"TRY TO DO THE BEST YOU CAN": HOW PRE-SERVICE APE SPECIALISTS EXPERIENCE TEACHING STUDENTS WITH AUTISM SPECTRUM DISORDER

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Children with autism spectrum disorders (ASD) present an exceptional need for varied instruction within the physical education environment. Adapted physical educators need to be prepared to make a significant amount of choices in regards to adaptations and modifications given the situations they may encounter with their students. However, many pre-service adapted physical education (APE) specialists may be unprepared to address the unique challenges faced with children with ASD's ever increasing presence in the classroom. This study involved interviews and observations of four pre-service APE specialists who were working one-on-one with a child with ASD during a practicum. In this analysis four factors, 1) physical environment, 2) instructional strategies, 3) behavioral issues, and 4) personal discernment, surfaced as major influences in the decision making of the pre-service teacher. This analysis looks to build a foundational understanding of how this relationship exists in the APE setting with children with ASD. This study reveals that pre-service teacher have limited knowledge which leads to an inability to make important instructional decisions and overcome barriers that arise with children with ASD. Teacher-training programs should address these concerns in order to build confident and successful teachers.

Introduction

Adapted Physical Education (APE) at it's core, is physical education that has been adapted or modified, so that it is as appropriate for an individual with a disability as it is for an individual without a disability (Kelly, 2006). Furthermore, by definition, an APE specialist is a physical educator who provides direct services, e.g. teaching individuals with disabilities, and indirect services, e.g. assisting a general physical educator in modifying or adapting curriculum to fit the needs of children with disability in the least restrictive environment (Kudláček, Ješina, Štěrbová, & Sherrill, 2008; Sherrill, 1998). However, what is lacking is a consensus of a definitive, unified understanding of what a highly qualified teacher-training program needs to contain. An APE specialist, in approximately 16 states in the US (Wright & Wright, 2011), is required to hold certification above and beyond that of a GPE teaching certificate to teach individuals with disabilities outside of GPE. Lavay, Guthrie, and Henderson (2014), in an analysis of behavior management training and teaching practices among nationally certified adapted physical education (CAPE) teachers, revealed a majority (78%) had a master's degree, however, the amount of dedicated APE course work during various undergraduate and graduate degree programs greatly varied. Of the participants surveyed, 69% had taken 10 APE specific courses or less (Lavay et al., 2014). This evidence suggests a great deal of variability among APE professionals and accrediting programs; demonstrating a need for a better

understanding of the needs of APE specialists, in order to provide the appropriate coursework and practicum experiences to best prepare them for the teaching environment.

To best improve the future of the APE field, the factors influencing the perceptions and abilities of pre-service teachers (e.g. those who are still training in school or student teaching) must be better understood, so that changes within the teacher preparation programs can be made in order to better prepare future teachers. Graber (1995) demonstrated pre-service teachers have a greater difficulty incorporating content knowledge into lessons due, largely, to a lack of subject area competence, inability of the pre-service teacher to combine subject area expertise with appropriate teaching strategies, and a lack of knowledge about appropriate teaching progressions. With the need for APE specialists to understand a variety of content-based knowledge (Lavay et al., 2014), it is not surprising that there is a difficulty in incorporating content knowledge into daily lessons.

Ingersoll, Jenkins, and Lux (2014), recommend that physical education teacher education (PETE) programs can maximize knowledge development for pre-service teachers by structuring practicum experiences allowing for longer units and repeated units. By doing so, pre-service teachers will be more inclined to develop effective strategies in teaching, not on the rote knowledge needed for each changing unit. Stroot and Oslin (1993) similarly found that pre-service teachers provided evidence of content knowledge, but showed a limited ability to apply this knowledge when providing feedback. Ward, Kim, Ko, & LI (2015) in the efficacy of a content knowledge workshop, revealed a significant effect size (> 2.0) in teacher's pedagogical content knowledge, which in turn can have a meaningful impact on student learning. While, Ward and colleagues (2014) demonstrated this effect on in-service teachers, the necessity for future interventions can be diminished by properly preparing teachers to enter the profession. Pre-service teachers need guided practicum experience teacher-training programs need to provide opportunities to practice utilizing content knowledge in a realistic, but not altogether discouraging preview of what will occur when starting in the profession (Connolly, 1994; Graber, 1995; Jeong, 2013). Providing practicum situations where pre-service teachers can build knowledge through successful teaching experiences will go a long way to building confidence and prepare future teachers for what they will encounter as first year teachers (Morgan, 2008).

Effective teacher training becomes even more important when considering children with disabilities, especially those with autism spectrum disorder (ASD). According to the CDC (2014), currently 1 in 68 third grade students in the United States has ASD. Children with ASD are rapidly becoming a large portion within our population as a whole and are becoming an even greater number among individuals with disabilities. Global rates of ASD vary based on report and culture (Al-Farsi, et al., 2011; Parner, et al., 2011; Paula, Ribeiro, Fombonne, & Mercandante, 2011), however, it is clear that these children are in the classroom and the lack of knowledge and understanding of the disorder can cause a great deal of stress for both the teacher and the student. The American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), clinically defines ASD by a deficit in reciprocal social interaction and pragmatic communication, as well as high rates of repetitive behavior (2013), which pose very unique challenges within the physical education setting due to limited ability to utilize instruction and hyper- or hypo-sensory needs (Obrusnikova & Dillon, 2011). In addition to social/communicative deficits and repetitive behavior, children with ASD have also demonstrated motor delays (Bhat, Landa, & Galloway, 2011; Liu & Breslin, 2013, MacDonald, Lord, & Ulrich, 2014; Staples & Reid, 2010). Moreover, there is a great need for APE and GPE teachers to understand the behaviors and limitation of children with ASD, so that they can be better prepared to adapt and modify instruction. However, the current instruction for physical educators in APE is not designed to provide them the opportunities and experience with dealing with behavior management (Kudlácková, Ješina, Šterbová, & Sherrill, 2008; Lavay, et.al., 2015; Piletic & Davis, 2010). In order to better identify what changes need to be made, the influences facing an APE specialist needs to be better understood.

Young (2012) in an examination of pre-service physical education teachers concerns during early field experiences, demonstrated that within three teaching episodes (one lesson taught each week for three consecutive weeks) a significant shift from self concerning behaviors (i.e., anxiety, feeling under-prepared) to impact behaviors (i.e., Are students moving most of the time? Are students able to play the game successfully, etc.). This result demonstrates the necessity for pre-service teachers to have practical field experience teaching prior to graduation. Furthermore, this demonstrates strong evidence for ensuring students have experience with children with disabilities as well. However, this study takes into account one aspect (personal beliefs) of what is affecting the pre-service teacher's effectiveness.

Martin and Kulinna (2005) investigated the relationship of a teacher's intent and their effectiveness toward reaching that goal revealed that while teachers were 'pro' physical activity, health and fitness, they spent a majority of time (72%) on instruction and management and only 4% of time on promoting or demonstrating fitness concepts. Consequently, students spent a great deal of time (61%) either standing, sitting, or laying down (Martin & Kulinna, 2005). Without the necessary experience to create a structured learning environment, teachers will not be able to focus instruction on skills and activity, instead focusing on management, especially when considering the unique needs and challenges when working with children with ASD.

