ADAPTED PHYSICAL EDUCATION SERVICE PROVIDERS' PERCEPTIONS OF SENSORIMOTOR STAGE LEARNERS

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Keywords: adapted physical education service providers, sensorimotor stage learners, instructional practices, perceptions, confidence

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ABSTRACT

Students with severe disabilities at the sensorimotor stage of learning require specialized instructional practices. Limited research into service provider perceptions related to Service Provision and lack of available professional development confound the challenge of implementing effective instructional practices. The investigation used a one-group pretest-posttest research design to investigate current perceptions and self-reported changes in the use of research-based strategies and evidence-based practices after a self-paced asynchronous professional development module developed by the researcher. Data were collected using a questionnaire developed based on the theory of planned behavior which served as the theoretical framework. The pretest-posttest results of ten participants were analyzed to determine relationships and correlations using descriptive and inferential statistics. The results indicated a correlation between confidence in providing Adapted Physical Education services and confidence in being able to fulfill other role responsibilities. The quantitative data results indicated participants who completed the professional development module were more likely to implement routines and hand under hand guidance. Supporting qualitative data results indicated more intentional use of highly effective strategies. Based on the results, APE service providers perceive the value in high quality learning opportunities for students with severe disabilities at the sensorimotor stage of learning.

Keywords: adapted physical education service providers, sensorimotor stage learners, instructional practices, perceptions, confidence

DEDICATION

To John, Jack, Ian, and Oliver,

This dissertation is dedicated to you, my steadfast source of support, love, and encouragement throughout this academic journey. Your belief in my abilities has been a guiding light, propelling me forward even in the face of challenges. Your support has been a constant source of strength and motivation, reminding me of the importance of perseverance and determination.

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CHAPTER 1

Introduction

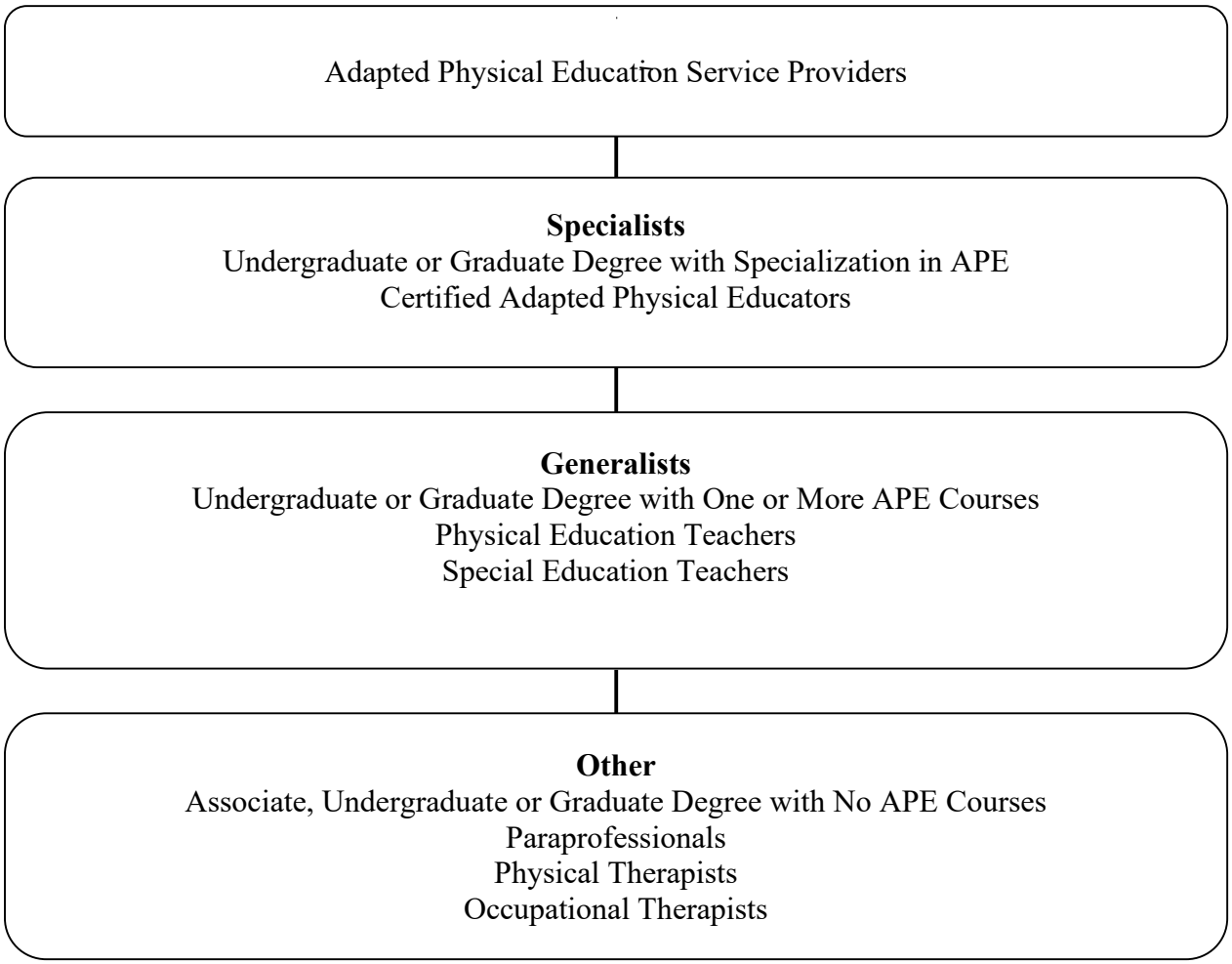
Nationally, Adapted Physical Education (APE) service providers enter the field from various backgrounds and experiences (Kelly & Gansneder, 1998; Obrunsnikova & Kelly, 2009; Wilson, Richards, & Kelly, 2017). Sherrill (2014) identified two groups of professionals that are qualified to provide APE services. First, the term generalist refers to a group of ". . . individuals who have completed one or more courses in APE including a supervised practicum experience with individuals with disabilities" (Sherrill, 2014, p. 13). The second group of specialists are individuals who have "completed undergraduate or graduate degrees with specializations in APE" (Sherrill, 2014, p. 13). Lytle et al. (2010) noted highly qualified adapted physical educators have a general degree in kinesiology with a specialization in APE. The authors further emphasized that completing teacher preparation programs specifically focused on APE provides these educators with ". . . knowledge of physical education content, assessment, individualized educational planning, effective teaching, and evaluation of teaching effectiveness through student achievement" (Lytle, Lavay, & Rizzo, 2010, p. 41). In addition, the researchers stressed the background knowledge and understanding of the variability of the different disabilities they may experience (Lytle et al., 2021).

Some states have developed state-level adapted physical education certifications, endorsements, licenses, and additional degrees (Sherrill, 2014; Wilson et. al., 2017). For instance, according to the Texas Register (2020) APE service providers' roles in Texas can be filled by individuals who hold various levels of certification in physical education. In addition, an individual with a special education certification can also be assigned to this role. However, the Texas Education Code (TEC, 2021) explicitly states the role ". . . requires necessary skills

and knowledge in adaptive[1] physical education" (p. 2). Public agencies are obligated to confirm evidence of the necessary knowledge and skills through coursework transcripts and professional development records (TEC, 2021).

Figure 1

Adapted Physical Education Service Providers



Note. Figure 1 identifies some professionals providing Adapted Physical Education services (Sherrill, 2014; TEC, 2021; Texas Register, 2020).

[1] adapted (Sherrill, 2014, p. 8)

With the many existing disabilities, there is the necessity to seek and find the information needed to provide effective programming for students with disabilities (Lytle et al., 2021). Generally, APE teachers reported pre-service course content is sufficient for teaching students with mild disabilities (Hodge et al., 2009). However, course content may not prepare APE teachers to work with students with severe disabilities (Sato & Haegele, 2017a). For example, Hardin (2005) reported participants commented that teaching students with disabilities was "virtually ignored (p. 52)" in teacher preparation coursework other than the single adapted physical education course. This deficiency in course content can lead to challenges with providing meaningful instruction, avoidance of interaction with various disability levels, negative attitudes, lack of confidence, and feelings of failure and frustration (Hodge et al., 2009; Sato & Haegele, 2017a; Sherrill, 2014). When pre-service APE service providers are not provided with the opportunity to build knowledge and engage in experiences with students with severe disabilities, these service providers are not able to develop their confidence (personal assurance of their abilities) in their instructional practices (Dierking & Fox, 2012).

Students with severe disabilities (SD) are perceived as a more challenging population for adapted physical education instruction (Hodge et al., 2009). According to the Individuals with Disabilities Education Improvement Act (2004) students with visual, hearing, visual and hearing, and significant cognitive impairments are defined as having "low incidence disabilities." Students with low incidence disabilities often have sensory disabilities (i.e., blindness, low vision, deafness, hearing loss, or deaf blindness; Maietta & Tafuri, 2022). When students have multiple impairments such as an intellectual disability and a visual impairment, these students are considered eligible to receive special education services within the Multiple Disability category (Individuals with Disabilities Education Improvement Act [IDEIA], 2004). For the

purpose of this investigation, students with severe disabilities (SD) will be defined as individuals with multiple impairments, including cognitive, visual, hearing, orthopedic, and communication impairments with medical complications who demonstrate limited environmental awareness and voluntary movement (Jansma, 1999; Sherill, 2014; Vogler et al., 2000).

Specifically, through observations of infants and toddlers, Jean Piaget was able to determine that during the sensorimotor stage of learning infant's reflexes and senses develop and motor function improves (Rowland, 2012; Smith et.al, 2020). Infants are able to gain more knowledge about their world as their sensory, motor, and cognitive skills develop (Rowland, 2012; Smith et.al, 2020). Students with SD can be any age, and many require instructional techniques similar to techniques used for infants and toddlers (Sherrill, 2014; Smith et.al, 2020). Many of these students with SD are considered to be in the sensorimotor stage of learning (Smith & Chambers, 2023). Therefore, the focus of this dissertation is on current APE service providers including those who are considered specialists and generalists that provide services to students with SD which includes sensorimotor stage learners. Additionally, instructional strategies based on Piaget's Theory of Cognitive Development will be explained within an asynchronous professional development module (see Table 1).

Table 1

Relation and Description of Theories and Model

Piaget's Theory of Cognitive Development	Guskey's Model of Teacher Change	Theory of Planned Behavior
Related to the Asynchronous Self-paced Professional Development Module	Related to the Intervention	Guiding Framework for the Present Study and Questionnaire
Describes learning processes for 4 stages of cognitive and physical development that occur simultaneously. The focus of the present investigation is the initial level, which is the sensorimotor stage of learning (Rowland, 2012).	Describes the process of changing teachers' attitudes and beliefs. When teachers observe evidence of changes in student outcomes, teachers believe student success can be attributed to the newly learned practices presented in the professional development (Guskey, 2002).	Describes the factors (i.e., attitudes, subjective norm, perceived behavioral control, behavior beliefs, normative beliefs, control beliefs, intentions, behaviors) that influence an individual's attempt to perform a behavior (Ajzen, 1985).

Note. Description of theories and model and how each relates to the investigation.

Professional Development Learning Module

A self-paced asynchronous professional development learning module was developed by the researcher instructionally aligned with research-based strategies and evidence-based practices recommended in the research literature (Smith & Chambers, 2023). The self-paced asynchronous professional development learning module developed by the researcher was determined to have appropriate content and to be valid for the intended purpose and population by a panel of three experts. The professional development module was a digital guided practice workbook with embedded videos, student scenarios, instructional resources, and descriptive information about students with severe disabilities at the sensorimotor stage of learning. This process is described in Chapter 3. The asynchronous professional development model was developed for this investigation because it reflects the current trend in PD. This model is also more accessible for

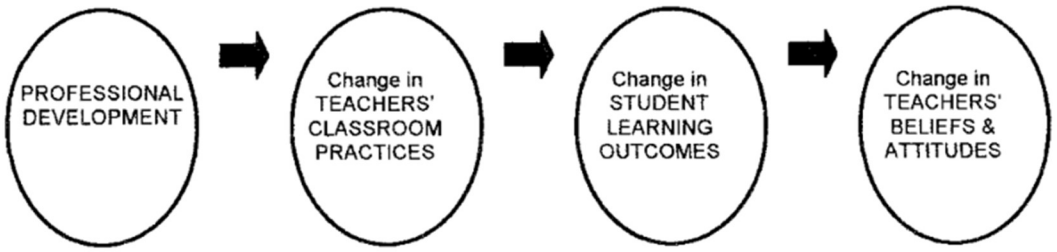
APE service providers because APE service providers can choose when and where to engage in professional learning (Marroquin & Swift, 2023).

Model of Teacher Change

Guskey (2002) developed the 'Model of Teacher Change' (see Figure 2), to explain the process of professional development's role in teacher change. While many believe changes occur because teacher's beliefs and attitudes change, Guskey (2002) suggested changes in teachers' perceptions depend on student learning outcomes. Positive student learning outcomes are related to the instruction that is provided. When student learning outcomes improve, it is typically related to a change in instructional practices (Guskey, 2002). In regard to professional development, Guskey (2002) highlights that teacher perceptions do not change because of professional development specifically. Teacher perceptions change when newly learned strategies and practices are implemented and result in improved student learning outcomes (Guskey, 2002; see Table 1).

Figure 2

A Model of Teacher Change (Guskey, 2002, p. 383)



Perception is defined as the process of becoming aware through engagement in experiential learning which supports interpretation into meaningful knowledge for coordinated action (Douglas, Franks, & Krause, 2019). Smith (2001) emphasized that " . . . perceptions are

definite events at definite instants and are then over" (p. 285). Participants were provided with the asynchronous self-paced professional development module focused on instructional strategies for students at the sensorimotor stage of learning. This learning experience was developed to provide participants with the relevant instructional information and participants were encouraged to apply this new knowledge to their daily practice. Participants were asked to complete a questionnaire before and after the asynchronous self-paced professional development module. This questionnaire was developed based on the theory of planned behavior (see Table 1). The theory of planned behavior (TpB) guides researchers who seek to understand the factors that influence an individual's beliefs (Sherrill, 2014, p. 139). The researcher explored the APE service providers' self-reported changes in perceptions regarding students at the sensorimotor stage of learning to gain insight into the beliefs regarding these learners. Therefore, data collected before and after the professional development was used to describe APE service providers' perceptions.

