation? (Remember these observations are only 10 minutes in length and need to occur during a small group lesson at the same time every day.)

6. Circle the evenings that typically best work for you to complete your three virtual training sessions. (Remember each session is only about 1.5 hours.)

Monday Tuesday Wednesday Thursday Friday

Appendix C

TeachLivE™ Scenario

Environment and/or Avatars
Your choices of environments are…. Kindergarten Table environment *Your choices of avatars are…..* Kindergarten table including Martin
Scenario Provided to Participants
Here, in 1 or 2 paragraphs, describe who the participants should embody in the scenario. Who are they? What are they like? How should they act throughout the scenario? You are teaching a small group reading comprehension lesson to students at the table. Your goal is to provide each student with multiple opportunities to respond throughout the lesson. You will read the book aloud to the students while incorporating opportunities to respond before, throughout, and after the reading. The opportunities to respond can all look different and be repeated for each student (i.e. asking for choral responses, written responses, calling on a student for individual response, etc.). Your goal is to have all students at the table actively engaged in the reading lesson with 2-5 OTRs per minute. Students will not be able to respond with thumbs up/ down and will not be able to read from the book because they cannot see it.
Interactor: Initial Response Information
Here, in 1or 2 paragraphs, describe the personality and characteristics of the avatars. How would they react in this scenario? The avatars will respond to the opportunities provided by the participant as directed. The avatars may raise their hand to respond, write answers down, or respond as a whole group when directed. Students will respond positively to any praise provided by the participant. Some students may shout out answers or questions when they are not prompted. Two students can be active participants who are eager to engage in the lesson. Two students can be more reserved and wait until a question is directed to them before responding or engaging. Students can respond with correct answers 75% of the time and then correct their answers with prompting from the teacher. Student shouts out of turn three times in the session but not in the first minute. Student stands up twice during lesson. Goes back to seated once prompted by teacher. Student produces a (stemming) vocalization once during lesson. Responds to teacher's prompt to engage with group.
Interactor: Follow-Up Response Information
Performance Objective for Challenge 1: *What is the performance objective for this first challenge? By the end of this 10-minute scenario, participants should….*

Participant Hits it….	**Avatars should…**
Be providing a high rate of opportunities to respond per minute (2-5 opportunities to respond per minute).	*Here, describe specific examples of how the avatar should react if the participant hits the mark. For example,* • *Respond to provided opportunities to respond* • *Verbally respond when called on*

Here, describe specific examples of a participant being successful. For example, uses…. • *Asking questions to individual students* • *Asking questions for the whole group to answer* • *Asking for students to raise their hand to respond to a question* • Asking for students to engage in the lesson through physical response (i.e. thumbs up or thumbs down) • Asking students to respond to questions by telling their peers • Asking students to respond to question by writing the answer down	• *Verbally respond when the whole group is asked* • *Raising his or her hand when they know the answer* • *Responding physically to a question (i.e. raise hand)* • *Writing the answer down when prompted*
Participant Misses it… *Here, describe specific examples of a participant engaging in the behavior incorrectly, or missing the mark. For example….* • *Participant goes over a minute without providing an opportunity for students to respond or engage* • *Participant provides more than five opportunities to respond in a minute*	**Interactor should…** *Here, describe specific examples of the how the avatar should react if the participant misses the mark. For example,* • *Students get antsy, fidgety, wiggly, or distracted when there are not opportunities to respond in a minute.* • *Students get overwhelmed, flustered, or upset when the opportunities to respond are given too fast or too close together (i.e. more than five in a minute)*

Additional Notes
Reflection prompts What easy about providing opportunities to respond during the lesson? What was hard about providing opportunities to respond during the lesson? How could you improve the opportunities to respond that you provided in the next lesson that you teach?

Teachlive Intensity Levels
Adult = no resistance – agrees with teacher perspective and strategies to help in the scenario
1 = mild misbehavior ->distraction, fidgeting, inattention at low frequency

Adult = needs clarification of terms / education vernacular / the situation – once clarified, a willing participant to teacher strategies – may push back and immediately drop it if highly offended

2= mild / moderate misbehavior -> distraction, fidgeting, inattention, mild resistance at low frequency
Adult= gentle resistance, validity of teacher statements needs to be addressed, if offended will push back enough to hopefully encourage a redirecting or rephrasing by the participant

3= moderate misbehavior - > distraction, fidgeting, inattention, resistance at medium frequency
Adult = Fully resistance to teacher / administrator – may put blame on others – it will take a sense of teamwork and respect of child and parent to win her over

4= moderate / intense misbehavior -> distraction, fidgeting, inattention, resistance, bullying behavior at medium frequency
Adult = resistant and noncompliant. Blames the school for the problem and the school should solve it – may request child transferred out of class

5= intense misbehavior -> distraction, fidgeting, inattention, resistance, bullying behavior at high frequency, including personal attacks towards teacher and students
Adult = Personally attacks teacher or administrator. Accuse and blames the teacher for the problem, wants child transferred out of class / school