When considering the varied education, in regards to children with ASD, while teachers may have the best intents for teaching skills, if they are not given the necessary understanding the behaviors they will encounter or how to counteract them, much of their instruction will focus on management. In a recent analysis of APE specialist preparation regarding children with ASD (Healy, Block, & Judge, in press), only 48% of respondents were satisfied with how they were prepared by their graduate institution. Healy and colleagues (in press) recommend teacher-training programs add a specific course focused on ASD, but highlight the limited knowledge from university faculty to implement such a course. Clearly, with an already limited curricular experience with individuals with disabilities, the chance for gain knowledge about ASD is also limited. As this is a growing population within the school environment, future teachers need to have the knowledge and experience in order to be successful in the classroom; however, in order to understand what is necessary to include in course content, the factors that influence the decisions made in the classroom must also be understood.

Social Cognitive Theory

To best prepare future teachers for the physical education field a clear and focused education of coursework and practicum experiences are necessary to build foundational knowledge and efficacy within that content (Hardin, 2005; Taliaferro, Hammond, & Wyant, 2015). However, what is unknown is just how or what factors are affecting novice adapted physical education teachers when working with children with ASD; without knowledge of what factors to address, content for coursework is build blindly to address 'potential' issues based on understands from work with other children and disabilities or modified from what is seen in the general education or special education classroom. Bandura's Social Cognitive Theory (SCT) (1986) provides a theoretical understanding of how the relationship of individual and the environment should look like. SCT proposes that individuals are not driven solely by internal forces or the environment (Martin & Kulinna, 2005), but by a dynamic relationship between people and their environments (McAlister, Perry, & Parcel, 2008).

Additionally, SCT holds the belief that individuals exert a tremendous amount of control on how they interact with environmental influences and past experiences in being able to anticipate outcomes, engage in reflective thought, and self-regulate their own behavior (Martin & Kulinna, 2005), however an individual's self-efficacy plays a primary role in the decision making process (Bandura, 1977; 1997). In understanding how different influences affect pre-service teachers and their efficacy toward working with children with ASD, teacher-training programs can be enlisted to ensure that experiences are provided to build a pre-service teachers knowledge and efficacy with factors they will likely encounter as novice teachers. By understanding the influences affecting APE specialists, programs can be designed to give pre-service teachers systematic experiences in order to build content knowledge, as well as the efficacy to teach that content.

Purpose

To effectively investigate this phenomenon within pre-service teachers when working with children with ASD, the purpose of this study is to understand: 1) What factors influence pre-service APE specialist's self-efficacy when teaching individuals with ASD?, 2) What is the APE specialist's perception of his/her own utilized teaching strategies?, and 3) How does the relationship of the teacher and environment influence the pre-service teacher's self-efficacy of his/her own teaching practice?

Method

In order to best approach the research questions a mix of ethnographic interviews and observations were utilized, as the nature of this study was very inductive. This type of inquiry is particularly useful when researchers are interested in the experience of an individual within a naturalistic setting (Connolly, 1994). To better understand how an individual experiences a given topic, interviews and observations can provide insight into these experiences (Brinkmann & Kvale, 2015) because that person's *voice* is important (Siedman, 1998). By allowing experiences and, subsequently, themes to emerge from within the data, the researcher was able to induce a better understanding of the

influences that have an affect on pre-service APE specialists when teaching children with ASD. In the following sections, the researcher describes the steps taken to ensure the trustworthiness (e.g. the credibility, transferability, dependability, and confirmability) of the analysis and the findings according to Lincoln & Guba (1985). Prior to conducting the study, IRB approval of the protocol and site approval was received. All participants were informed of their rights and the precautions taken to ensure their anonymity. As the researcher was acting purely as an observer and no specific child information is included in the analysis, child assent was no needed. However, parents were made aware of the presence of the researcher in the environment and the study's aims; parents were given the right to have their child excluded from observation, but no parent elected to remove their child.

Participants

A purposeful sample of 4 pre-service APE master's students, 1 male and 3 females, was chosen for participation in this study. Participants were between the ages of 22-24 and had a background in physical education (e.g. a bachelor's degree in a physical education or related field). All participants had previous experience with student teaching in GPE, but none had ever been formally employed as a physical educator. All had limited to no experience with teaching APE prior to beginning their master's training program; none of the students had a direct experience prior to the master's program working with children with ASD. Participants were specifically recruited because they worked with at least one child with ASD in their practicum placement and for their desire to become an APE specialist after graduation from the Master's program. To retain their anonymity, all participants are here referred to by a pseudonym.

Derek is a 23 year-old male from the New England area. The year prior to beginning the master's program and practicum experience, he graduated with a bachelor's degree focusing in physical education with a concentration in APE (12 total credit hours). During his undergraduate experience, he worked with individuals in a fitness center, as well as at an aquatics center. Individual disabilities varied greatly from physical to cognitive, but Derek had no direct work with an individual with ASD during any of his experiences. After graduation from the master's program, Derek expected to get a job as a GPE or APE specialist, but was leaning more toward APE.

Samantha is 22 year-old female, also from the New England area. She entered the master's program with a bachelor's degree, majoring in physical education with no minors. During her undergraduate experience, she had 18 total working hours with individuals with disabilities. The focus was a community-based motor skill program and worked on functional skills with its participants. No one in this program was clinically diagnosed with Autism or ASD. After finishing the master's program, Samantha wanted to get a GPE or APE job back in her home state, as she was certified in that state through her undergraduate program.

Lyndsey is a 22 year-old female from a mid-Atlantic state. Upon enter her master's degree studies, she has a bachelor's degree in kinesiology with a concentration in physical education with an minor in APE. Of the participants, Lyndsey had the greatest prior experience working with individuals with disabilities; consequently, she was also the most adamant about finding an APE position after graduation. During her undergraduate degree, she volunteered with Special Olympics and with an adapted gymnastics program. During her volunteer experience, she came in contact with individuals with Autism and ASD, but had no direct working experience with them.

Stacy is a 24 year-old female from a mid-Atlantic state. Stacy had a bachelor's of science degree with a focus in health and physical education. She graduated the December prior to starting the master's degree program and worked as a substitute teacher until starting. During her substitute teaching, she had the opportunity to teach several classes in physical education and health. During this experience, she worked with students with disabilities included in GPE; none of the students, to her knowledge, was diagnosed with ASD. Upon graduation, Stacy wanted a GPE position, but looked forward to utilizing her APE knowledge to modify instruction for each and every student.

Site

As part of their practicum experience, participants taught APE (one-on-one) at a local school for children with ASD. While not completely indicative of all future placements within their careers, participants had the opportunity to work with the various behaviors, motor deficits, and communication abilities associated with ASD, allowing them the opportunity to try different behavior management, communication, and motor skill development strategies. Based on the individual child's IEP goals and objectives, participants worked with his or her student 1 to 2 times per week.

Data Collection

Interviews. In order to assess the how different factors influence the APE specialist, the researcher chose to utilize data collected through ethnographic interviews and observations. Interviews allowed the researcher to gain insight into the thoughts and perceptions of the developing pre-service teachers. Interviews were conducted pre- (one week prior) and post- (one week after) observations. The pre-observation interview was utilized to discover demographic information, past experience, as well as current perspectives on teaching. Additionally, questions were asked to build an understanding of what the participant perceived of how his or her student reacted to instruction. Questions were asked one-on-one in a semi-structured, open-ended format to allow for detailed answers, as well as opportunities for follow-up questions. This allowed the interviewer freedom to probe certain questions further or ask another question in an area that was not originally thought of (Patton, 2002). All participants were interviewed with the same set of initial questions; further probing questions were based on individual responses. Once pre-interviews were completed, an informal analysis was done to create a baseline of codes to use when observing (See Table 1).