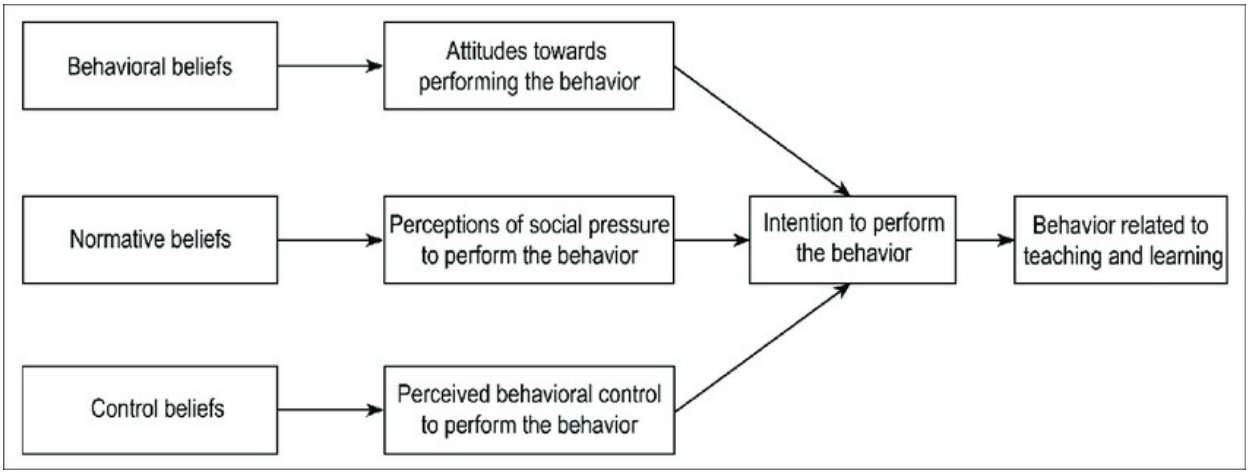
Theoretical Framework

The term theory ". . . often refers to a generalization or set of generalizations that are used systematically to explain some phenomenon" (Johnson & Christenson, 2014, p. 19). Theoretical frameworks guide research (Johnson & Christenson, 2014). Sherrill (2014) discussed the reason to ". . . study attitudes is to better understand the link between attitudes and behaviors" (p. 183). The author elucidates that ". . . valid measures of attitude can be used as predictors of teacher behaviors" (Sherrill, 2014, p. 183). According to Ajzen (1985) an individual's behavior intention is determined by two belief systems ". . . personal attitude toward the behavior and subject norm" (p. 12). However, the theory of reasoned action encounters application limitations when predicting actual behavior because the behavior ". . . must be under volitional control" (p. 18).

The theory of planned behavior (see Figure 3) remedies this limitation by adding a third belief system called perceived behavioral control (Sherrill, 2014). The theory of planned behavior has been used in many studies focused on Adapted Physical Education service providers (Akuffo & Hodge, 2008; Hodge, Tannehill, et al., 2003; Hodge, Ammah, et al., 2004). The current investigation is guided by the theoretical framework of theory of planned behavior to investigate attitude-behavior linked components (Sherrill, 2014, p. 139).

Figure 3

Theory of Planned Behavior



Note. Schematic representation of the theory of planned behavior applied to teachers' behavior. From "Advantages and Disadvantages of Modeling Beliefs by Single Item and Scale Models in the Context of the Theory of Planned Behavior" (Heuckmann et al., 2019; p. 3).

Purpose

There are two purposes of this investigation. The first purpose of the investigation is to examine the APE service providers' perceptions related to providing APE services for students with severe disabilities at the sensorimotor stage of learning. Second, the self-reported use of instructional practices and strategies used with students with severe disabilities at the sensorimotor stage of learning before and after a self-paced asynchronous professional

development learning module will be examined to determine the extent of alignment with research-based strategies (researchers can demonstrate the practice as being effective; Cook & Cook, 2011) and evidence-based practices (effective practices supported by multiple high-quality studies; Cook & Cook, 2011) recommended by supported research.

Research Questions

1. What preparation opportunities have APE service providers had to develop knowledge to provide services to students with severe disabilities at the sensorimotor stage of learning?
2. What are the self-reported changes in APE service providers' perceptions toward students at the sensorimotor stage of learning following an asynchronous professional development module focused on sensorimotor stage instructional strategies?
3. What are the changes in APE service providers' self-reported level of confidence after participation in an asynchronous professional development learning module?
4. How will APE service providers self-reported implementation of highly effective (Smith et.al, 2020) instructional strategies change after completing an asynchronous professional development learning module?

Rationale

Obrusnikova and Kelly (2009) provided their definition of adapted physical education as ". . . physical education that has been adapted or modified so that it is appropriate for both students with and without disabilities" (p. 738). While this definition provides some guidance, it does not necessarily provide the distinction needed to adhere to the definition of special education in the Education for All Handicapped Children Act (EAHCA). The definition of special education in the original statute, EAHCA, and in the following reauthorizations states ". . . specially designed instruction, at no cost to parents to meet the unique needs of a child with

a disability, including . . . instruction in physical education" (PL 94-142, 1975). This definition emphasizes the need for individualized instruction specific to the "unique" needs of the child with a disability (PL 94-142, 1975).

Over time the EAHCA evolved into the Individuals with Disabilities Education Act (IDEA) in 1990. Through ongoing amendments (Individuals with Disabilities Education Improvement Act, 2004), the definition of physical education was refined and expanded. These refinements broadened the scope to include the development of ". . . physical and motor fitness, fundamental motor skills and patterns, skills in aquatics and dance, and skills in individual and group games and sports" (Code of Federal Regulations, 2023). Additionally, the definition of physical education was expanded to include ". . . special physical education, adapted physical education, movement education, and motor development" (Code of Federal Regulations, 2023). Furthermore, specially designed instruction continued to be mandated to meet the unique needs of the student (Yell et al., 2021). This definition was refined in IDEA to include assurance of ". . . access to the general curriculum" (Yell et al., 2021, p. 71).

Often APE service providers feel a higher level of perceived confidence working with students who have mild disabilities (Hodge et al., 2009). For most educators, confidence in teaching is related to their content knowledge and practicum experiences (Curtner-Smith, 2001). As pre-service teachers have more experience with content instruction, they can increase their pedagogical knowledge (Brian & Taunton, 2018). This knowledge and experience can be applied when teaching students with varying degrees of disabilities. The more positive experiences the APE service provider has in providing instruction, the more likely the APE service provider will be confident in their instruction (Ajzen, 1985). While educational background determines whether a service provider is fully certified, the educational background and experiences

distinguish an individual as highly qualified (Lytle et. al., 2010). According to Lytle et al. (2010) fully certified and highly qualified APE service providers have content knowledge in the area of physical education and have comprehensive knowledge of special education.

Furthermore, these APE providers can apply their knowledge and design effective educational experiences for student skill development (Lytle et al., 2010). Educational background and experiences, both with providing services and meeting APE service provider role expectations, determine whether a service provider is considered an expert or a novice (Solmon & Lee, 1991). However, when novice or pre-service and expert or in-service APE service providers are not provided with a foundation of needed training, they often feel unprepared and less confident about their instruction (Hodge et al., 2009; Sato & Haegele, 2017a).

Federal Mandate Implications for APE Service Providers

Regardless of educational background or experience, APE service providers must be able to competently fulfill the obligations of the APE role as mandated by IDEA (Akuffo & Hodge, 2008; IDEIA, 2004; Yell et al., 2021). APE service providers are required to complete evaluations, including formal and informal evaluations, as part of the multidisciplinary evaluation team (IDEIA, 2004; Yell et al., 2021). According to IDEIA regulations, evaluations must adhere to the guidelines provided which includes selecting the most appropriate evaluation instruments based on the strengths and weaknesses of the student (Code of Federal Regulations, 2023). The APE service provider must be able to use the evaluation data, as well as, data collected through observations, interviews, and interactions with the student to develop a statement of Present Level of Academic Achievement and Functional Performance (PLAAFP) within the students' individualized education program (IDEIA, 2004; Yell et al., 2021).

The student's Individual Education Program (IEP) is a written statement that is developed, reviewed, and revised at least annually that includes all programming considerations for the student (Code of Federal Regulations, 2023; Yell et al., 2021). APE service providers formulate goals and objectives based on student needs to focus instruction for skill development (Akuffo & Hodge, 2008; IDEIA, 2004; Yell et al., 2021). This information is provided to the IEP Team which includes the student's family, an administrator, a teacher with knowledge of content and the student, a special education teacher with knowledge of the student, assessment personnel, instructional and related service providers, and the student when appropriate. Once the IEP has been accepted by the committee, the APE service provider must be able to monitor and document progress on the goals and objectives through an adequate data collection method or system (IDEIA, 2004; Yell et al., 2021).

According to IDEIA (Code of Federal Regulations, 2023), APE service providers must be able to provide 'specially designed instruction' in physical education and it ". . . must be made available to all eligible students with disabilities" (Code of Federal Regulations, 2023; Zhang et al., 2000, p. 297). When considering specially designed instruction, APE service providers should be competent in ". . . adapting the content, methodology, or delivery of instruction" (Code of Federal Regulations, 2023, p. 20). APE service provider specialized knowledge includes components such as motor behavior, exercise science, human development, instructional design and planning, and understanding of unique attributes of learners (Hodge et al, 2012). This knowledge contributes to the abilities of the APE service provider to provide and support specially designed instruction (Hodge et al, 2012).

Specially designed instruction can include providing explicit instruction on prerequisite foundational skills with varying levels of prompts using modified equipment. For example,

students learning to catch can be provided opportunities to improve visual tracking with suspended or self-tossed objects of various weights and sizes (Solmon & Lee, 1991). These intervention strategies should be individualized to the needs of the student rather than a general accommodation to core instruction. This intervention is necessary because the student is not responding to core instruction. Therefore, accommodations will not be enough to support meaningful skill development (Rodgers et al., 2021).

The APE service provider is additionally responsible for collecting data for IEP goals and objectives in order to provide progress report information in accordance with the IDEIA (Akuffo & Hodge, 2008; Yell et al., 2021). Yell et al. (2021) highlight the importance of monitoring progress with a system of data collection which documents teacher observations. Additionally, the IEP must include a baseline of student present level of academic achievement and functional performance (PLAAFP), and the data collection should be compared to this baseline in order to determine meaningful progress (Yell et al., 2021). APE service providers are considered part of the IEP committee and have responsibilities in that role. To be an effective member of the committee, APE teachers need to communicate and collaborate with other members of the IEP Team. This committee includes the student's parents, general education teachers, special education teachers, and other instructional and related service providers. The IEP committee members are responsible for attending annual IEP meetings, as well as, IEP meetings requested throughout the school year.

Significance of Study

The limited research into APE service providers' perceptions about providing service for students with severe disabilities (SD), specifically students at the sensorimotor stage of learning (Hodge et al., 2009: Sato & Haegele, 2017a) and the awareness of the challenge of instruction

for this population (Hodge et al., 2009) support the need for this research. APE service providers are responsible for providing high-quality instruction to all eligible students for their unique needs (Individuals with Disabilities Education Improvement Act, 2004). The investigator examined the self-reported learning following an asynchronous self-paced professional development module for current APE service providers and the change to the current state of their instructional practices and perceptions related to students with severe disabilities at the sensorimotor stage of learning. Ultimately, the investigator designed the investigation to support current relevant literature that highlights the current state of teacher preparation programs for future APE service providers. Further, the investigator developed recommendations for teacher preparation programs and ongoing professional development opportunities (Hodge et al., 2009; Sato & Haegele, 2017a).

Delimitations

1. The participants (n = 29) were Adapted Physical Education service providers who currently provide APE services within the state of Texas.
2. The APE instruction provided by the APE service provider directly with the student is referred to as direct instruction.
3. The statements in the questionnaire based on the theory of planned behavior were focused on characteristics of students at the sensorimotor stage of learning.
4. The investigation was conducted within an 8-week time period.
5. The professional development module was asynchronous and self-paced.

Limitations

1. The investigation results may not generalize to APE service providers in other states due to the inconsistency of who is eligible to provide APE services across states.

2. The research design, including a questionnaire as the primary data collection instrument, may have been influenced by participants' recall and self-awareness.
3. The researcher had access to APE service providers who were current members of a list-serv which may not include generalists and other professionals providing the APE service. Therefore, the sample was developed using convenience and snowball sampling strategies which could impact generalization of the findings.
4. The amount of time available for participants to engage in the self-paced asynchronous professional development module could have been limited due to the requirements of their current employment as well as daily life activities (e.g., workload demands, family obligations).
5. The results of the investigation were based on participants' self-reported perceptions.

Definition of Terms

For the purpose of this investigation, the following terms were defined:

1. **Adapted Physical Education (APE)**: APE is specially designed instruction to meet the needs of an eligible child through adapting or modifying the content, methodology, or delivery of instruction to address the unique needs of the child that result from the child's disability and to ensure access of the child to the general curriculum (IDEIA, 2004). APE is the term used to describe services delivered to school-aged individuals from birth through age 21. Services are provided wherever they are needed: (a) in general or mainstream settings, (b) in specially designed classes or programs, and (c) in one-to-one and small group accommodations. APE is a service delivery system, not a placement (Sherrill, 2014).

2. **Adapted Physical Education Service Provider**: Individuals employed or used to provide adapted physical education services (Sherrill, 2014). In Texas, this includes other licensed professionals under the scope of practice of the specific license held (TEC, 2020).
3. **Evidence-Based Practices**: "Instructional techniques that meet prescribed criteria related to the research design, quality, quantity, and effect size of supporting research" (Cook & Cook, 2011).
4. **Generalists**: APE service providers who have completed one or more courses in APE which includes a supervised practicum (Sherrill, 2014).
5. **Hearing Impairment**: "An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's education performance but that is not included under the definition of deafness" (Code of Federal Regulations, 2023, p. 13).
6. **Instructional Practices**: Instructional procedures or methods that are systematically implemented to achieve learning outcomes (Saleh & Jing, 2020).
7. **Intellectual Disability**: "Significant subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance" (Code of Federal Regulations, 2023, p. 13).
8. **Low Incidence Disability**: Refers to individuals who have: (a) visual or hearing impairment, or simultaneous visual and hearing impairments, (b) a significant cognitive impairment, or (c) an impairment for which a small number of personnel with highly specialized skills and knowledge are needed (IDEIA, 2004).

9. **Multiple Disabilities**: "Refers to concomitant impairments (e.g., intellectual disability-blindness, intellectual disability-orthopedic impairment), the combination causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments" (Code of Federal Regulations, 2023, p. 13).
10. **Orthopedic Impairment**: "An orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by: (a) congenital anomaly, (b) impairments caused by disease (e.g., poliomyelitis, bone tuberculosis), and (c) impairments from other causes (e.g., cerebral palsy, amputations, fractures or burns that cause contractures" [Code of Federal Regulations, 2023, p. 13]).
11. **Physical Education**: Instruction in: (a) physical and motor fitness, (b) fundamental motor skills and patterns, and (c) skills in aquatics, dance, and individual and group games and sports including intramural and lifetime sports (IDEIA, 2004).
12. **Professional Development**: Activities that are an integral part of school and local education agency strategies for providing educators with the knowledge and skills necessary to enable students to succeed in a well-rounded education and to meet the challenging state and academic standards (Every Student Succeeds Act, 2015).
13. **Research-Based Strategies**: Research demonstrates the strategy or practice as being effective (Cook & Cook, 2011).
14. **Sensorimotor Stage of Learning**: This is the earliest stage (birth to 2 years) in Jean Piaget's theory of cognitive development. Learning occurs through a child's sensory and motor interactions within their physical environment (Smith & Chambers, 2023).

15. **Severe Disability**: Refers to individuals with multiple impairments, including cognitive, visual, hearing, orthopedic, and communication impairments with medical complications who demonstrate limited environmental awareness and voluntary movement (Jansma, 1999; Sherrill, 2014; Vogler et al., 2000).
16. **Specialists**: APE service providers who have completed undergraduate or graduate degrees with specializations in APE (Sherrill, 2014).
17. **Speech or language impairment**: "A communication disorder (e.g., stuttering, impaired articulation, voice impairment) that adversely affects a child's educational performance" (Code of Federal Regulations, 2023, p. 13).
18. **Vision Impairment**: "An impairment in vision that, even with correction, adversely affects a child's education performance" (Code of Federal Regulations, 2023, p. 13).