Appendix D

Participant ID: _____ Date: _____ Session #_____

Start Time: _____ End Time: _____

Teacher Behavior		
OTRs (frequency)		**Rate Per Minute:**
BSP:		
Appropriate Delivery		**Rate Per Minute:**
Missed Opportunity/ Error		**Rate Per Minute:**
TRS:		
Appropriate Delivery		**Rate Per Minute:**
Missed Opportunity/ Error		**Rate Per Minute:**

Appendix E

Fidelity Data Sheet

Didactic Training Procedural Fidelity

Date: _____ Participant #: _____

Start Time: _____ End Time: _____

Welcome participant to the training session	**Yes**	**No**
Allow participant to ask any questions	**Yes**	**No**
Present the training slides	**Yes**	**No**
Introduce participant to the behavior skill of the lesson	**Yes**	**No**
Provide rationale for skill	**Yes**	**No**
Provide procedures for skill implementation	**Yes**	**No**
Provide models/ examples of how to implement the skills	**Yes**	**No**
Opportunity for questions after training	**Yes**	**No**
Post training assessment	**Yes**	**No**
Post training assessment feedback	**Yes**	**No**
Thank participant for participation	**Yes**	**No**
Total:		

Date: _____ **Participant #: _____**

TeachLive Fidelity		
Welcome participant to the training session	**Yes**	**No**
Allow participant to ask any questions	**Yes**	**No**
Provide participant with orientation to simulator	**Yes**	**No**
Remind participant of the target behavior skill for the session	**Yes**	**No**
10-minute simulator session	**Yes**	**No**
5-minute performance feedback (see table 2)	**Yes**	**No**
10-minute simulator session	**Yes**	**No**
5-minute performance feedback (see table 2)	**Yes**	**No**
Thank participant for their participation	**Yes**	**No**
Total:		

Performance Feedback Fidelity		
Deliver positive praise statement specific to performance	**Yes**	**No**
Give participant to share initial thoughts/ feelings	**Yes**	**No**
Provide rate per minute per each behavior (Session 1 OTR) (Session 2 OTR & BSP) (Session 3 OTR, BSP, & TRS)	**Yes**	**No**
Provide opportunity for questions	**Yes**	**No**
Provide one goal for second rehearsal session	**Yes**	**No**
Deliver positive praise statement specific to performance	**Yes**	**No**
Give participant to share initial thoughts/ feelings	**Yes**	**No**
Provide rate per minute per each behavior (Session 1 OTR) (Session 2 OTR & BSP) (Session 3 OTR, BSP, & TRS)	**Yes**	**No**
Provide opportunities for questions	**Yes**	**No**
Total:		

Appendix E

TARF-R Social Validity Measure

Self-Evaluation: Evaluation, Monitoring, and Maintenance
Social Validity

Please score each item by circling the number that best indicates how you feel about the TeachLive Intervention.

1. How acceptable did you find this TeachLive intervention?

1	2	3	4	5
Not at all acceptable		Neutral		Very acceptable

2. How willing were you to participate in this TeachLive intervention?

1	2	3	4	5
Not at all willing		Neutral		Very willing

3. To what extent do you think there might be disadvantages of this TeachLive intervention?

1	2	3	4	5
None		Neutral		Many

4. How much time was needed each day to carry out the classroom management interventions?

1	2	3	4	5
Little time was needed		Neutral		Much time was needed

5. How confident are you that this TeachLive was effective for your teaching career?

1	2	3	4	5
Not at all confident		Neutral		Very confident

6. To what extent do you feel like this intervention made permanent improvements to your classroom management skills?

1	2	3	4	5
little		Neutral		much

7. How disruptive was it to carry out these classroom management tools?

1	2	3	4	5
Not at all		Neutral		Very disruptive

8. How much did you like the TeachLive intervention procedures?

1	2	3	4	5
Do not like them at all		Neutral		Like them very much

9. How willing would you be to participate in TeachLive again?

1	2	3	4	5
Not at all willing		Neutral		Very willing

10. To what extent did you experience undesirable side effects of this intervention?

1	2	3	4	5
No side-effects		Neutral		Many side-effects

11. How much discomfort did your students experience with this intervention?

1	2	3	4	5
No discomfort at all		Neutral		Very much discomfort

12. How willing would you be to continue these classroom management skills in the future?

1	2	3	4	5
Not at all		Neutral		Very willing

13. How well did these classroom management skills fit into your daily classroom routine?

1	2	3	4	5
Not at all well		Neutral		Very well

14. How effective was this intervention in improving your classroom management skills?

1	2	3	4	5
Not at all effective		Neutral		Very effective

15. How well does the goal of the intervention fit with your goals for yourself as a teacher?

1	2	3	4	5
Not at all		Neutral		Very much

(Adapted from the TREATMENT ACCEPTABILITY RATING FORM—REVISED. TARF-R, Reimers & Wacker, 1988)