Table 1. Emergent Themes and Codes

Themes	Code List	Example
Physical Environment Issues	Space	The room is divided by a moveable temporary wall; creating two spaces the gross motor area and a computer/TV area. This barrier leaves about 2/3 of the room for the gross motor area. … On the north wall there are two doors leading to other classrooms, these doors are often left open. On the West wall there is another door that leads directly outside, although there is often a chair in front of it. Just as you enter the door, to the left on the east wall, there is a set of lockers that is used by staff to keep personal belongings in.
	Location	The weather has been so awful, we haven't been able to go outside and when we go outside, it's like usually like 100% she is attentive and able to do things.
	Others	Multiple students have come in and out of the room, some very briefly other not. Most are on some sort of break, they have little to no direction.
Instructional Challenges	Equipment	…not having enough equipment to have like a huge basket of basketballs, so he knows when he gets done with the basket he's done.
Instructional Challenges (cont.)	Time	S "Lets do one more then break" Aid, "I already told him it was break"
	IEP/Behavior Plan	She now has break cards, where if she takes one it's a two-minute break. And it's good, because it gives her time and space to calm down, but it does take out of out APE time.

Behaviors from Child	Positive Behavior	They walk about halfway around the U, then student starts jogging and S jogs with. Student jogs all the way to the end of the U… S encourages Student, "Nice job, nice job, go, go, go", student jogs all the way back around the U.
	Repetitive and Stereotypic Behavior	Student bounces on the ball, makes high pitch noises and flaps hands.
	Tantrum/Scream/Crying	D holds student's hand. Student walks with D, occasionally crying. When student is crying, D and aid stop until student stops crying
Personal Discernment	Past Experiences	…we don't really know a whole lot at this point, so the first couple weeks it was just getting to know your students, and like trying to survive.
	Self-Efficacy	If the kid is having a bad day, not gonna take it personally as I did in the past, like what am I doing wrong. You just have to realize like these kids are just having an off day, it mightn't be what your doing, it might be something else.
	Perception of Effect	As we walk back to the office, L says to me " some success is better than none"

Observations. To build an understanding of the external factors influencing the behaviors of the participants, in conjuncture with interviews, the research observed the environment that the participants taught his or her students. Observations (N=16) permitted the researcher to discern behaviors mentioned during the pre-interviews, as well as analyze what other factors were influencing the participants that were outside of their perception. Observational data were kept through a running record, as well as analytic and reflexive notes, capturing a detailed description of the events that occurred throughout the lesson; this level of strict accounting allowed the researcher to better analyze the situation by limiting bias through capturing as much detail as possible.

Each participant was observed once per week for 45-60 minutes, over the course of four consecutive weeks. By witnessing behavior over multiple weeks, the researcher was able to better understand the phenomenon that is occurring within the APE class setting as opposed to observing each individual once and witnessing a random occurrence. In addition to seeing participants multiple times, effort was made to see participants different times, days, and with different children to capture a greater range of occurrence. Credibility of the results was achieved through triangulation by analyzing multiple observations and interviews both within individuals and across participants (Lincoln & Guba, 1985). Lastly, a post-observation interview was conducted in an open-ended, semi-structured format similar to the pre-observation to further understand the beliefs of each participant. In this interview, the researcher sought to gain further understanding of the initial themes that emerged from the data, as well as gain insight into participant's perceptions of behaviors, etc. captured during the observation. Participants were asked his or her beliefs on how each of the themes was an influence on his or her teaching.

Data Analysis

Utilizing thematic analysis, as described by Braun and Clarke (2006), data was systematically coded and analyzed so that certain themes were allowed to 'emerge' from within the data (Table 1). Thematic analysis is not based on any pre-existing theoretical framework, and therefore can be used within different frameworks (Braun & Clarke, 2006). By utilizing this framework for analysis, thematic analysis affords the researcher the ability to incorporate a variety of background guiding principles. Bandura's SCT (1985) and Theory of Self-Efficacy (1977) for understanding behavior influences, creates the foundation of understanding that behavior is not guided by any one

factor, but an coalition between internal and external factors. These theories provided a guiding lens for the researcher to focus on, both, the environment in which the participant was teaching in, the participant's individual concerns, as well as the interaction between them. By following this guide, factors influencing the behaviors of the pre-service teacher were allowed to emerge from the data.

A better understanding and implications can be made by inductively looking at the data and allowing the themes to emerge through systematic coding (Refer to Table 1). Braun and Clarke (2006) put forth five phases for analyzing data: (1) familiarizing yourself with your data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, and (5) defining and naming themes. During the analysis for this study, following these five phases, the author, thus allowing for a deeper understanding of the data before the analysis occurred, completed the research. The researcher transcribed all interviews, verbetem, to ensure as much detail was included as possible. Handwritten observation notes were typed within 24 hours of completing the observation to ensure the freshest account of what occurred was detailed. In addition to keeping running records, the researcher kept analytic notes for each observation to allow for early analysis to be captured, as well as how the researcher was feeling and the thought process during that day's observations; capturing the vast variety of the differences that can occur each day for a person and taking that into consideration during analysis. During the beginning analysis, initial codes were developed through reading the interview and observational data (See Table 1). Themes were developed based on how certain codes fit together after initial coding. These themes were then reviewed, defined and then reviewed again to ensure they captured the true essence of the situation.

Trustworthiness and Credibility

This study was conducted in accordance to ethical standards defined through Internal Review Board approval. All participants signed a consent form for this study and were assured anonymity through the use of a pseudonym. The administration of the school was notified of the researcher's presence and study protocol, and site consent was granted. Lastly, a passive consent letter was sent to parents of the children that participant were working with detailing the study and informing them of our purpose. Trustworthiness and credibility were established through utilizing multiple sources of data over repeated occurrences. Additionally, triangulation was utilized to not only analyze data within one participant, but across participants as well; this allowed for a better understanding of how the themes transferred across individuals and situations (Lincoln & Guba, 1985). Member checks were done with participants to ensure that true opinions were being captured and not misrepresented; when there was a discrepancy about what was thought and what was captured, participants were asked to further elaborate and provide additional thoughts. Finally, a peer debriefing was utilized with an unaffiliated peer to ensure the validity of the emergent themes; this peer was given several excerpts of data with no identifying information (outside of the pseudonym), as well as the developed coded, and asked to verify the codes validity and the researcher's coding fidelity.

Findings

Through the use of thematic analysis (Braun & Clarke, 2006), four main themes 'emerged' from the data. These themes, as seen in Figure 1, all have influence on the pre-service APE specialist, and in-turn affect how the teacher will teach a child with ASD. Because teaching is reciprocal in nature, how the teacher teaches something will have an effect on not only their own experience and perceptions, but the child's behavior as well. Though the interviews and observations, it became clear that, as Bandura's SCT suggest, factors influencing the teacher are grouped into both intrinsic and extrinsic factors. Intrinsic factors, only affecting the teacher, include past experiences and their perceptions of the various teaching strategies, from here on referred to as personal discernment. Extrinsic factors are outside of the influence of the teacher and include the physical environment, instructional challenges, and the behaviors of the child. These factors influencing the teacher are not, wholly, revolutionary in the findings, but what one would logically find being involved in the teaching process of any individual student. This analysis however, gives insight into what is occurring in each of the influence factors when working with an individual with ASD, so that we may better understand how to prepare future teachers to work with this population of students.