Summary

All students must have access to and instruction in physical education (PL 94-142, 1975). APE service providers support access to the physical education curriculum and provide individualized instruction required to support the unique needs of students with disabilities. Nationally, specialists and generalists provide APE services for students with various disabilities. These individuals have varied educational backgrounds with the distinction between the two groups based on the level of college degree or number of courses in APE. States (i.e., California, Texas) further define APE service providers through state level certifications, licensures, and endorsements. With the variance of state level qualifications for APE service providers, other professionals such as special education teachers and physical therapists may be eligible to provide APE services. APE service providers teach students with a range of disabilities and at various levels of cognitive and motor abilities. Students with severe disabilities, considered

low-incidence disabilities, including those at the sensorimotor stage of learning, require service providers with highly specialized skills and knowledge to provide specially designed instruction (IDEIA, 2004).

The purposes of this investigation are to examine the self-reported learning following an asynchronous professional development module on APE service providers' perceptions when teaching students at the sensorimotor stage of learning and to investigate the self-report use of highly effective (Smith et.al, 2020) instructional strategies, research-based strategies, and evidence-based practices presented in the professional development module. The highly effective instructional strategies presented in the professional development module are based on the Sensing and Learning program validated through case investigation research (Smith & Chambers, 2023; Smith et.al, 2020). The investigation is guided by four research questions. In the Chapter 2, relevant literature will be reviewed. Methods for the intervention and data analysis will be described in Chapter 3. The remaining Chapters 4 and 5 will provide a description of the data collected and a discussion of the results.

CHAPTER 2

Review of Literature

The review of literature provides a description of the current trends in Adapted Physical Education (APE) role expectations, instructional practices, and benefits of pre-service training and in-service professional development. Further, research into the challenges related to perceived confidence will be investigated. Federal mandates have increased the prevalence of students with severe disabilities (SD) in physical education classes. APE service providers' perceptions regarding students with SD at the sensorimotor stage of learning will be reviewed. Finally, a highly effective research based strategy and evidence-based practices used in APE and for students in the sensorimotor level stage of learning will be explored.

Role Expectations

Akuffo and Hodge (2008) cited multiple investigators supporting "commonly held" roles through which instruction could be provided. Students with disabilities who have been evaluated and determined to need specially designed instruction to receive adapted physical education (APE) through an instructional service model (Sherrill, 2014). However, due to the broad definition provided by Education for All Handicapped Children Act (EAHCA, 1975) and Individuals with Disabilities Education Improvement Act (IDEIA, 2004), how those services are provided and by whom is unclear (Kelly & Gansneder, 1998; Wilson et al., 2017). Kelly and Gansneder (1998) divided this instruction into two main categories: direct and indirect. For the purposes of this investigation, direct instruction is considered from the perspective of the instruction being provided by the APE service provider. The direct instruction provided by APE service providers focuses on the unique needs of the student, including considerations (e.g., state standards, physical education curriculum implemented with general education peers, motor

development, adaptive sports). Indirect instruction includes the same considerations; however, the APE service provider is consults and collaborates with other staff who provide the direct instruction (Grenier, 2011; Hodge et al, 2012).

Direct instruction roles can include teaching a self-contained physical education class at a designated campus or school for students who are not enrolled in a general education physical education class (Yell et al., 2021). APE service providers can co-teach a physical education class with a Physical education teacher that includes students with and without disabilities. APE service providers can be responsible for multiple campuses or schools where they provide instruction to specific eligible students focused directly on students' Individual Education Program (IEP; Yell et al., 2021). Due to the various Service Provision models, APE service providers' roles can include responsibilities for implementing instruction to the individualized goals and objectives within the context of a classroom environment. The APE service provider may be responsible for developing and implementing class activities. These activities may include adherence to state standards and providing grades based on mastery of the standards. The APE service provider may be responsible for overseeing instruction and providing grades for students who are not eligible for APE services within the context of the class.

A commonly held role expectation is that APE service providers must plan and implement lessons to facilitate learning (Yell et al., 2021). An investigation by Akuffo and Hodge (2008) documented that APE service providers reported their ". . . primary obligation was to teach students with varying disabilities" (p. 253). The participants all indicated that planning for instruction is important. However, all participants reported they did not routinely develop lesson plans. Solmon and Lee (1991) provided insight into the lesson planning of novice and expert APE service providers. When comparing the lesson plans of each group, the experts

included critical components, including assessment of skills, task analysis, and progression of skills. The experts tended to implement a wider variety of activities, levels, and modified equipment more consistently. The lesson plans designed by the experts ensured more active participation, which supports skill development (Solmon & Lee, 1991).

Instructional Practices

It is critical for APE service providers to understand physical and motor skill development and implement developmentally appropriate practices (Hodge et al., 2012, p. 79). Knowledge of movement patterns and awareness of possible factors that impact motor performance is necessary to provide meaningful instruction. Additionally, it is important when designing activities to match the movement pattern to the motor skills goal to ensure purposeful practice of the targeted skill (Hodge et al., 2012).

In addition, APE service providers can support special education classroom staff, Physical education teachers, and other staff through consultation to ensure instruction is provided directly related to the student's IEP (Akuffo & Hodge, 2008; McNamara & Pan, 2020). Consultation can be provided in many ways. The APE service provider can provide lesson plans and modified activities to promote inclusion. Activities and classroom routines can be individualized for specific students with disabilities. Additionally, APE service providers can provide modified equipment, such as beeping balls, for students with visual impairments. APE service providers can provide training and guidance to classroom staff, including paraprofessionals, through modeling instructional strategies.

Further, Heikinaro-Johansson et al. (1995) developed and investigated a model for APE consultation, including many of these options (e.g., providing lesson plans, modification of activities, providing modified equipment, providing training). The investigation highlighted the

benefits of consultation and an additional role many APE service providers experience, which is that of a ". . . counselor" (p. 29). Many times, classroom staff need emotional support for frustrations and lack of confidence. APE service providers' roles may include variations of these commonly held responsibilities as well as any combination of the roles.

Benefits of Professional Preparation

Preservice Training

Curtner-Smith (2001) used a single-participant case study approach with comprehensive interviews that demonstrated the positive impact of pre-service teacher coursework (work performed by students for the purpose of learning) and in-service training (the process of learning the skills needed to do the job). The participant explained participation in the methods course and student teaching provided ". . . the practical skills and knowledge that goes into being a successful physical education teacher" (p. 95). Further, Hodge et al. (2003) reported similar findings through the authors' study of 10 participants. Participants had the opportunity to work with students with and without disabilities over the course of 8 weeks. Through reflective journaling, the participants emphasized the initial apprehension they felt regarding working with students with disabilities (Hodge et al., 2003, p. 396). Throughout the practicum experience, the participants were able to increase their skills in modifying and adapting activities within their lesson plans. It was reported learning these specific pedagogical skills "enhanced their self-confidence in working with students with and without disabilities" (Hodge et al., 2003, p. 397). Similarly, Layne and Blasingame (2018) highlighted that when participants in the authors' study were provided the opportunity to work one on one with students with severe disabilities (SD), the participants improved personal ". . . teaching abilities" (p. 694).

Furthermore, Brian and Taunton (2018) provided evidence through their study that

pre-service teachers benefit from experiences of teaching fundamental motor skills. The authors further implied that pre-service teachers need to have enough direct instruction experiences with fundamental motor skills in order to demonstrate mastery of the pedagogical knowledge. These experiences should be provided prior to the pre-service teacher attempting to provide indirect or direct instruction (Brian & Taunton, 2013, p.231). Similarly, Sato and Haegele (2017a) conducted a study using an exploratory case study method with interviews of participants in an APE graduate program at universities. The study documented the APE graduate program participants' practicum experiences, specifically working with students with severe disabilities. Participants detailed various experiences, including the ". . . reality shock" of some student behaviors (Sato & Haegele, 2017a, p. 207). Through the practicum experience, participants had the opportunity for ". . . hands-on" support from mentor APE teachers, who were considered experts, as well as other special education teachers (Sato & Haegele, 2017a, p. 206). This supported the participants' learning and contributed to their future preparation. APE service provider preparation can prevent ". . . abandoning instructional strategies" in response to the reality shock of working with students with SD (Sato & Haegele, 2017a, p.208). Additionally, teacher attitudes and perceptions of providing instruction for students with SD increase when provided APE coursework with hands-on experiences (Ammah & Hodge, 2005).

In addition, McNamara et al. (2022) interviewed professors instructing introductory APE courses for pre-service physical education teachers. The participants emphasized the rationale for including experiences with students with disabilities to establish an empathetic understanding of the possible challenges. Similarly, to the study conducted by Sato and Haegele (2017a), the participants highlighted the supportive environment provided by the hands-on practicum experience. Interestingly, a participant in the study emphasized that even with the coursework

and hands-on experiences, they believed the pre-service physical education teachers were ". . . not qualified to teach APE" (Sato & Haegele, 2017a, p. 550). This insight supports the substantial research indicating the need for additional coursework requirements to better prepare physical education teachers who could become APE service providers (Hodge et al., 2009, Sato & Haegele, 2017a).

In-Service Professional Development

Practicing APE service providers benefit from continuing education opportunities to supplement pre-service coursework and training limitations, specifically when teaching challenging students. Hodge et al. (2009) acknowledged that ". . . ongoing professional development would enhance teachers' overall motivation and teaching effectiveness" (p. 416). With the ambiguous roles of APE service providers, it may be difficult to promote teacher accountability for instruction. Ongoing professional development focused on skill development for the diversity of students (Jeong et al., 2021) eligible for APE services, supports accountability for APE service provider practices (Akuffo & Hodge, 2008).

Teachers who seek professional informational resources such as physical education literature perceive more success in providing instruction (Hodge et al., 2004). Sato and Haegele (2017b) investigated the experiences of physical education teachers enrolled in an online APE course as professional development. Participants reported improvement in the quality of their APE services as a result of the professional development (Sato & Haegele, 2017b, p. 627). Professional development provides participants with the opportunity to better understand their professional roles and responsibilities (Sato & Haegele, 2017b). Additionally, professional development supports participants' personal growth as leaders and mentors (Sato & Haegele, 2017b). As stated by researchers in multiple studies, there is a continued need for APE service

provider preparation to provide informed instruction (Akuffo & Hodge, 2008; Ammah & Hodge, 2005; Hodge et. al., 2003). APE service providers specifically see a need for better preparation or in-service development focused on motor development, unique attributes of learners, and teaching strategies (Kelly & Gansneder, 1998).

Challenges Related to Limited Preparation

When not provided with needed training, APE service providers feel unprepared (Hodge et al., 2004; Hodge et al., 2009; Sato & Haegele, 2017a;) and question their quality of instruction (LaMaster et al., 1998). APE service providers have difficulty finding and using resources (Sato & Haegele, 2017a). Additionally, they have difficulty individualizing instruction by providing adaptations and modifications (Hodge et al., 2004; Hodge et al., 2009). For example, a participant in a study by Hodge et al. (2004) that investigated nine general PE teachers teaching 80 students with mild to severe disabilities reported the realization that a student with physical impairments might have difficulty using a racket. However, the teacher discussed the challenge of knowing how to adapt the equipment, citing that a larger racket was not beneficial (Hodge et al., 2004). These challenges impact student outcomes as experienced by highly effective physical education teachers in the study conducted by LaMaster et al. (1998). These teachers reported concerns about the "widening of the gap" between the students with disabilities and their peers without disabilities (LaMaster et al., 1998, p. 73).

The participants in Sato and Haegele's (2017a) study reported college course content was proficient for teaching students with mild disabilities but lacked in teaching students with severe disabilities (p. 206). Additionally, McNamara et al. (2022) attributed this phenomenon to the extensive content that must be covered in what is typically one course does not allow for the depth of instruction needed (p. 554). Further, Hodge et al. (2009) documented teachers'

perceptions that their difficulties in providing instruction were related to the severity of the student's disabilities (p. 417). Lack of training can result in an increase in using ". . . survival-like practices and quick fixes" rather than implementing highly effective instructional strategies (Sato & Haegele, 2017a, p. 207). Additionally, teachers may rely on ". . . trial and error rather than evidence based pedagogy" (McNamara et al., 2022, p. 556). APE service providers teaching self-contained classes may fall back into teaching the class as they would a physical education class without individualization of instruction (Webster, 1993).

Students with severe disabilities at the sensorimotor stage learners in particular, may not be provided with the direct instruction needed due to a lack of training. While students functioning at the sensorimotor learning stage should not be excluded from other activities, many activities do not incorporate the highly effective instructional strategies needed for learning (Smith & Chambers, 2023). These students are provided activities in which they are only able to participate passively (Hodge et al., 2004). APE service providers who use activities rather than routines are not providing effective instruction for learning (Smith & Chambers, 2023).

Factors Impacting Perceived Level of Confidence

Whether it be through coursework, practicum experience, or professional development, if teachers feel satisfied with their training, they report higher levels of confidence when working with students with severe disabilities (Jeong et al., 2021; Layne & Blasingame, 2018). Additionally, when APE service providers experience more success when working with students with severe disabilities, they, in turn, feel more confident (Jeong et al., 2021; Layne & Blasingame, 2018). APE service providers who are confident when providing instruction for students at the sensorimotor stage use highly effective instructional strategies. This confidence is developed when APE service providers experience improved student outcomes as a result of

implementing highly effective strategies (Guskey, 2002). Conversely, when APE service providers experience challenges such as inadequate professional preparation, the inability to provide instructional services with confidence is increased (Ammah & Hodge, 2005: Hodge et al., 2009). This lack of preparation and training impacts the effectiveness of adaptations and modifications implemented, which affects teachers' confidence in their instructional abilities (Ammah & Hodge, 2005; Layne & Blasingame, 2018).

With the passing of EAHCA, students with disabilities were mandated to be included in physical education classes. The reauthorization through IDEIA further prioritized their inclusion, mandating ". . . access to physical education to the same extent as the nondisabled peers" (Yell et al., 2021, p. 71). Over time, physical education has become a primary setting for inclusion. Teachers and parents have realized the importance of physical activity, and the cooperative nature of the setting supports opportunities for socialization. While many students with mild disabilities are able to participate in physical education independently, many students with moderate to severe disabilities require specially designed instruction (Yell et al., 2021). Most students receive their physical education instruction through a combination of physical education placement and adapted physical education instructional services (Kelly & Gansneder, 1998). When current APE service providers were asked for details regarding the types of students, they provided services for, generally, most reported teaching roughly the same number of students in each level (mild, moderate, and severe) of disability (Kelly & Gansneder, 1998). The inclusion of students with disabilities has impacted instruction in physical education in many ways. Researchers have documented many approaches and models that have been beneficial for providing meaningful instruction to most students with disabilities (Heikinaro-Johansson et al., 1995; Yell et al., 2021). However, researchers have suggested a perception that teaching students

with SD continues to be a challenge (Hodge et al., 2009; Sato & Haegele, 2017; Lieberman et al., 2023).