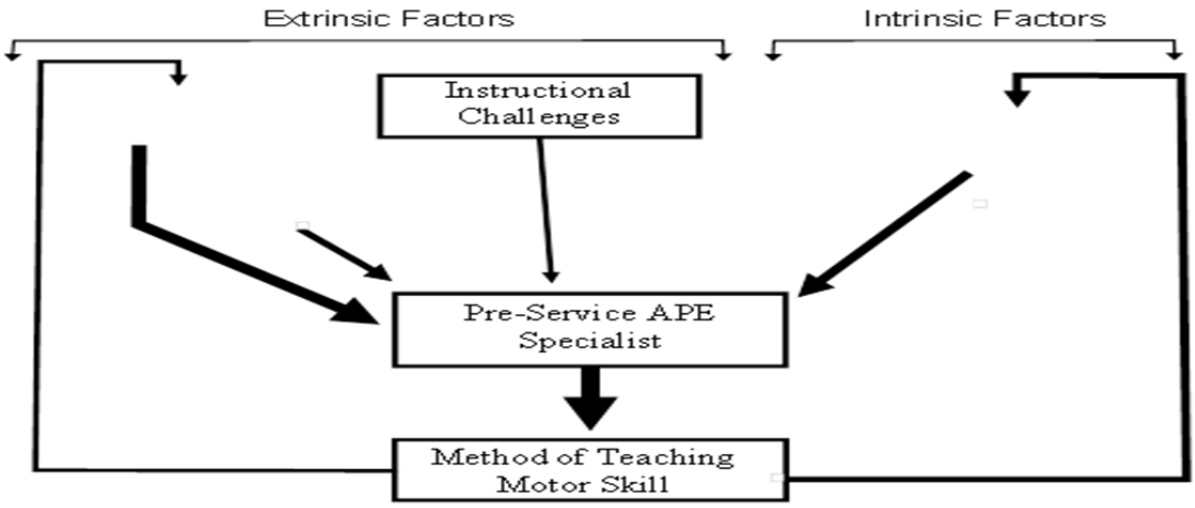

Figure 1: Factors Influencing the APE Specialist

Physical Environment Influences

During interviews of participants' teaching, it became very evident that the physical environment plays a large role in how the APE specialist addresses any given situation. The physical environment contains anything that is in proximity to the teacher and his/her student. For this study, the physical environment included a multi-purpose room that the majority of APE classes were held, the objects within that environment, and the number of 'other' individuals using the same space, as well as the noise level within the room. Each of the participants had some experience where the environment affected his or her teaching. One participant mentioned, … *the room that we work in most of the time is so small and there's so much going on in there. (Derek) Samantha* further describes the effect of the environment: "… when it's rainy or snowing, we have to be in that room.*"*

While a general gross motor room shared with the school, it not indicative of the placement of all APE specialists, it mimics the struggle APE specialists can face when working with a child with ASD. Many APE specialists will not have the luxury of having the gymnasium or motor room to his/herself each class period; often the room will be shared with the GPE classes or other small groups. Outside of the teacher's control, the environment can determine whether a certain activity can or cannot be completed. While many teachers have their own gym, they too are still at the mercy of school scheduled events, pictures, etc.

Throughout the interviews and observations, it was evident the environment also affected the child's behaviors, which has also been demonstrated in the literature (Virues-Ortega, Julio, & Pastor-Barriuso, 2013):

As we all get to the [gross motor room], the aid opens the door, it is very loud as we enter. D goes to the northwest corner and sets a black mat up on the floor… Student (St) begins to cry and falls to knees with his head on the floor. – *March 24, 2014*

Clearly, the environment not only limits the activities, but also may cause some unwanted behaviors to occur; *Stacy* stated, *If you [are] in an environment that has a lot of distractions in it, a lot of kids [or] a lot of things going on, especially because of kids with autism, their [going to] be looking everywhere. Moreover, Derek continues, Especially if [with] kids with autism, they can be easily distracted and there's a million noises and people coming in and out, it can definitely play a role, [it can have a] negative effect on it.* While in the situations presented in this analysis and not wholly indicative of all APE one-on-one settings, the majority of teachers will find that the space they are working in will have a great affect on what they are doing, who they are working with, and what they will be able to do.

All of the issues of space and environment play into what the teacher can expect to get out of the lesson for that day; the pre-service APE specialists were very cognizant of what his or her student could do, given the environment and would affect the lesson. *Lyndsey* states:

Some students, they [are] really set off with crowded spaces, [so] I am going to adjust for how much instruction I am going to expect out of them… giving them new things in an environment where its crowded or something is going to upset them.

By pre-adjusting their instruction for the environment, in order to pre-empt certain behaviors and increase learning time, pre-service APE specialists demonstrate the effect the environment plays. This however is often a skill that is 'learned' through trial and error; teachers in any field acquire this talent to read their students and adjust instruction on the fly. While this would be difficult to gain from any classroom instruction, it would be possible to access this skill set through practicums. Furthermore, the APE pre-service teachers understand what needs to be done to adjust and modify for it, further demonstrating its importance and need for inclusion for understanding for future teachers. *Stacy* says:

I mean, I don't let it bother me, I just go with it or I try to put her in a position where she is less distracted, so she's not, seeing things and can focus on what I am trying to say.

By improving the pre-service teacher practicum, future APE specialists will be better prepared and flexible due to their increased experience.

Instructional Challenges

If the environment is the space in which the teacher and student occupy, the instructional challenges can be explained as everything regarding the instructional portion of the lesson. This would include the equipment available, the time frame involved, as well as a student's IEP or behavior plan. All of these influences put certain constraints on what can or cannot be done during APE. When observing Samantha in this situation occurred:

S says *are there any soccer balls, yesterday, I didn't see any.* Another aid says *there is about 5 over in the play-area. St says ok, I will go explore and leaves the GMR.* S says *I will set up, and give you a minute to play.* S spins in a circle. S sets up a spot about 4 feet from basketball hoop. *– April, 8, 2014*

The APE specialist needs to either adapt other equipment to fit the needs of the lesson or work on a different goal for that class period. As see in the example above, Samantha wanted to work on basketball shooting with her student, but had to adapt the equipment that was available. While not the case in all situations and for every person, but for most, instruction is greatly influenced through the environment and equipment available, When asked *Samantha* revealed, *Sometime there's equipment, sometimes there's not.* Which was also shared by *Stacy*, *At [name of school], they have like nothing and so that makes it hard when you are trying to teach things. and Derek Whatever's there [is what] you have and there's not really many options, so… you really have to work with what you have. Try to do the best you can.*

Participants in this study understood modification was necessary and utilized what was available. While not every physical education teacher will have the same issues with equipment, often APE specialists will be sharing equipment with others, as typically many are itinerant teachers traveling from building to building. While these observations and interview responses may not replicate what is most teachers experience on a basis of equipment reliability, many teachers will understand the need to modify what existing equipment they have to fit the needs of their student. Often in order to modify equipment, as mentioned previously by Derek, teachers will need to work within the confines of what they have.

In addition to equipment, a child's behavior plan or reinforcement schedule had a great effect on the instructional goals for the lesson. Certain behavior plans for children with ASD utilize a time-on/time-off schedule or a break schedule. A time-on/time-off schedule would entail the child working for a certain amount of time, and then having a 1 to 2 minute break from guided activity. *Samantha's* student utilized this type of schedule, in which, her student had two minutes on and one minute off. She said:

> *Yea, so, typically it's chunks of type, with 2 minutes of work, 1 minute of break…and trying to jump between activities. So, typically it's walking on treadmill for two minutes, then he gets a break [sic] but then it depends on the day too. [sic] Two weeks ago, he literally laid on the floor screaming for the whole thirty minutes so, but yeah, typically it's chunks of [time].*

As a result, regardless of all other factors, this participant lost a third of her instruction time, severely impacting how much she could do in a particular lesson and as seen in the example, that time can be even more limited due to behaviors very typical to children with ASD; this evidence is repeated consistently in other research (Obrusnikova & Dillon, 2011). Further, *Lyndsey's* participant has a student on a break timer where they may use verbal or non-verbal communication to request a break from instruction; when asked about is she said, *She can use it, like eight times in a*

session and we get nothing done. By the end of [the] session, and I have to go, … I have another student and there's … that break.

This was further demonstrated the end of one observation: *On our way back to the office to check out. L says she feels unproductive with St's long breaks. That each one is 5 minutes long (Recorded April 15, 2014)*. By taking time off from instruction, the teacher has no choice, but to modify or limit the instruction; either the number trials for a certain skill must be cut short or the number of motor tasks for the lesson must be limited.

Behaviors from Child

The behaviors of the child with ASD, on- or off-task, can, arguably, be one of the largest influences on a teacher's instruction. *Derek* demonstrated frustration when asked, saying, *Within that 30 minutes [talking about the APE time], you might really only get like 5 minutes of actual teaching in.* A child with ASD can display a variety of behaviors, including social-communication deficits and repetitive or reciprocal behaviors or interests (DSM-5, American Psychiatric Association, 2013) that inhibits them from entertaining the cues for a given skill or will focus on extraneous details that are unimportant to the development of the skill. Furthermore, because it is a spectrum disorder, behaviors can vary a great deal from child to child (Scheuermann, Webber, Boutot, & Goodwin, 2003), so one set of guidelines will not work for all children with ASD. As seen by the numerous amounts of evidence-based practices for ASD (Wong, et al., 2013), it takes a multidisciplinary approach to modifying the instruction utilizing multiply strategies to limit the frustration for the child. All of which affects how the teacher will approach the lesson or activities; *Lyndsey* revealed:

If it's a bad day and the behaviors are really showing, then really the entire structure of the class is going to be different, cause the new goal is to keep his behaviors down, so the bad day gets turned into a good day. [sic] I might have all this exciting stuff planned, but if that's going to set him off, then that has to take a backseat. Likewise, that same student had a really great day the other day, and I took advantage of it.

As well as how a teacher approaches the lesson, itself; *Stacy* stated:

> Today, she was really excited and will jump up and down. Which I take advantage of, you know, I'll hold her hands and dance or whatever. If they are pretty much done, there is no point in pushing them more for the lesson.

Through the child's behavior, a lesson could be extremely productive or unproductive. Throughout the observations, it became very clear, when a child is displaying a lot of behaviors, not much will get done for that lesson; for example in the following excerpt from observation notes:

St begins to cry and falls to knees with his head on the floor. St continues crying, while scooting across the floor. D moves to the mat and moves St into a sit up position, St continues to cry. D kneels by S's feet and grabs St's hands. St uses D's hands to pull himself up during the sit-ups. *(Recorded March 24, 2014)*

In this example, the behavior of the child dictated the course of the lesson and ultimate what skill was worked on; in an attempt to continue practicing and not lose out on PE time, Derek began practicing sit-ups with his student. While this may have not been a goal for the lesson, the behavior of the child caused the teacher, Derek, to adapt his plan and try to salvage the lesson.

On the other hand, if the child's behavior is not distracting to the lesson, a lot can be done in a short amount of time, as seen in the following excerpt:

After a fifth trial, St and S jump together. St smiles. S says "Jump it out" holding St's hands as they jump up and down. St gets the picture schedule out again, what's next. St [says] *Catch*. St stands on a spot and S kneels about 2 feet in front of St. S says hands out, look at ball. S tosses to St, St catches with two hands, then squeezes the ball. S says *I want you to catch with your hands* 1, 2, 3, *look at ball, catch*. St catches! S asks for the ball back. St jumps. S [says] *jump, jump, jump*, S *look at ball* repeats [catch routine] 4 times [successfully]. *(Recorded April 8, 2014)*

Multiple participants in this study utilized picture schedules to alert students to changes in activities, as well as what was being done for the day and when they would be done. Not only does this strategy give the student an understanding of what is coming up, but it can also be a way to improve their autonomy within the lesson. On the subject, *Lyndsey said, …she has a picture schedule that she chooses from, and you know for a student that does not*

really like APE, it's important that she feels more control. However, in the focus of this study, the behavior of the child plays a crucial role in the APE specialist's ultimate decision on what or how to teach the skill. Looking to Figure 1, through the behavior of the child interacting with the other factors on the APE specialist, the APE specialist will need to adapt his/her instruction to fit those factors and constraints. Additionally, depending on how the teacher utilizes the information the method of teaching will have a positive or negative effect on the child's behavior and thus affect the future teaching of the APE specialist.

Personal Discernment

During interviews and observations, it became clear that the teacher's perception of his/her own effect of utilizing teaching strategies and past mastery experiences were major influencing factors, along with the individual's self-efficacy due to past experiences; these themes played a very large role within the individual and interacted with their past experiences. By understanding the perceptions of teaching strategies and the effect they have on the situation at hand, future adjustments can be made to build confidence in utilizing the strategies. By building confidence with the strategy teachers will be able to be more effective earlier in their teaching. In a statement made near the end of her practicum teaching experience, *Lyndsey* stated:

I always wish I had more of that beforehand, um, I wish I had experience in a special education classroom, where they use more strategies that have to do with behavior, like, picture schedules or token reward systems. Um, I learned them soon enough when I came here, but also, it would have been nice to see a variety of them in use.

Without an exposure to effective evidence-based practices, future teachers are forced to learn as they go; which often wastes a great deal of his/her time and more importantly the student's.

Furthermore, each participant's unique background and perceptions played a large role in how he/she addressed the current situation. Each of the participants, before beginning their practicums, had little experience teaching individuals with disabilities, especially those with ASD. The majority of their pre-service experiences were in a GPE environment; their APE experiences were limited to either a limited number of students with disabilities included in a GPE classroom or one-on-one situations with a student with a disability. None of the participants, to their knowledge, had experience working with a student with ASD. Additionally, as the research suggests (Piletic & Davis, 2010), the majority of students had only one informational course focusing on APE: *Stacy* said, *We did have an adapted physical education class, but they didn't teach us [different strategies] or the different models of the specific disability, it was like a more general information class* This limited experience, had a direct role in the understanding and utilization of instructional strategies, shown by *Lyndsey*:

> The tricky thing is knowing [sic] are the things you are doing on the right track. Like is it me or the student… Am I helping a kid reach their potential or am I less than what could be. It's really hard to know.