Perceptions of Students with Severe Disabilities

In the book titled *Psychomotor Domain Training and Serious Disabilities*, Jansma (1999) provided a review including the many variations of terminology and attempts to define individuals with severe disabilities. The author cited definitions included in federal statutes, federal policies, and literature. The Office of Special Education Programs used the term *low-incidence population* (IDEIA, 2004). This definition emphasized the presence of visual impairments, hearing impairments, a combination of visual and hearing impairments, significant cognitive impairments, and additional impairments which require specialized instructional personnel (Jansma, 1999, p.11). Others defined this population from the perspective of the limited ability to perform the functions of daily life and the level of dependence on caregivers. Additionally, descriptions of these individuals ranged from unresponsive to aggressive behaviors (Jansma, 1999, p.11). Furthermore, Thompson and Guess (1989) provided a profile of a student with severe disabilities at the sensorimotor stage, including a ". . . low level of environmental awareness due to cognitive difficulties, limited voluntary movement ability, inconsistent ability to community, and medical complications" (Jansma, 1999, p. 12).

Akuffo and Hodge (2008) noted that all of the APE service providers ($N = 6$) in their study felt the more skill development and success students experienced, the more the students enjoyed the activities. Additionally, because they enjoyed the activities and, in turn, developed better skills, this had a lasting impact on their future successes in their communities. However, the study participants believed students' enjoyment and success was also dependent on the type and severity of the disability (Akuffo & Hodge, 2008, p. 254). The perceptions of lower skill

levels and independence in tasks impact the instruction provided to students with SD (Hodge et al., 2004; Layne & Blasingame, 2018). Many times, difficulties or lack of participation are perceived as a lack of motivation by students with SD (Hodge et al., 2004). Additionally, providing the appropriate individualized instruction can be challenging in large class settings because they need more attention during instruction (Ammah & Hodge, 2005; Hodge et al., 2004).

Sato and Haegele (2017a) interviewed participants (n = 9) regarding their practicum experiences within APE graduate programs. Each participant reported, ". . . teaching children with severe disabilities as being difficult and complex" (Sato & Haegele, 2017a, p. 206). Many of the graduate students had limited prior experiences with students with unpredictable behaviors, so these practicum experiences were a ". . . reality shock" (Sato & Haegele, 2017a, p. 207). As teachers experience more opportunities to teach students with SD, they become more comfortable and have better instructional expectations (Ammah & Hodge, 2005).

Lower motor performance expectations are generally held for students with SD. These low expectations impact the quality of instruction provided by the APE service provider, such as focusing on enjoyment rather than skill development (Layne & Blasingame, 2018). Students functioning at the sensorimotor stage of learning are often unable to engage in learning experiences due to their arousal states. Arousal states refer to the ". . . range of levels of awareness influenced by physiological and psychological factors (Smith & Chambers, 2023, p. 247). At times, teachers and service providers will avoid engaging the student with SD in activities when the student is determined to be in a non-alert state (Green et al., 1994). These students' arousal states are often influenced by environmental factors. APE service providers have difficulty engaging these students in activities due to inattention and avoidance of people or

objects. Avoidance could look like dropping or throwing objects, aggression, falling asleep, and engaging in self-regulatory behavior. Often these students allow physical manipulation by others but do not actively participate in the activity (Smith & Chambers, 2023).

Physical education teachers have reported feeling more confident in providing instruction to students with mild disabilities compared to students with severe disabilities (Webster, 1993). They identified the awareness and need for specialized training, exposure, and practical experiences (Layne & Blasingame, 2018; Webster, 1993). When additional coursework in APE is provided, physical education teachers experience more positive attitudes when working with students with SD (Layne & Blasingame, 2018).

Effective Instructional Strategies in Adapted Physical Education

As the inclusion of students with disabilities in physical education becomes more prevalent, there is a greater need for research based instructional strategies (Sato & Haegele, 2017a). The perspective that keeping students ". . . busy, happy, and good" fails to hold accountability for students' learning outcomes (Akuffo & Hodge, 2008, p.262). Physical education teachers are aware of the need to adapt and modify activities and games. However, they have difficulty understanding how to adapt and modify in meaningful ways (Ammah & Hodge, 2005). Many teachers believe they attempt to modify the activity, equipment, or rules. However, researchers have shown that few teachers consistently apply learning environment modifications and activity adaptations (Hodge et al., 2004).

Students learn when effective instruction is provided. Two key factors that facilitate a student with disabilities ability to learn skills are direct practice and feedback. It is important for students to be able to actively practice a skill. With individualized instruction, prompting, and feedback, more skill development is likely to occur (Green et al., 1994; Webster, 1993). APE

service providers, whether teaching a physical education class with students with disabilities, self-contained class, or providing direct instruction must maintain the expectation that students can improve their motor performance (Layne & Blasingame, 2018). Additionally, APE service providers must provide the context for successful motor development, which includes structured routines and activities strategically planned to focus on the individual student's needs. This includes the maximum duration of practice time for skills with purposeful feedback to improve skill development.

Specially Designed Instruction

Vogler et al. (2000) emphasized three categories of specially designed instruction models. The researchers categorized specially designed instruction strategies into curricular adaptations, instructional modifications, and human or people resources (Vogler et al., 2000, p. 162). The researchers focused on human or people resources exploring the impact of an APE service provider used daily in an inclusive setting for a single student. The APE service provider and physical education teacher met at the beginning of the semester and at random times after the initial meeting for planning; however, the researchers did not indicate whether curricular adaptations were discussed during planning (Vogler et. al., 2000, p. 165). The APE service provider implemented the instructional modifications to the daily activity. The researchers stated that the case study student was successfully able to participate for appropriate durations of class time and performed the same task at a different level (Vogler et. al., 2000, p. 165).

McNamara and Pan (2020) defined APE as specially designed instruction in physical education (p. 63). Through this perspective, APE embodies the three categories of specially designed instruction which are curricular adaptations, instructional modifications, and human or people resources. Additionally, LaMaster et al. (1998) conducted a study investigating the

practices of physical education teachers who had been considered highly effective in a previous study. These teachers highlighted the need for individualized instruction and direct instruction as effective instructional approaches (LaMaster et al., 1998, p. 72). Rodgers et al. (2021) provided a similar example in the context of mathematics. The authors described a situation in which a student with a learning disability required an evidence based technique, in this case, cover-copy-compare, in addition to any accommodations the general education teacher could provide. Further, the authors highlighted that accommodations are required to be provided by all instructional staff. Therefore, specially designed instruction should go above and beyond accommodations.

Lesson Planning

Whether teaching a self-contained class or providing itinerant direct instructional services, APE service providers must plan and structure lessons to facilitate student skill development practice. This entails pedagogical considerations such as motor development progressions, including task analysis and understanding prerequisite skills. An additional consideration is class and student management to ensure time on task and multiple opportunities to practice skills. Organization and flow of the practice session or class time, including a consistent warm-up or creative introductory activity, is beneficial (Akuffo & Hodge, 2008; Webster, 1993).

Students benefit from the opportunity to engage in skill development in diverse instructional experiences (Solmon & Lee, 1991) through the differentiation of activities. Skill development can be facilitated through the use of varied and modified equipment (LaMaster et al., 1998; Solmon & Lee, 1991). For example, highly effective physical education teachers report providing students with the opportunity to ". . . juggle with one scarf instead of two" and

". . . giving one step verbal instructions" (LaMaster et al., 1998, p. 72). While best practice in education emphasizes the need for lessons to be planned prior to instruction, literature has provided examples of the lack of lesson planning that includes evidence of modifications and adaptations to instructional activities (Akuffo & Hodge, 2008; Ammah & Hodge, 2005). Lack of planning results in reduced levels of skill performance and the opportunity for naturally occurring peer modeling (Ammah & Hodge, 2005).

When planning lessons, APE service providers need to develop an understanding of various diagnoses and learner profiles (Solmon & Lee, 1991). When APE service providers have knowledge and understanding of how disabilities impact skill development, the providers are more proficient in implementing appropriate activities and using modified equipment (Solmon & Lee, 1991; Vogler et al., 2000). In addition, APE service providers must be knowledgeable of various strategies for motivating participation, such as maintaining a positive classroom environment, positive reinforcement including verbal cues and praise (Akuffo & Hodge, 2008), pacing of instruction, and modification of equipment in creative and nontraditional ways (Solmon & Lee, 1991).

Lessons should be student centered (Akuffo & Hodge, 2008; Solmon & Lee, 1991) and include direct instruction and practice on students' individualized goals and objectives indicated in the IEP (Anunah & Hodge, 2005; Brian & Taunton, 2018; Solmon & Lee, 1991). For example, an APE service provider directs the motor instruction of an overhand throw within a structured overhand throw to visual target activity. The direct instruction would include physical positioning, providing a visual model of the skill components, providing visual prompts such as a visual target to step to when stepping in opposition, and key verbal cues (Brian & Taunton, 2018).

Students who have difficulty with motor skills need explicit instruction to increase motor skill performance. Ozmun and Gallahue (2017) described the interaction of factors between the individual, the task, and the environment in the development of motor performance. The authors highlight the need for the APE service provider to be able to ". . . manipulate these variables to stimulate optional teaching and learning" (Ozmun & Gallahue, 2017, p. 378). This can be accomplished through task analysis of the skills and the individual's present level of performance. These factors should be considered when planning lessons.

Feedback

Focused constructive feedback during skill performance to ensure correct practice on the skill must be provided to the student to support motor skill development (Akuffo & Hodge, 2008; Brian & Taunton, 2018). Often students are provided verbal feedback such as praise and positive reinforcement (Hodge et al., 2009). For example, peer tutors have been trained to provide ". . . positive general and specific skill feedback" through verbal praise such as "Good job stepping forward when you threw the ball" (Houston-Wilson et al., 1997). Further, participants in studies focused on the effect of feedback and reinforcement for students with severe disabilities have demonstrated increases in time on task and improved motor performance (Silliman & French, 1993; Silliman-French et al., 1998).

Effective Instructional Strategies for Sensorimotor Stage Learners

Smith, a consultant for the American Printing House for the Blind, has researched and developed a program of a highly effective research based strategy and evidence-based practices she calls Sensing and Learning. The foundation of this program is the use of a research based instructional strategy called *routines*. Routines are the most effective way to teach students with severe disabilities at the sensorimotor learning stage. Routines incorporate ". . . systematic direct

instruction" within ". . . high-quality social experiences and natural contexts" (Smith & Chambers, 2023, p.17; Smith et.al, 2020).

Smith and Chambers (2023) developed a framework for sensorimotor instruction. Within this framework, effective instruction is delivered when ". . . it is focused, regular, appropriate, natural, consistent." Sensorimotor stage learners need instruction to be focused on priority skills with regular practice on these skills. The authors defined *regular practice* as the practice that happens often throughout the day to strengthen ". . . neurological networks related to patterns of behavior." The skills must be ". . . within the learner's zone of proximal development" (ZPD, p.17). Skills are taught and practiced in the natural environment as much as possible. Consistency, the final component of effective instruction, is critical. Direct instruction must be provided the same way every time. The accommodations, adaptations, and modifications provided to facilitate engagement must be consistent. Consistency is key to reducing student stress to ensure high levels of participation.

When teachers provide direct instruction through routines, students are able to develop coherence. "Coherence is the understanding of what is going on in the world around them and being able to participate in it" (Smith & Chambers, 2023, p. 22). Coherence is developed through consistent, ". . . familiar" learning experiences. Sensory efficiency, taking in and processing environmental information through the senses, is the ". . . most essential component of learning" for sensorimotor stage learners. Supporting sensorimotor stage learner sensory efficiency development maximizes learning potential and minimizes the impact of the severity of their disability on their learning (Barraga & Erin, 2001).

"The ZPD is the space between what one can do alone and what one can do with help" (Vygotsky et al., 1978, p. 131). Additionally, an individual is only capable of imitating and

learning concepts at their developmental level (Vygotsky et al., 1978, p. 88). For example, if a student in the sensorimotor level of learning has not experienced taking items out of a container, no matter how many times the task is modeled, the student will not be able to understand the action. When APE service providers deliver direct instruction within the ZPD, learning occurs, and goals are achievable (Smith & Chambers, 2023). The authors identify different levels of ZPD based on arousal states. Awareness of learner arousal states is important to identify when the learner is ready for learning. Extended states such as drowsy or fussy are not conducive to learning. When students are in a quiet alert or active alert state, learning can occur (Blaha et. al., 1996). The learner's ZPD will influence the expectation of instruction. Attention zone instruction focuses on increasing ". . . the frequency and duration of attention to environmental objects, including familiar people, using all viable sensory systems" (Smith & Chambers, 2023, p.23). Exploration zone instruction facilitates learners' use of an increasing range of exploratory behaviors for recognition and learning of environment objects. When learners are ready for function zone instruction, instruction is focused on increasing the interactions with environmental objects that demonstrate the learner's understanding of the function of the objects.

While many APE service providers have training and knowledge about using instructional routines, many are not aware of what specifically determines a sensorimotor routine specifically. In general, instructional routines have a clear beginning, sequential steps that happen in a specific order, and a clear ending (Houston-Wilson, 2017; Smith et.al, 2020). Within the context of the routine, priority skills and goals are embedded. Additionally, the accommodations needed to facilitate engagement in the skills are included, which supports student engagement at the highest level of independence for that individual (Houston-Wilson, 2017; Smith et.al, 2020).

According to Smith and Chambers (2023) all of the components of the routine are implemented consistently each time the learner attempts the routine. Routines are typically short in duration. The authors distinguish the differences between sensorimotor routines and instructional routines used to teach functional life skills to learners with mild or moderate disabilities. Sensorimotor routines are not taught with the purpose of learning the routine but rather learning the embedded goals. The sensorimotor routine is the ". . . motivating context" (p. 24) in which a learner practices ". . . specific cognitive, communication, and motor skills" (p. 50).

With a better understanding of arousal states, APE service providers can begin to implement sensorimotor routines by developing sensorimotor routine lesson plans. As discussed previously, APE service providers can provide services in a variety of contexts (Sherrill, 2014, p. 4). The factors impacting learner attention determine the setting. APE class can be an appropriate setting if the learner is able to maintain attention with or without accommodations. If a learner cannot maintain attention with or without accommodations in the physical education setting, APE service providers must consider implementing the routine in a different setting. The expectation is not for learners to only participate in routines, but routines are used when learning new skills (Houston-Wilson, 2017). Sensorimotor stage learners can engage in their routine and then integrate into other activities and settings (Smith & Chambers, 2023, p. 29). "Exposure to experiences beyond the upper limit is important, but it is not instruction" (Smith & Chambers, 2023, p.15).

Typical development requires individuals to use their senses. Learners in the sensorimotor stage use their tactile and visual systems primarily when learning skills. These learners are more efficient and learn best when using both systems together. However, this can

be difficult for some with more severe physical impairments (Gibson & Pick, 2000). Smith and Chambers (2023) identify ". . . sensory complexity" as an area of challenge for sensorimotor stage learners. It's important to provide sequential exposure by facilitating engagement with one system at a time with short breaks between the next system. When providing accommodations and facilitation of motor skills, physical manipulation of the learner, such as using hand over hand prompting is not practice for the learner. For learning to occur, the sensorimotor stage learner must actively engage in the activity (p. 57). Sensorimotor stage learners must be given the opportunity to self-initiate movement and then can be provided with assistance to fully execute the movement.

Summary

An analysis of the relevant literature provides insight into the instructional framework and practices common among APE service providers. These obligations include providing specially designed instruction as mandated by IDEA (Yell et al., 2021). Lesson planning is critical to the facilitation of learning experiences for students. Lesson plans should include strategies for developing motor skills and the necessary adaptations and modifications. Numerous researchers have highlighted the need for expanding current pre-service training to better prepare future APE service providers. Students with SD at the sensorimotor stage of learning are perceived as being a challenge and an area of need for training. Researchers in the literature emphasize the feelings of frustration and decreased confidence levels influenced by this lack of training. While the researchers have highlighted the benefits of pre-service training and in-service professional development for current teachers, the researchers have not provided a comparison of the highly effective strategies in APE practice and the highly effective strategies for students at the sensorimotor stage of learning (Smith et.al, 2020).

Next, the researcher detailed the study procedures for the modification of the questionnaire, the one-group pretest-posttest research design, and the professional development intervention in Chapter 3. The researcher was guided by the theory of planned behavior framework during this study. Additionally, the researcher explored how a professional development module focused on strategies for students at the sensorimotor stage of learning based on Piaget's Theory of Cognitive Development contributes to APE service providers' self-reported use of effective strategies that improve student outcomes (Guskey, 2002). APE service providers are guided through the process of applying these strategies. At the conclusion of the professional development learning opportunity, participants' perceptions will be measured.

CHAPTER 3

> Actions, then, are controlled by intentions, but not all intentions are carried out; some are abandoned altogether while others are revised to fit changing circumstances (Ajzen, 1985, p. 11).

Methodology

In this investigation, the one-group pretest-posttest design was used for two purposes. First, the researcher initially investigated adapted physical education (APE) service providers' perceptions of providing APE instruction to students at the sensorimotor stage of learning through a virtual questionnaire that was developed. Secondly, the researcher examined APE service providers' self-reported use of highly effective instructional practices and strategies (Smith et. al., 2020) after a self-paced asynchronous professional development module. Guskey (2002) described professional development as ". . . systematic efforts to bring change in the classroom practices of teachers, in their attitudes and beliefs, and in the learning outcomes of students" (p. 381). Participants completed a questionnaire before and after the self-paced asynchronous professional development module. The investigator used the data collected through the questionnaire to explore APE service providers' changes in perceptions based on their participation in the asynchronous self-paced professional development module. Perceptions are based on definite events while beliefs are developed over time (Smith, 2001). The theory of planned behavior provides the theoretical framework for this investigation. Described in this chapter are the method, participants, instrumentation and procedures, intervention, and data analyses.

Theoretical Framework Rationale

Theory of Reasoned Action

Ajzen (1985) explained the theory of reasoned action as ". . . the assumption that human beings usually behave in a sensible manner" (p. 12). In the context of APE, it is assumed that APE service providers intend to provide quality learning experiences for all students (Yell et al., 2021). Ajzen further explained two factors that impact intentions: "attitude toward the behavior" and "subjective norm" (p. 12). An individual's perceptions of performing a behavior can be either positive or negative. The extent to which the perceptions or belief is held is determined by the value placed on the outcome of the behavior. This influences the individual's attitude about performing the behavior and ultimately if the individual will act on the intent of performing the behavior. For example, if an APE service provider believes implementing an instructional strategy will have a positive outcome for student learning the service provider is more likely to implement the strategy.

Ajzen (1985) defined subjective norm, as perceived social pressures placed on performing or not performing the behavior (p. 12). Again, in the context of APE instruction, this can be viewed as the expectations of accountability for instruction of meaningful learning experiences. Further, an individual's attitude toward a behavior is described by the term behavioral beliefs (p. 14). The perceived social pressure, or subjective norm, is described by the term normative beliefs (p. 14). An additional factor impacting an individual's performance of a behavior is perceived volitional control, meaning the behavior can be easily performed if so desired. The theory of reasoned action elucidates an individual's behavior in terms of their beliefs, both personal attitude and normative expectation. Essentially, ". . . by examining the

underlying belief structure, one can also gain a good understanding of the factors that ultimately determine a person's decision to perform or not perform a given behavior" (p. 16).

Continuing the example of an APE service provider providing quality learning experiences, there are factors that influence the consistency of the APE service providers intentions (Ajzen, 1985, p. 18), which in this example is providing meaningful instruction. Semmer's personal communication (as cited in Ajzen, 1985) explained that over time an individual's belief whether positive or negative could ". . . resolve in favor of more routinized responses" (p. 19). The intent to provide a quality learning experience may decline and routine or ". . . survival-like practices and quick fixes" (Sato & Haegele, 2017a, p. 207) may be implemented instead. Ajzen (1985) continued to explain that intentions can change when new information is introduced, and the intention is ". . . revised" based on changes in an individual's personal and social perceptions (p. 19).

Ajzen (1985) also provided insight into the variance of strength of intentions. A drastic change in behavior may not be observed, however, the strength of the intention may decrease or increase. When considering an individual's confidence in their intention, greater confidence typically correlates with stronger intentions. An additional consideration is the influence of time on the stability of intentions. The many influences that could result in a behavioral change highlight the transitional nature of behavioral intentions. "Strictly speaking, all an individual can say is that, as of now, they intend to perform a given behavior, and can assign a certain degree of confidence (subjective probability) to that intention" (p. 24).

Ajzen (1985) prompts consideration of behaviors that are outside of individual's control (p. 24). Individuals may experience failure during an attempt rather than a change in intention. This can be due to internal factors such as individual differences, lack of needed information,

skill level, and abilities. Additionally, external or situational factors influence control over behavioral intentions. These factors are categorized into time and opportunity and dependence on other people (p. 27). An individual may intend to demonstrate a behavior, however, is unable due to a lack of opportunity. Consider this in the context of the APE service provider attempting to provide direct instruction. If the student with severe disabilities is sleeping, the APE service provider may intend to provide a quality learning experience but is unable due to the lack of opportunity to work with the student. Another consideration is the lack of time for planning may impact the APE service provider's performance of instruction without changing their intent to provide instruction. The APE teacher may need assistance to provide instruction to a student such as moving a student into a supported position. Another individual may not be available to help transfer the student leaving the APE service provider unable to perform the attempt but maintains the intention. These factors influence the individual's conceived volitional control transition considerations to an expansion of theory of reasoned action detailed in the next section.

Theory of Planned Behavior

Theory of reasoned action is applicable when perceived success or control and actual degree of control over a behavioral intention are equal and perfect (Ajzen, 1985, p. 35). However, few individuals encounter situations with a perfect level of volitional control. The theory of planned behavior (TpB) provides a more appropriate applicable framework for the purposes of this investigation. The TpB recognizes situations in which individuals may not have volitional control (Montano & Kasprzk, 2015). Ajzen (1985) described an individual's process to confront the concept of control as developing a plan to facilitate performance of the behavior (p. 31). As with the theory of reasoned action, individual differences and external factors may

influence control over the intended behavior. Additionally, the more the individual believes the behavior can be performed and that the behavior is socially desired by others, the more likely the individual will attempt the intended behavior.

Ajzen (1985) described behavioral expectations in regard to a person's estimate of the likelihood that a certain behavior will actually be performed. Prediction of behavior expectations is based on an individual's realistic assessment of their personal skills, willpower, degree of actual control, and presence of external factors (p. 34). Factors that influence an individual's perceptions of control include past experience, availability of a plan of action, and general knowledge of self. An example of an investigation related to pre-service practicum experiences indicated these experiences resulted in enhancing confidence levels of pre-service teachers working with students with severe disabilities (Jeong et al., 2017).

In summary, a successful attempt to execute behavior follows a developed behavioral plan which depends on effort and control over factors including information, skills, abilities, willpower, time, and opportunity (Ajzen, 1985, p. 36). The TpB is used in this present investigation as the framework to investigate and interpret participants' perceptions about providing APE services for students at the sensorimotor stage of learning prior to and after being provided new information. The investigator collected data to consider individual differences, perceptions about providing APE services to students with students with SD at the sensorimotor stage of learning, and challenges with time and opportunity experienced by in-service APE service providers when teaching students with SD at the sensorimotor stage of learning. New information is provided in the form of a professional development module. It is described in the next section related to the research method design used in this investigation.

Method

A pretest-posttest one group research design was implemented using a quantitative data collection method (Gay et al., 2006). APE service providers participated in an asynchronous self-paced professional development learning opportunity over a 3-week time period. APE service providers were asked to complete the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP; see Appendix A) which is a modified version of the Teacher's Beliefs and Intentions Toward Teaching Students with Disabilities (TBITSD; Joeng, 2008) prior to the intervention and on completion of the professional development learning module as a posttest measurement. The process for the validation of the TBITSD is detailed in the Instrumentation and Procedures section. Authors of relevant literature emphasize research limitations specifically focused on current APE service providers, professional development, and perceptions of working with students with severe disabilities at the sensorimotor stage of learning. The information gained through this investigation supports a broader understanding of the perceptions of current APE service providers specific to students at the sensorimotor stage of learning. Following review and approval (see Appendix B) from the Slippery Rock University International Review Board (IRB) in December 2023, the pretest-posttest one group research investigation was conducted.

Participants

The targeted participants to curate a representative sample (Johnson & Christensen, 2014) in this investigation were APE service providers who are currently used at a public, private, or charter school within the state of Texas. Using the geographical area within Texas provided the researcher with the opportunity to include APE service providers who are considered specialist and generalist, as well as any other professionals employed to fulfill the service provider role.

APE providers across Texas provide services in urban, suburban, and rural schools. Additionally, the area provided the opportunity to gather data from APE service providers with diverse experiences including teaching a range of students with various socioeconomic statuses and cultures with SD. Demographic data were collected to verify each participant's APE service provider status. The population was considered purposive in order to capture individuals currently used to provide APE services in Texas.

Currently, there is no comprehensive list of contact information for all individuals used to provide APE services in public, private, and charter schools in Texas. Using the 2023-2024 APE listserv which includes the most recent list of APE service providers in the Region 10 area, the researcher had access to 99 individuals' contact information who are known to be used by public, private, or charter schools to provide APE services in Texas. The listserv includes APE service providers in other Regions in Texas; however, the listserv is voluntary and not a comprehensive list of all the Regions across Texas. The researcher considered requesting permission to use the Texas Association of Health, Physical Education, Recreation, and Dance (TAHPERD) listserv for teachers who self-report as APE teachers as part of their membership. However, the Past Chair of Adapted Physical Education in the Physical Education Division of TAHPERD shared that the list had decreased significantly since 2020.

In order to increase the sample, a snowball sampling technique was used to encourage potential participants to share the investigation information with other known APE service providers in Texas. Each year new service providers to the profession are employed and some retire. Using the snowball sampling technique provided the opportunity to include new to the field service providers, as well as, service providers who might not seek out professional development learning opportunities (e.g., attending a conference).

The exact number of individuals providing APE services across the state of Texas is unknown. Therefore, the sample size was derived from the accessible population of 99 individuals included on the Region 10 Educational Service Center (ESC) APE Listserv. Using this population (99 individuals), a confidence interval of five, and a 95% confidence level, the researcher used a sample size calculator to determine a sample size of 61 participants needed to be surveyed. However, Gay et al. (2006) notates a common guideline for descriptive research is a sample size of 10% to 20% of the population (p. 110). The authors also support the general requirement of a minimum of 30 participants as an acceptable sample size (p. 192). Therefore, a sample size of 30 to 50 participants was considered a reasonable expectation for the investigation sample. This sample size accounts for factors including incorrect email addresses, emails going to Spam folders, and emails blocked by security measures.

The Region 10 APE service provider listserv reflects 75% of APE service providers are female and 25% are male. Approximately, 53% have completed the process for Certified Adapted Physical Education (CAPE), the nationally recognized certification. The listserv is comprised of individuals with less than 1 year of APE Service Provision experience to over 40 years of APE Service Provision experience. This information is specific to the APE service providers in the Region 10 geographical area which is the accessible population used by the investigator in this investigation because a more comprehensive list was unavailable.

The targeted participants represent a varying range of levels of experience, novice and expert, and educational backgrounds, generalists and specialists, as identified in the review of relevant literature. Participants have background experiences in physical education and special education teachers, as well as, certifications ranging from general physical education to CAPE. Inclusion criteria required individuals to currently be used as an APE service provider.

Instrumentation and Procedures

In September 2023, a representative of the Region 10 APE Specialists team provided a list of APE listserv participants that represent APE service providers in Texas to the researcher for participant recruitment. Permission to use the contact information was granted in September 2023 by a representative of Region 10 ESC (see Appendix D). Following Slippery Rock University's Institutional Review Board (IRB) approval of the investigation in December 2023, an introductory email (see Appendix E) that included the purpose of the investigation, an overview of the investigation procedures, an overview of the professional development module (see Appendix F), and a link to the IRB approved consent form (see Appendix G). Potential participants completed the IRB approved consent form through the Qualtrics online platform. The Qualtrics online program includes features that maintain anonymity of participants responses throughout the pretest-posttest one group research design. These features were used in the present investigation. Potential participants were also encouraged to share the investigation information with known APE service providers that are currently used by public, charters, and private schools across Texas. An initial 2-week duration was used to recruit participants and gather consent through a link sent through Qualtrics. At the end of the first week a reminder email was sent through Qualtrics to the original potential participants on the listserv. Colleagues in the field indicated they had not received the initial or reminder email sent through Qualtrics. Some indicated the security measures implemented at their place of employment had filtered the emails to their junk or spam folders and others indicated that the emails were completely blocked. After the initial 2-week recruitment period, the researcher extended participant recruitment by an additional 2 weeks to secure the minimum number of participants. An email with the initial recruitment email, reminder email, and an attached document that could be used

to support the use of the asynchronous self-paced professional development on the upcoming staff development days was distributed through the researcher's email to ensure delivery. Colleagues at the Region 10 ESC also included the investigation information in a monthly newsletter distributed to the original listserv. Additionally, the researcher led a professional development training on another topic at the Region 10 ESC which provided another opportunity to recruit investigation participants.

All participants who completed the consent form were able to instantly access the Adapted Physical Education Service Providers Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) questionnaire (see Appendix A) through the Qualtrics online platform format. When the recruitment window to complete the questionnaire ended, all participants (n = 29) who completed the consent and the pretest questionnaire followed the link at the end of the pretest questionnaire to download the *Sensorimotor Guided Practice Workbook* (see Appendix H) asynchronous self-paced professional development.

Once consent was obtained, the participant was provided a link to the PSP serving as the pretest. The PSP pretest was administered through the online platform Qualtrics. The link to the PSP pretest was available for a period of 4 weeks in January and February 2024. The PSP pretest questionnaire required approximately 20 minutes to complete, and participants were asked to complete the questionnaire one time. A reminder email was generated and sent to all potential participants to complete the questionnaire at the beginning of the second week. At the conclusion of the 4-week duration and the sample size requirement was met, the questionnaire was closed.

At the conclusion of the recruitment process, 35 individuals had accessed the investigation participation link. Of the 35 respondents, 1 respondent did not provide consent, 2 respondents indicated consent but did not complete the questionnaire, 1 respondent entered "no"

on the qualifier question ("Are you currently being used by a public, private, or charter school to provide APE services?"), and 2 respondents indicated consent, did not complete the questionnaire, and then provided consent and completed the questionnaire in their second response. After removal of these responses, 29 participants met the eligibility criteria, provided consent, and completed the pretest questionnaire.