Almost all the participants mentioned learning from one form or another of trial and error; said best by *Samantha, To be honest, a lot of trial and error… a lot of it is trying it, if it doesn't work move on… we can try this and when it work, they were like we can try it.*

Without the proper preparation for understanding the behaviors and how the evidence-based practices can work in the classroom, teacher's success rate when working with students with ASD is greatly lowered. The lack of confidence was shown by *Stacy*:

> At the beginning of the year, I wasn't confident, just because I wasn't confident with [the evidence based practice], never heard of it. Didn't know what is was and was kind of shell shocked, when [my advisor] was like your starting this week, like 'good luck'… so the first couple of weeks it was just getting to know your students and like trying to survive.

Derek had this same recollection when asked about how he felt at the beginning of his placements, … *yeah, definitely didn't have the strategies for it.* Limited experience and lack of understanding of strategies, may lead teachers to making a poor decision in choosing a method for teaching a skill, which may inadvertently negatively affect the behavior of the child, creating a snowball effect of bad behaviors. Referring back to Figure 1, the themes influencing the APE specialist, both internal and external have an effect on how that skill is taught; this then affects his/her own perceptions, as well as that of the student. This reciprocal nature of teaching can work in favor or against the teacher; by starting out with a good 'trick bag' future teachers will be more prepared to work within the other influencing factors to create a successful and effective lesson.

A teacher who is knowledgeable has a better understanding of what can work in a situation, and because they have knowledge of it or past experience, can make a more effective choice, shown by *Samantha*, speaking about her confidence after practicing for several months:

I feel like I have a cool bag of tricks and that I can pull from and experiences that I can draw from and say oh this behavior is similar to what so-and-so did and I know that when I had that before, this is what I did, so let's try this.

By building a repertoire of different skills and strategies through content knowledge and experience, participants in this study felt more prepared to encounter future situations. *Derek* discussed how he feels now moving forward to a future job:

Yeah definitely have the strategies for it. It depends on the kid and their behaviors, but I think definitely more so than I did before starting here… Oh, yea more confident. [sic] I've seen things that work, things that don't work.

By gaining positive experiences during the practicum, participants, in a short period of time, felt more confident to teach students with ASD in the future.

Discussion

To effectively understand the areas of need to meritoriously prepare future teachers to work with students with ASD, the primary influences of his/her teaching must be clearly defined. Ward (2014) admits that little is know about what it means to "*know physical education well enough to teach it*" and much more research needs to be done to define what teachers need to know. Through the breakdown of the influences guiding the teacher in his/her teaching, teacher-preparation programs can develop curriculum with an understanding of what needs should be met in each course. The first question this analysis sought to answer was: *What factors influence pre-service APE specialist's success when teaching individuals with ASD?* Though a thematic analysis of interviews and observations, behaviors from the child, instructional challenges, physical environment issues, and personal discernment arose as influencing factors. The influencing themes arising in this study are not uncommon and upon first glance would be what one would expect to see as influencing factors for a teacher regardless of discipline or geographical location. However, the benefit in this analysis is in the emergence of how future teachers feel about their potential for success in the future and, from participant answers, that future teachers are still not being prepared in the most effective way to gain a practical knowledge of what to do when teaching.

Research (Healy, et al., in press; Taliaferro, et al., 2015) suggests a balance of content knowledge and practicum experience is absolutely necessary to build confident teachers when working with children with ASD. When considering the limited knowledge base given about ASD and the prevalence of ASD in the classrooms, teacher-preparation programs need to include opportunities in practicum experiences for pre-service teachers to work with children with ASD (Hardin, 2005). It is evident that physical educators are gaining content knowledge, but lack the understanding to utilize that knowledge and link it to the current situation (Connolly, 1994; Graber, 1995; Taliaferro, et al., 2015). With a small amount of personal experience teaching children with ASD or a limited knowledge base of strategies to use, the pre-service APE specialist is limited to guessing. Without having previous experience, pre-service teachers will not be adequately prepared to handle situations as they happen and will be subjugated to a 'learn-as-I-go' method for developing strategies to teach students.

When considering the environment, as the findings of this study suggest, most APE specialists will need to be creative if 'pulling' students out of GPE; most likely, they will need to find a corner of the gym no one is using or an empty hallway. If weather or other circumstances force teaching to take place in the gym or multi-purpose room, the number of activities that can be presented maybe limited. For example, walking, running and riding a bike around the outdoor track is a popular and motivating activity for many of the children at this school, but these activities cannot be presented in the multi-purpose room. Furthermore, issues pertaining to the environment are well-known problems for children with ASD and in terms of behavior management, there are many things that a teacher can do to either preempt certain behaviors or modify the activity to adjust for a displayed behavior; it is evident in countless teaching strategies and behavioral interventions (Wong, et. al, 2013), but these strategies are often not a part of formal education of a PE teacher. If they are, strategies are very brief and a part of a much broader instruction.

Teacher-preparation programs know what future teachers should know and give an effective base of content knowledge for the skills they should teach (Connolly, 1994; Graber, 1995; Stroot & Oslin, 1993), however as was

reported by participants and is echoed by research (Ingersoll, et al., 2014) there is a disconnect between the pre-service teacher's content knowledge and the ability to implement that information (Ward, 2014). Participants in this study each had a sufficient GPE background of coursework from their perspective undergraduate institutions; nevertheless, participants lacked an ability, at the beginning of the study, to connect that knowledge with practice, especially when working with children with ASD. Children with ASD pose very unique needs in and out of the classroom and teachers need to be prepared for this. Meaning, they need to have the content knowledge of ASD, evidence based strategies to work with this population, and experiences to practice.

The next question driving this analysis was: *What is the APE specialist's perception of his/her own utilized teaching strategies?* This question emerged as a factor of the participant's personal discernment; in many of the conversations with the participants, whether in interviews or during observations, elements of uncertainty cropped up. At one point or another, participants mentioned a limited ability to perceive the effectiveness of his/her teaching or were at a loss for what to do in a situation. Often participants would default to what was done with other students or continue to try the current strategy unsuccessfully. Future adapted physical educators will face a variety of difficulties, behaviorally and physically, when teaching individuals with ASD, unique to what the other students with disabilities may pose. The participants at the beginning of his/her practicum displayed an extremely limited knowledge base and experience with students with ASD. To alleviate issues for both the teacher and the student, teacher-training programs should look to build experiences that help build a teachers knowledge and understanding of a variety of situations. As the saying goes, *if you have met a person with autism, you have met one person with autism* (Unknown); because of the nature of the disability, each child could demonstrate any number of behaviors that occur from children on the spectrum.

Since the participants had 1) a limited knowledge of the disability and 2) a vastly limited number of evidence based strategies for children with ASD, he/she were severely limited in the effectiveness of his/her instruction. Without being able to effective address the issues faced, participants were limited on the overall number of goals and objective he/she could reach for any given skill. Furthermore, participants were limited to the number of trials that could be done in any given lesson. In order to be able to improve the overall success of the students, pre-service teachers need to be given a insight into evidence based practices and the opportunities to utilize those strategies in a practical way. Future coursework should incorporate a greater understanding of what types of issues will be faced with individuals with ASD and what strategies work best. At minimum, this will give the teacher a base for what to expect and what to do. In addition to content knowledge, future APE specialists would benefit from hands-on experience in order to practice those skills and hone their craft (Connolly, 1994; Taliaferro, et al., 2015). By building a better base of knowledge and experience level, future APE specialists will be more ready to act on the factors that influence their teaching.