Participants were assigned and emailed a random ID on completion of the PSP. The participants were provided a link at the end of the PSP to access the self-paced asynchronous professional development module developed by the researcher. The self-paced asynchronous professional development module was accessible through a link emailed to participants. The asynchronous self-paced professional development module was provided in the format of a *Sensorimotor Guided Practice Workbook* that was available for an 8-week window during January through March 2024. Participants who completed consent and the questionnaire at the beginning of recruitment had more time available to complete the self-paced asynchronous professional development module than those that completed consent at the end of the recruitment process. Participants who completed consent and the pretest questionnaire during the last week of the recruitment process had 3 weeks to complete the self-paced asynchronous professional development module.

Participant Communication

At the end of the recruitment and pretest process, an email was distributed to all participants providing their individual randomly generated ID, the link to the downloadable *Sensorimotor Guided Practice Workbook*, and a general timeline of the remaining investigation process. The researcher used the features of the online software (Qualtrics) to generate an individual identification number for each participant. This number was generated automatically

by Qualtrics and was designed to be random so that no participants received the same number. The number was communicated to the participant within the consent and pretest questionnaire link. Approximately a week later an additional email reminder with a reminder to complete the quizzes at the end of each section in the *Sensorimotor Guided Practice Workbook* and the general timeline was distributed to participants. At the beginning of the remaining week of the intervention time period, participants were emailed as a final reminder with a link to the posttest questionnaire, the description of the interview process, a copy of the interview questions, and the remaining timeline. On the final day of the intervention process, this information was distributed again to participants with information regarding the member checking process and the remaining timeline.

Once the *Sensorimotor Guided Practice Workbook* was completed, participants were provided with a link which prompted them to use the ID number assigned at consent when completing the posttest PSP during February through March 2024. The randomly generated ID number assigned to each participant was used to link the pretest and posttest questionnaire data.

Interview Protocol

At the conclusion of the posttest questionnaire, 10 participants were randomly selected to participate in a follow-up interview. Using the online platform (Qualtrics), participants were randomly provided either a final section thanking them for their participation in the investigation with their certificate of completion or an option to choose a time slot for the follow-up interview and their certificate of completion. After selecting an available time slot, the randomly selected participants were provided a copy of the interview protocol (see Appendix I) and a Google voice number to call. The phone interview approach was chosen rather than the video chat approach to ensure continued anonymity for the participant. The purpose of the interview was to gather

supplemental descriptive information related to the instructional strategies used before and after the intervention. Also, participants were asked about how their level of confidence and perceptions of students with severe disabilities at the sensorimotor stage of learning had changed after the intervention. Finally, participants were asked to share their thoughts about the *Sensorimotor Guided Practice Workbook* professional development module in general.

During the phone interviews, the researcher followed the interview protocol (see Appendix I) as it was written and provided sufficient time for participant responses (Christensen et al., 2015). The researcher monitored the participants understanding, the interview question and answer process, and remained neutral in an attempt to limit interviewer effects (Christensen et al., 2015; Patton, 2015). Additionally, the researcher provided feedback throughout the interview to continue to support the developing rapport and ensure ". . . high-quality" relevant responses (Patton, 2015, p. 467).

Purpose and Design of the TBITSD

The Teacher's Beliefs and Intentions Toward Teaching Students with Disabilities questionnaire was developed by Jeong (2008) as part of the dissertation investigation conducted to ". . . examine Korean physical education teachers' beliefs and intentions to teach students with disabilities in their physical education classes" (p. 9). Jeong developed a pilot study (see Table 2) adhering to the direction provided by Ajzen (2004) to address content validity. Participants in Jeong's pilot study included 21 physical education teachers in Korea who each taught physical education full-time. The nine open-ended questions based on recommendations by Ajzen were used to elicit beliefs from the participants to target the behavior of inclusion. Jeong provided participants with descriptions of two students with disabilities, one student with an intellectual

disability, and one student with a physical disability because they represented the two most prevalent type of students with disabilities included in general education classes in Korea.

Table 2

TBITSD Pilot Study Questionnaire

Pilot Study Questions
Behavioral Beliefs
1. What do you believe are the advantages of teaching the following students in your physical education program?
2. What do you believe are the disadvantages of teaching the following students in your general physical education program?
3. Is there anything else you associate with teaching the following students in your general physical education program?
Normative Beliefs
1. Are there any individuals or groups who would approve of teaching the following students in your physical education? If so, who?
2. Are there any individuals or groups who would disapprove of teaching the following students in your physical program? If so, who?
3. Are there any individuals or groups who would come to mind when you think of teaching students with disabilities? If so, who?
Control Beliefs
1. What factors or circumstances would enable you to teach the following students in your physical education class?
2. What factors or circumstances would make it difficult or impossible for you to teach the following students in your physical education class?
3. Are there any other issues that come to mind when you think about the difficulty of teaching the following students in your physical education class?
12 Demographic Questions
Gender
Years of teaching experience
Personal experience with people with disabilities
Adapted Physical Education courses
In-service programs attended

Note. Description of pilot study questionnaire developed by Jeong (2008) based on Ajzen's 2004 guidelines to target the behavior of inclusion.

A pilot study was translated from English to Korean and five expert professionals were part of the translation process. The experts concluded that the translated statements reflected the same content as the original English version. Based on the results of the pilot study, there were 69 behavioral belief responses, 71 normative belief responses, and 108 control belief responses (Jeong, 2008). The top 75% of all beliefs were included in the main survey called the Physical Education Teacher's Beliefs and Intentions Toward Teaching Students with Disabilities (TBITSD; Jeong, 2008). Jeong (2008) categorized the direct and indirect measures into three categories: (a) behavioral beliefs (attitude), (b) normative beliefs (subjective norm), and (c) control beliefs (perceived behavioral control; p. 72). The main survey, TBITSD, was reviewed by numerous experts in Korea and in the United States and considered to possess content validity (Jeong, 2008).

The TBITSD presented a description of a student with an intellectual disability for context and 83 items that were divided among seven sections: (a) Attitudes, subjective norm, and perceived behavioral control, (b) Behavioral beliefs, (c) Normative beliefs, (d) Control beliefs, (e) Intention, (f) Behavior, and (g) Questions about self and background. The TBITSD involved close-ended questions and a Likert-type scale (quantitative data). As Joeng (2008) emphasized, some participants "may have neutral feelings about this topic" and the 7-point Likert-type rating scale allowed participants to report their neutral feelings rather than having to choose either a positive or negative response (p. 74). Using the TBITSD, Jeong analyzed the data collected to answer the dissertation research questions:

> RQ 1. Are physical education teachers' intentions to teach students with disabilities in their physical education classes determined by: (a) behavioral belief (attitude), (b) normative belief (subjective norm), and (c) control belief (perceived behavioral control)?

RQ 2. Are physical education teachers' self-reported behaviors in teaching students with disabilities in their physical education classes determined by: (a) intentions, and (b) the three components of behavioral belief, normative belief, and control belief?

RQ 3. Which demographic variables, teaching experience, and preconceived notions are related to physical education teachers' intentions to teach students with disabilities and self-reported teaching behaviors?

Regarding RQ 1, Jeong (2008) indicated that direct measures (attitudes, subjective norm, and perceived control beliefs) and indirect measures (behavioral beliefs, normative beliefs, and control beliefs) are significant predictors of teachers' intentions to teach students with disabilities. The direct and indirect measures were also highly correlated (p. 117). Additionally, the investigation (Jeong, 2008) elucidated that the more positive the attitude and subjective norm and the greater the perceived control toward teaching students with disabilities the stronger the intention to teach students with disabilities.

Jeong documented a unique aspect of the investigation (2008) in comparison to other studies is that the TBITSD measured the physical education teachers' self-reported behavior in teaching students with disabilities in their physical education classes (p. 118). Regarding RQ 2, the three components (attitudes, subjective norm, and perceived control beliefs) were significant predictors for teachers' intentions and had an indirect effect on self-reported teaching behavior through intentions (see Figure 3; p. 18). Jeong (2008) determined that teachers' intentions were the only predictor of teachers' self-reported teaching behavior (p. 118). Jeong attributed the low variance on behavior (%) to possible use of complicated scales and/or having behavior questions that were not parallel with intention questions (p. 121). Jeong intentionally included questions about not only whether physical education teachers were teaching students like the provided

description (student with an intellectual disability) but also how effectively the teachers were teaching these students. The teaching behavior questions included curricular and instructional strategies such as do you repeat instruction, assign peer tutors, adapt for safety, and provide additional instruction on skills (Jeong, 2008, p. 120). Jeong (2008) documented that at that time no other investigation using theory of planned behavior had attempted to measure quality indicators (e.g., instructional, curricular, equipment modifications; p. 120).

Finally, regarding RQ 3 Jeong (2008) highlighted correlations between the quality of physical education teachers' teaching experience and physical education teachers' decision to teach students with disabilities when they have total freedom to choose whether to teach or not and teachers' intentions (p. 123). Additionally, teachers' competence, which was highly related to the number of adapted physical education courses, number of in-service programs, and the quality of teaching experience, was a significant predictor of teachers' self-reported teaching behavior (Jeong, 2008, p. 123).

Next, 11 questions were selected from the TBITSD and were used to ". . . examine pre-service physical educators' previous teaching experience, confidence, and professional attributes" (Jeong, 2013, p. 11; see Table 3). These questions were used by Jeong to collect data from pre-service physical education teacher candidates regarding general professional attributes, specific previous experiences working with students with disabilities, and to rate their confidence level when teaching students with disabilities. Participants were all enrolled in an Introduction to APE course and taught students with disabilities as part of their practicum experience in the introductory course. The participants were asked to complete the questionnaire on an online platform prior to teaching students with disabilities in the practicum. Jeong modified the questionnaire developed in 2013 based on the TBITSD for a similar study completed in 2017

(Jeong et al., 2017; see Table 3). This study was again completed with pre-service physical education teacher candidates prior to their Introduction to APE course practicum experience with teaching students with disabilities. The 2013 survey was modified again in 2021 by Jeong and other researchers to include measuring satisfaction with practicum experience, as well as confidence (see Table 3 below). Participants (n = 189) rated their level of agreement or disagreement with statements on the survey using a five-point Likert scale. The investigators implemented a pretest-posttest research design using the TBITSD prior to and after participation in the practicum experiences throughout the entire semester.

TBITSD Modification Process

Permission to use and modify the TBITSD was requested and granted by Dr. Mihye Jeong in August 2023 (see Appendix C). While the TBITSD was originally used to gather data from pre-service physical education teacher candidates in Korea, with modification the TBITSD is suitable to use with in-service APE service providers (Jeong, 2008). The initial step in the modification process after receiving permission to use and modify the questionnaire was based on Jeong's recommendations. Jeong suggested that the questionnaire would benefit from a thorough revision as it was developed based on the theory of planned behavior (TpB) and for Korean physical education teachers. This revision process is detailed in the following paragraphs. Jeong also suggested that revision to the questionnaire could ensure the questionnaire was efficient and applicable (M. Jeong, personal communication, August 29, 2023). Questions and statements focusing on issues relevant only to inclusion or specifically to physical education were excluded from the modified version of the TBITSD (see Table 4).

Table 3

Comparison of Survey Use

Study	*Pre-Service Physical Educator Attributes and Confidence in Teaching Individuals with Disabilities: A Preliminary Study (Jeong, 2013)*	*Role of Previous Experience on Pre-Service Physical Educators' Confidence in Teaching Individuals with Disabilities: Mediation Analysis (Jeong et al., 2017)*	*The Effects of Adapted Physical Education Practicums on Pre-Service Physical Education Teachers' Confidence (Jeong et al., 2021)*
Participants	-Preservice physical educators -Undergraduate students enrolled in an Introduction to APE course	-Preservice physical educators -Undergraduate students enrolled in an Introduction to APE course	-Preservice physical educators -Undergraduate students enrolled in an Introduction to APE course
Instrument	**Survey 11 questions** Examined: **Professional attributes** -First aide training/certifications -Athletic experience -Ability to use sign language -Swim instruction certifications **Previous experiences** -Age -Gender -Disability groups **Confidence teaching an individual with a disability** -5-point Likert-type scale	**2013 Survey Modified: 10 questions** Examined: **Professional attributes** -First aide training/certifications -Athletic experience -Ability to use sign language -Swim instruction certifications **Previous experiences** -Age -Gender -Disability groups **Quality of previous experiences** -5-point Lickert Scale **Confidence teaching an individual with a disability** -5-point Likert-type scale	**2013 Survey Modified: 12 questions** Examined: **Professional attributes** -First aide training/certifications -Athletic experience -Ability to use sign language -Swim instruction certifications **Previous experiences** -Age -Gender -Disability groups **Quality of previous experiences** -5-point Lickert Scale **Confidence teaching an individual with a disability before practicum** -5-point Likert-type scale **Confidence teaching an individual with a disability after practicum** -5-point Likert-type scale
Procedure	Survey was conducted before students had the opportunity to teach an individual with disability during the practicum within the Introduction to APE course	Survey was conducted before students had the opportunity to teach an individual with disability during the practicum within the Introduction to APE course	Survey was conducted **before and after** students had the opportunity to teach an individual with disability during the practicum within the Introduction to APE course

Note. Provides a comparison of survey use across multiple studies with modifications to the sections within the instrument.

After questions were removed the next step was to replace the wording "physical education/physical education teachers" with the "adapted physical education/adapted physical education service providers." The definitions for "severe disability" and "sensorimotor stage of learning" were included to provide context. Additionally, the student description of Jiho was replaced with a description of a student at the sensorimotor stage of learning.

> Taylor has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Taylor uses a wheelchair, is dependent on others to push the wheelchair, and for transitions into and out of the wheelchair. Taylor is not able to follow verbal directions. Taylor is able to reach and grasp objects. However, it takes an extended amount of time for movement. Taylor sleeps during the day and can be fussy. Taylor does not engage with classmates often. When given an object, Taylor may drop the object away. Taylor allows physical manipulation of the arms, hands, legs, and feet by adults during activities.

After feedback from the dissertation committee, the title was changed to Adapted Physical Education Service Providers Perceptions of Sensorimotor Stage Learners' Service Provision (PSP).

Table 4

Modified TBITSD Exclusions

Exclusions
Behavioral Beliefs
1. Teaching students like Jiho in my physical education class would positively change how students without disabilities will feel about students like Jiho. Unlikely/Likely
2. Changing how students with disabilities feel about students like Jiho would be: Extremely worthless/Extremely valuable
3. Teaching students like Jiho in my physical education class would result in less instruction and practice time for students without disabilities. Unlikely/Likely
4. Reduction of instruction and practice time for students without disabilities would be: Extremely bad/Extremely good
5. Teaching students like Jiho in my physical education class would result in cooperation between students with and without disabilities. Unlikely/Likely
6. An increase in cooperation between students with and without disabilities would be: Extremely useless/Extremely useful
7. Teaching students like Jiho in my physical education class would take time away from students without disabilities instruction time. Unlikely/Likely
8. Taking time away from students without disabilities' instruction time would be: Extremely bad/Extremely good
9. Teaching students like Jiho in my physical education class would enhance socialization for both students with and without disabilities. Unlikely/Likely
10. Enhancing socialization for both students with and without disabilities would be: Extremely useless/Extremely useful
Normative Beliefs
1. Most students without disabilities think that: I should not/I should - teach students like Jiho in my physical education class.
2. Generally speaking, I would do what most students without disabilities think I should do: Strongly disagree/Strongly agree
Control Beliefs
1. My school, in general, can accommodate students with disabilities. Unlikely/Likely
2. That my school, in general, could accommodate students with disabilities would make teaching students like Jiho in my physical education class: More difficult/Easier
3. There is harmony between students with and without disabilities in my physical education class. Unlikely/Likely
4. Harmony of students with and without disabilities would make teaching students like Jiho in my physical education class: More difficult/Easier
5. Usually, people have a prejudice against students with disabilities that students with disabilities like Taylor cannot learn and do well. Unlikely/Likely
6. People's prejudice against students with disabilities would make providing APE service for students like Taylor: More difficult/Easier

Questions about yourself and your study
1. Have you ever had personal experience with individuals with disabilities? Yes/No
If yes, who did you have? Check all that apply.
2. If you have taught students like Jiho in your physical education class, what was your experience with students like Jai Ho in physical education class? Extremely bad/Excellent

At this point, the PSP was shared with Expert A, a professor emeritus with expertise and experience using the theory of planned behavior to develop surveys and questionnaires. Expert A provided suggestions and examples that were included in the final draft of the PSP. These recommendations included reorganization of some questions and rewording of the categories to be more relatable to the participants (see Table 5).

Table 5

Comparison of TBITSD and PSP Categories

TBITSD	PSP
Attitude, Subjective Norm, and Perceived Behavioral Control	Please share your attitude toward providing APE services for students like Taylor.
	Please share your perceptions of what others think about APE service provision for students like Taylor.
	Please share your perceptions of your ability to provide APE services for students like Taylor.
Behavioral Beliefs	Please share your beliefs about providing APE services for students like Taylor.
Normative Beliefs	Please share your perceptions of expectations of others for APE service provision for students like Taylor.
Control Beliefs	Please share your perceptions of external factors when providing APE services for students like Taylor.
Intention	Please share your intentions to provide APE services for students like Taylor.
Behavior	Adapted Physical Education Service Provision Perceptions.
	Adapted Physical Education Service Provision.
Questions about yourself and your study	Professional Background.
	Preservice Teacher Preparation.
	In-service Teacher Professional Development.

Expert A, also, recommended using a gender-neutral name for the student in the sensorimotor stage learner description. A panel of experts in programming for students with severe disabilities including an Adapted Physical Education specialist (Expert A) and consultants for the American Printing House for the Blind (Experts B and C) reviewed the description of the sensorimotor stage learner in the PSP. Expert C recommended the addition of another description to provide participants with a better representation of the range of student profiles within the sensorimotor stage of learning. The following description was added to the PSP:

> Alex has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Alex is ambulatory and wears ankle-foot orthoses and a scoliosis brace. Alex typically walks at a reduced pace with stand by support for safety. Alex is able to transition from standing to sitting and sitting to standing with support. Alex is able to manipulate objects by grasping, releasing, banging, swiping, dropping, and is beginning to toss objects in an intended direction for a short distance. Alex is able to reach for a floating balloon and pull the balloon to his body in an attempt to catch. Alex enjoys looking at and interacting with familiar adults and peers. Alex will protest when not feeling well or not interested in an activity. Alex is able to make choices and communicate wants with pictures and an Augmented and Alternative Communication (AAC) device.

This version of the PSP was shared with an additional associate professor at another university, Expert D, who had experience with the theory of planned behavior. Expert D provided recommendations for the removal of questions that seemed redundant. Expert D also recommended the addition of questions regarding participants' confidence in additional aspects of the APE role including confidence to develop goals and objectives and confidence to develop

a Present Level of Academic Achievement and Functional Performance (PLAAFP) statement. These questions were added to the PSP. Finally, Expert D recommended adjusting the anchors of the scales to be consistent by using Strongly Disagree and Strongly Agree throughout the PSP questionnaire. This required rewording of some questions. All of these adjustments were made in the development of the final PSP.

Similar to Jeong's subsequent study "*The Effects of Adapted Physical Education Practicums on Preservice Physical Education Teachers' Confidence*," (2021), the current investigation was designed to gather data before and after APE service providers participated in the asynchronous self-paced professional development focused on instructional strategies for students at the sensorimotor stage of learning. The posttest consisted of the same questions as the pretest without the demographic, professional background, pre-service teacher preparation, experience, and in-service professional development questions (see Appendix J).

While the investigation design was developed within the theoretical framework of theory of planned behavior, the research questions focused on the participants' perceptions and self-reported learning. Participants' perceptions of students at the sensorimotor stage of learning are influenced by: (a) past experiences with students at the sensorimotor stage of learning, (b) individual differences including educational background, (c) personal attitude, (d) perceptions of what others think, (e) perceived level of confidence in personal abilities, (g) personal beliefs, (h) perceptions of Service Provision expectations, and (i) perception of external factors. Participant's self-reported individual differences including educational background, field experience, and professional development were explored to address RQ 1 "What preparation opportunities have APE service providers had to develop knowledge for providing services to students with severe

disabilities at the sensorimotor stage of learning?" The posttest questionnaire after the asynchronous self-paced professional development module addressed RQ 2, 3, and 4.

The researcher focused the final modification of the TBITSD on the question related to the frequency of modification implementation. The original TBITSD was developed for physical education teachers and focused on inclusion therefore the data collected were related to modifications. The TBITSD test items: (a) repeat directions, (b) assign a peer tutor, (c) change the rules of the game, (d) adapting for safety, (e) modify fitness testing, and (f) give special reinforcement were continued in the PSP. The researcher added the accommodations: (a) provide adapted equipment and (b) provide extra skill instruction which are commonly provided by APE service providers (Bates, Pigg, Lucas, McCKenny, & Hahn, 2022). Next, implement a routine, the research-based strategy was added as this is the critical instructional strategy for students with severe disabilities at the sensorimotor stage of learning (Smith & Chambers, 2023; Smith et.al, 2020). Finally, evidence-based practices were added: (a) provide least to most prompting, (b) provide most to least prompting, (c) provide hand over hand guidance, (d) provide hand under hand guidance, (e) provide tactual modeling, (f) provide visual modeling, and (g) provide one on one instruction (The IRIS Center, n.d.). These strategies were selected because they represent many of the evidence-based strategies related to students with severe disabilities at the sensorimotor stage of learning (Smith & Chambers, 2023; Smith et.al, 2020; Sutter & Demchak. 2023).

Reliability

Reliability refers to the "consistency or stability of the scores" produced by our research instruments (Christensen et al., 2015, p. 155). Cronbach's alpha (or coefficient alpha) was used in this investigation to determine the degree of internal consistency for the items and subscales

(Johnson & Christensen, 2014). Cronbach's alpha is appropriate for the current investigation because it can be used with dichotomous test items and test items that allow for a range of responses (Johnson & Christensen, 2014). Cronbach's alpha is commonly used by researchers (Johnson & Christensen, 2014, p. 169). A Cronbach's alpha of greater than or equal to .70 is generally acceptable for research purposes (Johnson & Christensen, 2014, p. 170). Alpha score results are reported in Chapter 4.

Validity

The two experts in the field of Adapted Physical Education with experience in the theory of planned behavior reviewed the PSP (Experts A and D) to establish content validity (Folsom-Meek & Rizzo, 2002; McNamara & Rizzo, 2023; Tripp & Rizzo, 2006). The experts were professors in adapted physical education and have experience with research designs within the theoretical framework of theory of planned behavior. The panel of experts provided recommendations for adjustments to support content validity. Each expert indirectly confirmed that the questionnaire continues to measure the direct (i.e., attitude, subjective norm, perceived behavioral control), indirect (i.e., behavioral beliefs, normative beliefs, control beliefs), intentions, and Service Provision behaviors (Jeong, 2008).

Confirmatory factor analysis (CFA) was the analytical method chosen for the original TBITSD to investigate construct validity. Jeong performed CFA with principal extraction method and varimax rotation on the nine items of direct measurement for the study sample (Jeong, 2008). This process indicated that nine direct measure items were effective indicators of the constructs (Jeong, 2008). Additionally, Jeong performed a CFA using a principal component extraction method and a varimax rotation on the belief strength items for each belief (Jeong,

2008) CFA was performed on 8 behavioral belief items, 6 normative belief items, and 9 control belief items.

CFA was considered to be utilized in this investigation as well to support the psychometric properties of the newly modified TBITSD (Jackson et al., 2009, p. 9). In addition, 5 APE service providers including 2 veteran specialists (more than 10 years of experience with APE specializations), 1 veteran generalist (more than 10 years of experience no specialization), 1 novice generalist (fewer than 10 years' experience no specialization), and 1 novice specialist (fewer than 10 years' experience with APE specialization) were asked to provide feedback on the final draft of the PSP to ensure the PSP terminology, questions, and structure of the PSP questionnaire reflected the current population rather than the original population of Korean physical education Teachers. A single APE service provider gave feedback regarding minor changes in wording for clarity and grammar usage. These changes were included in the final draft of the PSP.

Intervention Procedures

IRB approval was obtained in December 2023 and approved consent forms were completed by participants. Participants were provided a self-paced online professional development learning opportunity. This intervention provided the foundational knowledge and skills related to students at the sensorimotor stage of learning needed to implement a highly effective research-based strategy and evidence-based practices for these students.

Professional development is defined in Every Student Succeeds Act (2015) as activities that are ". . . intensive, collaborative, job-embedded, data-driven, and classroom focused" (ESSA, 2015, p. 296). This definition includes activities focusing on:

> ". . . (i) improving and increasing (II) understanding of how students learn… (v) support the recruitment, hiring, and training of effective teachers. . . (vi) advance teacher understanding of (I) effective instructional strategies that are evidence based . . . and (xii) are designed to give teachers of children with disabilities or children with developmental delays, and other teachers and instructional staff, the knowledge and skills to provide instruction . . ." (ESSA, 2015, p. 297).

In Texas, Subsection (d)(2) in the Texas Education Code outlines professional development requirements guiding districts to ". . . develop and maintain training" through ". . . consultation with persons with expertise in research based practices for students with disabilities" (Texas Education Code, 2021). The asynchronous self-paced professional development was created adhering to these requirements and guidelines.

Another consideration during the development of the professional development intervention module was how much time should be allocated to ensure effectiveness. Brown (2023) emphasized that ". . . professional learning isn't about finding a magical number of hours" (p.14). Brown (2023) explained the importance of ". . . placing a high value on formal and informal learning opportunities" through ". . . innovative models of professional learning" (p. 16).

Sensing and Learning Program

The asynchronous self-paced professional development was based on the researcher's professional development experiences with Millie Smith, a consultant for the American Printing House for the Blind. The learning opportunity with Smith was ongoing over three years. The researcher and other educators, who were part of the Instructional and Related Services team, were trained to use routines, a research based instructional strategy, with students at the

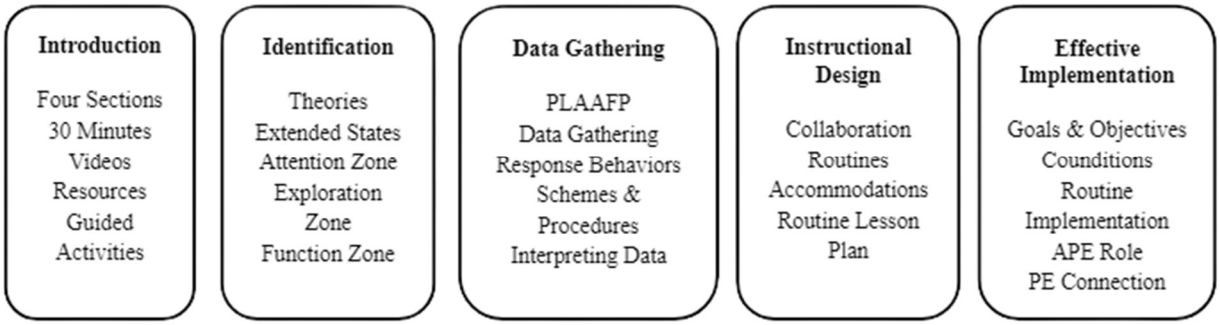
sensorimotor stage of learning. Evidence based practices were discussed and modeled for the team during the initial training. After the initial training, the team participated in a case study approach with students that were identified as sensorimotor stage learners. Monthly case study sessions occurred throughout the school year with Smith. These sessions included guided training focused on the development of an instructional routine based on informal assessment of each student. After the initial diagnostic phase, the team met each month with Smith to observe routine implementation either through direct observation or through recorded video. Smith guided the team through the process of learning to evaluate student engagement, making adaptations and modifications, understanding needed accommodations, and how to implement evidence-based practices to support student participation and performance. Throughout the ongoing training, data were collected and analyzed at the monthly training sessions. At the conclusion of the first year, the case studies conducted during the training were used by Smith to update her Sensory Learning Kit guidebook. The process resulted in the development of the Sensing and Learning program which is the foundation for this investigation's intervention.

The structure of the professional development is modeled after the training process experienced by the researcher. Resources and strategies for the professional development are included by the researcher to increase participants' understanding of the highly effective approaches needed to instruct students at the sensorimotor stage learner. The Sensing and Learning program was developed for instructional service providers including classroom teachers. While many of the instruments developed from the perspective of the teacher for learners with visual impairments, the Sensing and Learning program encourages a collaborative team approach for implementation. The team should include instructional and related staff members that teach and provide services for learners at the sensorimotor stage of learning. The

investigation's asynchronous self-paced professional development was developed with the audience of APE service providers in mind. Rather than presenting each of the instruments included in the program, the researcher provided guidelines for the type of data that would need to be collected. Further, the research-based instructional strategy (routines) and the evidence-based practices are presented as recommended by the Sensing and Learning program (Smith & Chambers, 2023). Prior to the start of the investigation, a panel of professionals reviewed the self-paced asynchronous professional development module to ensure content validity. An Adapted Physical Education Specialist, Expert A, and 2 consultants for the American Printing House for the Blind, Experts C and D, were included in the panel. The reviewers provided comments that resulted in changes in wording in the module, as well as, the addition of information about connecting to physical education curriculum and standards (see Figure 4; Appendix F).

Figure 4

Asynchronous Self-Paced Professional Development Section Overview



Introduction: Structure

The intervention was an asynchronous self-paced guided practice workbook which includes videos and resources embedded in the module. Participants were given a duration of 3-weeks to complete the asynchronous self-paced professional development module. Participants

with the opportunity to apply their learning to their current role as APE service provider in the digital guided practice workbook. The workbook included classroom practices that can be implemented in daily practice and instruction embedded within each section. Presented in the first section was the structure of the professional development module and the digital guided practice workbook. Additionally, the first section documented the researcher's experiences as an APE service provider and the background of the Sensing and Learning program development.

Identification of the Sensorimotor Stage Learner

The focus of the second section was on the identification of the sensorimotor stage learner. Participants were exposed to the theories and research that are foundational to developing the Sensing and Learning program. Participants were introduced to the response zones: Attention Zone, Exploration Zone, and Function Zone (Smith & Chambers, 2023, p. 3). The researcher explained and described the arousal states experienced by sensorimotor stage learners. Video examples of sensorimotor stage learners were included for participants to have a visual model of each response zone. Participants were guided to think of their current learners and apply the information from section two. Questions such as "Are you able to identify their ZPD?" and "Are your students participating in activities within or outside of their ZPD?" were included in the workbook.