Lastly, this study sought to understand: *How does the relationship of the individual and environment influence the individual's efficacy of outcomes?* Bandura's SCT (1986) describes that there is equal reciprocity between the internal thoughts and drive of the individual and the environmental factors that surround them. In this analysis, it became very clear that this was happening in each of the participants. Each participant had a fairly similar background of knowledge and experience with GPE prior to beginning their practicum experiences. Within each participant, the past experiences and self-efficacy of his/her teaching played a big roll in what he/she perceived could be done in any given lesson. On the other side, the child, environment, and situation each had an equal effect on the participant's decision of what or how to teach it (Figure 1).

In understanding not just that this relationship exists, but 'how it exists' is an important step toward making suggestions for teacher-preparation programs to build into future instruction. In this study, the instructional challenges and environmental factors were often mediated or exacerbated by the participant's personal discernment or behaviors from the child. If the environment had many distractions, the child's behavior would be effected; the APE specialist must then look at past experience, then decide if those were good or bad experiences, and from there, chose a way to teach for that given situation; this entirely happening within the teacher. With a limited amount of time, equipment, or a forced structure, an APE specialist has to fit the lesson and motor tasks within these constraints or it will not work. When considering this placement, within a school setting, an APE specialist needs to adapt to work with the GPE teacher to coordinate activities and equipment. When taken into consideration within

the larger constraints from the symptoms of ASD itself, not only will children with ASD be developmentally behind, which will alter their curriculum within APE, issues, like was experience by each of the participants above, will severely impact the number of goals a child can feasibly complete to mastery during the year. APE specialists need to have an understanding of how to develop a set of goals, typically two or three (as compared to a GPE curriculum of eight to ten goals), that a child can work on to mastery within that given year.

Experienced teachers have far more experience and knowledge to search through to find a good strategy to use for any given situation; pre-service or novice teachers lack this experience and will often have only a poor experience to draw from, which can lead to the 'trial and error' style of behavior management. The author is not suggesting that teacher-preparation programs train teachers to the experience level of very experienced teachers, that would be impossible, however, pre-service teachers need to be given a far more practical knowledge of teaching strategies and practice. Several participants had not knowingly encountered a child with ASD in a classroom, nor were given even a basic set of strategies to use.

Bandura's Self-Efficacy Theory (1977; 1997) suggests judgment of one's self-efficacy is derived from four sources: mastery experiences, vicarious experiences, social persuasion, and physiological responses. There is a great deal training programs can do to tap into these areas in order to improve the confidence of future teachers when working with student with ASD. To tap into building mastery experience, pre-service teachers need to be given the opportunity to have 'real' experiences with children with ASD in which they can be successful (Healy, et al., in press). Taliaferro and colleagues (2015) in an analysis of 98 undergraduate PETE majors, demonstrate a non-significant difference in self-efficacy between student who had prior coursework and experience and student who did not, with the exception of autism. This evidence suggests that there is something unique when working with children with ASD that can not be gained through coursework alone; students need to experience it.

Limitations

While building an important understanding of what factors influence the pre-service APE specialist in teaching motor skills to individuals with ASD and how that interaction exists, there are four limitations to this study. First, the purposeful sample for this study was small (N=4); the small sample is not large enough to truly ensure the transferability of the findings, nor was there experiences or education indicative of the physical education teacher preparation (PETE) programs as a whole. In addition, all the participants were from the same master's program and worked one-on-one with ASD within the same school environment. By having a relatively uniform participant sample, the findings of this study could be limited to this single phenomenon. Future research should seek to recruit individuals from a variety of experiences, educations, and locations.

Second, the participants were all working with individuals with ASD one-on-one and in a mostly secluded setting; findings may have been different had individuals from inclusive or small groups been included. By including those who worked one-on-one, this study was able to look at how the pre-service teachers used or did not use teaching strategies to cope with the behaviors from the child, environment, and instruction situation. It was clear in this analysis, that participants lacked that background experience. Future research, should focus on included participants teaching students in a variety of situations, e.g. small group, APE within GPE, self-inclusive classroom, and a full inclusion GPE environment. In each situation, the influencing factors will be there, but they may exist and co-exist differently. PETE programs should understand how pre-service teachers react to each of those situations, so that they can give them a well-rounded base of knowledge and experience prior to beginning his/her professional career.

Third, participants in this study were selected at the midpoint of his/her APE studies; this could have had an influence on their opinions and perceptions of strategies. Participants within this study showed tremendous growth in the short time being observed and interviewed, but his/her viewpoints may have been different at the beginning of the program. To best understand how these factor exist and which may have more influence over the teacher, participants should be included from the beginning of his/her studies to understand the growth of the individual.

Lastly, interviews and observations occurred over an eight-week span. This study was limited by time and funding, thus the researcher was only able engage with the environment for a short period of time. In order to more effectively build an understanding of how these factors exist in influencing the teacher, more time should be spent in the field observing and interviewing students in multiple settings. Pre-service teachers should be followed for a

longer period of time to gain a fuller wealth of information on the interaction of influences. By gaining a clearer picture of how factors exist, PETE programs can build course content to address the areas that lack.

Conclusion

Through this study, four factors emerged from data to provide a logical understanding of what is influencing pre-service teachers. In this analysis, the behaviors of the child, instructional challenges, physical environment, and personal discernment are all factors that would be expected to emerge for any teacher in any situation, however, this analysis allows for a deeper understanding of how these factors exist in influencing the pre-service teacher. Further study is needed to truly understand this relationship, but this study serves as a starting point for that analysis. Further researcher can start with these factors and focus on understanding what it is about each factor that is influencing the teacher and how does that teacher use the information to proceed with teaching.

It is evident that each of these factors plays a role within the teacher, but how it is used is not clear. The process for discerning information from these factors occurs within completely within the teacher and is not easily observed. However, what is clear in this analysis is that pre-service APE specialists need more guided instruction in strategies for children with ASD and initial experiences in working with these children in a variety of situations. By building a positive, successful experience in working with children with ASD during training, pre-service teachers will have a greater deal of confidence when they become a practicing teacher.

By understanding the relationship of how factors influence each other and exist within when teaching children with ASD, PETE programs can provide directed training to address these areas of need. Training programs have no effect on what the teacher will face in the environment, situation, or child, but can have an effect on the teacher's experience and efficacy toward working with children with ASD. By providing positive and successful experiences, pre-service teachers will be able to be more effective when facing the other influence and be allowed to make a more effectual decision in the teaching process.

References

Al-Farsi, Y. H. Al-Sharbati, M. M., Al-Farsi, O. A., Al-Shafaee, M. S., Brooks, D. R., & Waly, M. I. (2011). Brief report: Prevalence of autistic spectrum disorders in the Sultanate of Oman. *Journal of Autism and Developmental Disorders, 41*(6), 821- 825.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Arlington, VA: American Psychiatric Publishing. http://dx.doi.org/10.1176/appi.books.9780890425596

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215. http://dx.doi.org/10.1037/0033-295X.84.2.191

Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, New Jersey: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman

Bhat, A.N., Landa, R.J., & Galloway, J.C. (2011). Current perspectives on motor functioning in infants, children, and adults with autism spectrum disorder. *Physical Therapy, 91,* 1116-1129. http://dx.doi.org/10.2522/ptj.20100294

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3,* 77-101. http://dx.doi.org/10.1191/1478088706qp063oa

Brinkmann, S., & Kvale, S. (2015). *InterViews: Learning the craft of qualitative research interviewing (3rd ed)*. Los Angeles: SAGE.

Cavell, T.A., & Kelley, M.L. (1992). The measure of adolescent social performance: Development and initial validation. *Journal of Clinical Child Psychology, 21,* 107-114. http://dx.doi.org/10.1207/s15374424jccp2102_2

Centers for Disease Control and Prevention (CDC) (2014). Prevalence of Autism Spectrum Disorders among Children Aged 8 Years – Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2010. *Morbidity and Mortal Weekly Report (MMWR), Vol. 63(2)*.

Connolly, M. (1994). Practicum experiences and journal writing in adapted physical education: Implications for teacher education. *Adapted Physical Activity Quarterly, 11,* 306-328.

Graber, K.C. (1995). The influence of teacher education programs on the beliefs of student teachers: General pedagogical knowledge, pedagogical content knowledge, and teacher education course work. *Journal of Teaching in Physical Education, 14,* 157-178.

Hardin, B. (2005). Physical education teachers' reflections on preparation for inclusion. *The Physical*

Educator, 62(1).
Healy, S., Block, M., & Judge, J. (in press). Preparing adapted physical educators to teach students with Autism: Current practices and future directions? *The Physical Educator, 72(4)*.
Ingersoll, C., Jenkins, J. M., & Lux, K. (2014). Teacher knowledge development in early field experiences. *Journal of Teaching in Physical Education, 33,* 363-382. http://dx.doi.org/10.1123/jtpe.2013-0102
Jeong, M. (2013). Pre-service physical educator attributes and confidence in teaching individuals with disabilities: A preliminary study. *PALAESTRA, 27,* 11-13.
Kelly, L. (Ed.) (2006). *Adapted Physical Education National Standards - APENS* (2nd Edition). Champaign, IL: Human Kinetics.
Kudláček, M., Ješina, O., Šterbová, D., & Sherrill, C. (2008). The nature of work and roles of public school adapted physical educators in the United States. *European Journal of Adapted Physical Activity, 1(2),* 45-55.
Lavay, B., Guthrie, S., & Henderson, H. (2014). The behavior management training and teaching practices of nationally certified adapted physical education (CAPE) teachers. *PALASTRA, 28(1),* 24-31.
Lincoln Y.S., & Guba, E.G. (1985). *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications.
Liu, T., & Breslin, C.M. (2013). Fine and gross motor performance of the MABC-2 by children with autism spectrum disorder and typically developing children. *Research in Autism Spectrum Disorders, 7,* 1244-1249. http://dx.doi.org/10.1016/j.rasd.2013.07.002
MacDonald, M., Lord, C., & Ulrich, D. A. (2014). Motor skills and calibrated autism severity in young children with autism spectrum disorder. *Adapted Physical Activity Quarterly, 31*, 95-105. http://dx.doi.org/10.1123/apaq.2013-0068
Martin, J. J., & Kulinna, P. H. (2005). A social cognitive perspective of physical-activity-related behavior in physical education. *Journal of teaching in physical education, 24,* 265-281.
Obrusnikova, I., & Dillon, S.R. (2011). Challenging situations when teaching children with autism spectrum disorders in general physical education. *Adapted Physical Activity Quarterly, 28,* 113-131.
Patton, M.Q. (2002). *Qualitative Research and Evaluation Methods* (3rd Editions). Thousand Oaks, CA: Sage Publications.
Parner, E. T., Throsen, P., Dixon, G., deKlerk, N., Leonard H., Nassar, N., … & Glasson, E., J. (2011). A comparison of autism prevalence trends in Denmark and Western Autstralia. *Journal of Autism and Developmental Disorders, 41*(12), 1601-1608.
Paula, C. S., Ribeiro, S. H., Fombonne, E. & Mercandante, M. T. (2011). Brief report: Prevalence of percussive developmental disorder in Brazil: A pilot study. *Journal of Autism and Developmental Disorders, 41* (12), 1738-1742.
Piletic, C. K., & Davis, R. (2010). A profile of the introduction to adapted physical education course within undergraduate physical education teacher education programs. *Journal of Research in Health, Physical Education, Recreation, and Dance, 5(2),* 26-32.
McAlister, A. L., Perry, C. L., & Parcel, G. S. (2008). How individuals, environments, and health behavior interact: social learning theory. in K. Glanz, F. M. Lewis, B. K. Rimer, & K. Viswanath (eds.), *Health Behavior and Health Educaiton: Theory Research and Practice*. San Francisco, CA: Jossey-Bass.
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. http://dx.doi.org/10.1177/10883576030180030801
Seidman, I. (1998). *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Science (2nd Ed.)*. New York; Teachers College Press
Sherrill, C. (1998). *Adapted physical activity, recreation, and sport: Cross-disciplinary and lifespan* (5th Edition). Boston, MA: WCB/McGraw-Hill
Staples, K. L., & Reid, G. (2010). Fundamental movement skills and autism spectrum disorders. *Journal of Autism and Developmental Disorders, 40,* 209-217. http://dx.doi.org/10.1007/s10803-009-0854-9
Stroot, S.A., & Oslin, J.L. (1993). Use of instructional statements by pre-service teachers for overhand throwing performance of children. *Journal of Teaching in Physical Education, 13,* 24-45.
Taliaferro, A., Hammond, L., & Wyant, K. (2015). Pre-service physical educators' self-efficacy beliefs toward inclusion: The impact of coursework and practicum. *Adapted Physical Activity Quarterly, 32*, 49-67. http://dx.doi.org/10.1123/apaq.2013-0112
U.S. Department of Education, Office of Special Education and Rehabilitation (2008, March). *26th annual report to congress on the implementation of the individuals with disabilities education act. 1 (1)*, Retrieved from http://ed.gov/about/reports/annual/osep/2003/25th- vol-1-sec-1.pdf
Virues-Ortega, J., Julio, F.M., & Pastor-Barriuso, R. (2013). The TEACCH program for children and adults

with autism: A meta-analysis of intervention studies. *Clinical Psychology Review, 33,* 940-953. http://dx.doi.org/10.1016/j.cpr.2013.07.005
Ward, P. (2014). The role of content knowledge in conceptions of teaching effectiveness in physical education. *Research Quarterly for Exercise and Sport, 84,* 431-440. DOI: 10.1080/02701367.2013.844045
Ward, P. Kim, I., Ko, B., & Li, W. (2015). Effects of improving teachers' content knowledge on teaching and student learning in physical education. *Research Quarterly for Exercise and Sport, 86*(2), 130-140.
Wong, C., Odom, S.L., Hume, K., Cox, A.W., Fettig, A., Kucharczyk, S., … Schultz, T.R. (2013). *Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder.* Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group.
Wright, P. W., & Wright, P. D. (2011). Wrightslaw. Retrieved from http://www.wrightslaw.com/info/pe.index.htm
Young, S. (2012). Concerns of pre-service physical education teachers participating in an early field experience. *The Physical Educator, 69,* 119-135