Data Gathering: Creating a Present Level of Academic Achievement and Functional Performance Statement

The researcher highlighted APE formal and informal assessment options in the third section. Participants were introduced to the Sensing and Learning program. A general outline of the data gathering process was detailed including planning considerations. The authors of the Sensing and Learning program recommend collecting data through observations and teacher

interviews rather than formal assessments. Discussion of the sensorimotor exploratory schemes and procedures that participants would want to observe during their data gathering were included in this section. Participants were introduced to the terms *media* and *conditions*. The term *media* identifies the objects, people, and actions a sensorimotor stage learner demonstrates interest in or interaction with during the observation (Smith & Chambers, 2023). The *conditions* are the environmental factors that are present during the interaction (Smith & Chambers, 2023). Third, participants were guided through interpreting their data and using this information to develop a Present Level of Academic Achievement and Functional Performance statement for the sensorimotor stage learner.

Instructional Design: Teaching Strategies for Sensorimotor Stage Learners

The participants are introduced to the research based strategy sensorimotor routines in the fourth section. A sensorimotor stage learner routine is ". . . an attractive and consistent context in which the learner practices specific cognitive, communication, and motor skills" (Smith & Chambers, 2023, p. 58). The Sensing and Learning program categorizes accommodations into five categories. These accommodations are documented in the learners IEP to support participation in routines and activities. These accommodations facilitate access to the learning media and instruction. The participants were introduced to the Sensorimotor Routine Lesson Plan (SRLP). Scripting the routine is critical to ensure consistency of implementation. A key feature of the research based strategy is the routine must be presented the same way each and every time the sensorimotor stage learner participates in the routine. Additionally, the SRLP supports APE service provider needs to plan prior to instruction (Akuffo & Hodge, 2008; Ammah & Hodge, 2005). As the participants worked through the module, they were provided with the knowledge and understanding of the sensorimotor stage learner. This knowledge

supports the proficiency of APE service providers working with sensorimotor stage learners. Participants were provided videos and samples of a SRLP and were able to practice scripting a lesson plan in their workbook.

Effective Implementation: Writing Annual Goals and Objectives

The fifth and final section was so the participants could guide themselves through the process of writing goals and objectives for the sensorimotor stage learner and routine implementation guidelines. The goals and benchmarks writing process for the sensorimotor stage learner is very similar to the process for writing goals and benchmarks for all students with IEPs. Participants were guided through the process of taking the information from the observations, including the skills and conditions, and developing the goals and benchmarks. Additionally, participants were provided guidelines for routine implementation. APE providers were given options for their role in routine implementation (e.g., direct implementation, feedback through observation). Participants were provided considerations for connecting student skill levels to the physical education curriculum and standards. Prerequisite and foundational skills were provided for components of the Sensorimotor Scope and Sequence (Chambers & Smith, 2023) and participants were guided on how these skills could be documented in the student's goals and objectives. The workbook provided participants with many resources that could be reviewed to increase their understanding of conditions needed for the sensorimotor stage learner. Finally, the participants were reminded that routine instruction will always be a work in progress.

Throughout the asynchronous self-paced professional development module, participants were encouraged to apply the instructional practices with their current students. While application was not directly required, the intent of the asynchronous self-paced professional development module was to provide APE service providers with different instructional practices.

Questions in the workbook prompts participants to apply the concepts, strategies, and practices. Further, participants were prompted to reflect on their observation of current personal student performance.

Fidelity of Implementation

Fidelity of implementation of the intervention was ensured through the implementation of multiple choice questions at the end of each section. Multiple choice questions were used as required for professional development in Texas (Texas Education Agency, n.d.). The asynchronous self-paced professional development adhered to these suggested guidelines. These guidelines required three questions for each hour of expected professional development time. Additional feedback regarding the asynchronous self-paced professional development learning experience was gathered through informal interviews. The researcher planned to randomly select 10 of the participants and conducted interviews through a phone conversation. The interview comments were included to provide the researcher with feedback specific to the intervention which was the self-paced asynchronous professional development module and is included in Chapter 5.

Interview Process

As discussed previously, an interview protocol (See Appendix I) was developed following the guidelines for the standardized open-ended interview approach (Creswell & Creswell, 2018, Patton, 2015). This approach was chosen to ensure all participants were asked the same questions with minimal variation (Patton, 2015, p. 439-440). Additionally, this approach compensated for the researcher's limited interview administration experience and skill level by providing a script for the researcher to follow (Patton, 2015, p. 440). The interview protocol began with an introduction of the researcher, reminder of the purposes of the

investigation, and structure of the interview process (Christensen et al., 2015; Creswell & Creswell, 2018,). The interview participants were provided the opportunity to ask any questions prior to the interview. The opening question, "How would you describe your typical day as an Adapted Physical Education teacher?" was asked in attempt to establish rapport (Christensen et al., 2015; Creswell & Creswell, 2018; Gay et al., 2006). The interview consisted of 5 questions specific to gathering data on the participants' use of instructional strategies, perceptions of students with severe disabilities at the sensorimotor stage of learning, and level of confidence. Additionally, participants were provided with the opportunity to share their thoughts about the asynchronous self-paced professional development and ask questions (Patton, 2015). Participants were thanked for their participation and provided information regarding the storage of the data and when the data would be destroyed.

Data Analysis

Descriptive and inferential statistics were used for all data collected through the PSP pretest and posttest. The online platform, Qualtrics, was used to distribute consent forms, pretest PSP, posttest PSP, and compute some of the descriptive statistics. Data collected through Qualtrics were exported to IBM Statistical Package for Social Sciences (SPSS) to complete the remaining statistical analysis (e.g., Fisher's exact test, Spearman's correlation coefficient, paired sample *t* test, Wilcoxon signed rank test). Statistical analysis is completed through a paired samples *t* test when implementing a one-group pretest-posttest research design (JMP Statistical Discovery, 2023). The researcher used descriptive statistics to determine if the 3 assumptions: (a) the participants were independent and the measurements for one participant did not affect the measurements of any other participant, (b) the paired measurements were obtained from the same participant which was verified through each participants' random ID, and (c) the measured

differences were normally distributed were met in order to use the *t* test (JMP Statistical Discovery, 2023). When the assumptions were not met, the Wilcoxon signed rank test was determined to be a more appropriate test (McClenaghan, 2023). The investigation design included assigning a random ID for each participant. This number was used throughout the investigation to monitor participation, ensure anonymity, and match the pretest data with the posttest data for each participant. This allowed for the use of the paired sample *t* test or the Wilcoxon signed rank test for data analysis.

Descriptive statistics were used to analyze the specific demographic characteristics of the participants. Initially, the researcher planned to use the chi-square test of independence to examine relationships between various variables. Fisher's exact test rather than the Chi-square test was used to further investigate relationships between variables and to determine significance of these relationships due to the small sample size (Liddell, 1976). Additionally, Spearman's correlation coefficient test was performed to investigate correlations and significance of relationships between the categorical demographic variables. The practical significance was determined using Cohen's *d* (York, 2016). Responses to questions 51-58 gathered demographic and professional background characteristics including: degrees and certifications held, level of students that are being provided APE services, region, and years of experience as an APE service provider.

Research Question 1. Descriptive statistics were initially used to determine what preparation opportunities APE service providers have had to develop knowledge to provide services for students with severe disabilities at the sensorimotor stage of learning. Frequency and percentages were generated based on participant responses to questions number 51-65. These statistics described the number of undergraduate and graduate courses participants had attended

that addressed the needs of students with severe disabilities at the sensorimotor stage of learning. Additionally, these statistics described the number and type of professional development opportunities participants had attended related to adapted physical education in the past 3 years. A Fisher's exact test was used to determine if there were a relationship between the pre-service teacher preparation and in-service professional development opportunities for developing knowledge for providing APE services for students with severe disabilities at the sensorimotor stage of learning and demographic characteristics: type of degree, certification(s) held, and years of experience providing APE services.

Research Question 2. Descriptive and inferential statistics were used to determine the self-reported changes in APE service providers' perceptions toward students at the sensorimotor stage of learning following the asynchronous self-paced professional development module focused on sensorimotor stage instructional strategies. Descriptive statistics were used to calculate frequency and percentages for PSP pretest questions 10, 15, 16, 34, 41-44, and 45-48. Next, the researcher used descriptive statistics to determine whether the three assumptions were met to use a paired sample *t* test to analyze the data collected in PSP pretest and posttest questions. The pretest and posttest data for questions that met all assumptions were analyzed using a paired samples *t* test to determine whether there were significant differences. Further, the pretest and posttest data for each question that did not meet all assumptions were analyzed using a Wilcoxon signed rank test to determine whether there were significant differences. The practical significance was determined using Cohen's *d* (York, 2016). Statistical analysis was set at *p* values for all alpha less than .05.

Research Question 3. Descriptive and inferential statistics were used to determine the changes in APE service providers' self-reported level of confidence after participation in the

asynchronous professional development module focused on sensorimotor stage instructional strategies. Descriptive statistics were used to calculate frequency and percentages for PSP pretest and posttest questions 7-9 and 11. Next, the researcher used descriptive statistics to determine whether the three assumptions were met to use a paired sample t test to analyze the data collected in PSP pretest and posttest questions. The pretest and posttest data for questions that met all assumptions were analyzed using a paired samples *t* test to determine whether there were significant differences. Further, the pretest and posttest data for each question that did not meet all assumptions were analyzed using a Wilcoxon signed rank test to determine whether there were significant differences. The practical significance was determined using Cohen's *d* (York, 2016). Statistical analysis was set at *p* values for all alpha less than .05.

Research Question 4. Descriptive and inferential statistics were used to determine the changes in APE service providers' self-reported implementation of highly effective instructional strategies after completing the asynchronous self-paced professional development module focused on sensorimotor stage instructional strategies. Descriptive statistics were used to calculate frequency and percentages for PSP pretest question 50 for each of the 16 research-based strategies, evidence-based practices, accommodations, and modifications. Further, descriptive statistics were used to calculate frequency and percentages for PSP posttest question 50 for each of the 16 research-based strategies, evidence-based practices, accommodations, and modifications.

Next, the researcher analyzed the data for each of the 16 research-based strategies, evidence-based practices, accommodations, and modifications to determine if the three assumptions were met: (a) the participants were independent and the measurements for one participant did not affect the measurements of any other participant, (b) the paired measurements

were obtained from the same participant which was verified through each participants' random ID, and (c) the measured differences were normally distributed. Using the features of descriptive analysis in SPSS, the researcher determined which of the 16 strategies, practices, accommodations, and modifications met all three assumptions. These research-based strategies, evidence-based practices, accommodations, and modifications were analyzed using a paired samples *t* test to determine whether there were significant differences. This was followed by using Cohen's *d* to determine practical significance. Statistical analysis was set at *p* values for all alpha less than .05. A Wilcoxon signed rank test was used to determine whether there were significant differences for research-based strategies, evidence-based practices, accommodations, and modifications that did not meet the assumption criteria for the paired samples *t* test. The practical significance was determined using Cohen's *d* (York, 2016). Statistical analysis was set at *p* values for all alpha less than .05.

Threats to Validity

In the present investigation, the use of the pretest-posttest one group design was chosen based on the challenges commonly encountered in educational research. Research data regarding the common characteristics (e.g., education, experience, pedagogy knowledge) of the APE service provider's population in Texas is a challenge to analyze due to the yearly changes in staff. Therefore, making it difficult to address the issue of participant variable control (Gay et al., 2006, p. 236). Additionally, the relatively small accessible population presented a challenge when considering using a true experimental design (i.e., pretest-posttest control group design). Dividing the small accessible population into two groups would result in groups smaller than typically called for by research standards (Gay et al., 2006, p. 110).

The asynchronous self-paced professional development module intervention that was developed by the researcher for this investigation was not implemented prior to this investigation. Thus, baseline data on the response to the intervention has not been collected. Additionally, the limited accessible population restricted pilot study implementation opportunities. Using a pilot study to collect baseline data would have given the researcher baseline data, however, the accessible population would be decreased for future investigations.

Gay et al. (2006) identified two common challenges encountered during educational research. The first challenge highlights the need for sufficient exposure to the intervention (Gay et al, 2006, p. 235). The researcher investigated current professional development modules and noted that these modules were similar in structure to the current intervention but not content. Participants in the *Administration and Interpretation of the Southern California Ordinal Scales of Development - Cognition* (Glamore, 2023) hybrid training were provided 3 weeks to complete 8 recorded webinars including a total of 577 minutes (9.62 hours) of videos focused on training for administration of an assessment. In the current investigation, participants were asked to complete a 120 minutes (2 hours) of reading and viewing videos within 3 weeks. While this time is sufficient and appropriate for the population, the exposure to the information is dependent on the participant.

The second challenge highlighted by Gay et al. (2006) is the need for treatments (e.g., interventions) to be substantively different (p. 235). The researcher considered the addition of a live video chat to differentiate between the original intervention and the addition of a different intervention. This consideration was based on the researcher's experience with similar professional development modules that included a live video chat session. However, the

researcher determined extending the duration of expected participation time would discourage participant participation in the investigation.

Due to the limited accessible population, the possibility of overexposure to the material during a pilot study, the lack of baseline data regarding the intervention and consideration of the previously discussed factors, the researcher determined the pretest-posttest one group design to be the most appropriate for the investigation. While the pretest-posttest one group design is considered a weak research design, it is useful for use during a preliminary investigation of a problem (Gay et al., 2006). The self-paced asynchronous professional development module, which was the *Sensorimotor Guided Practice Workbook*, had not previously been investigated. One of the researcher's purpose for the present investigation was to explore the self-reported use of highly effective instructional strategies used by APE service providers before and after the intervention. Thus, the present investigation was a considered a preliminary investigation (Gay et al., 2006).

Alternative explanations specific to the pretest-posttest one group design that are considered threats to internal validity include: history, maturation, testing, instrumentation, regression to the mean, and spontaneous remission (Gay et al., 2006). As discussed previously, the researcher investigated similar training modules to identify the current state of professional development. The *Administration and Interpretation of the Southern California Ordinal Scales of Development – Cognition* (Glamore, 2023) hybrid training included 3 weeks of recorded webinars and an additional week devoted to live video chat meetings. Conversely, the self-paced online training *A Step Toward IEP Quality and Rigor* (Texas Education Agency, 2023) through the Texas Education Agency (TEA) provided no timeline for completion.

Additionally, participants were provided instant access to the initial questionnaire after submitting consent. Upon completion of the questionnaire, which included mostly rating scales, the participants were provided instant access to the professional development module. Finally, upon completion of the professional development module, participants were provided instant access to the final questionnaire. The researcher determined the time period of a total of 6 weeks to be an appropriate time for completion of the investigation components based on the previously discussed factors. A longer expected duration of participation time could have discouraged potential participants. Additionally, the 6 weeks total participation time limited the opportunity for other events (e.g., additional professional development, illness, pandemic) to impact the effectiveness of the investigation (Gay et al., 2006). This process limited the effects of history and maturation that could occur during the investigation.

Pretest sensitization was identified by Gay et al. (2006) as another threat to interval validity when implementing the pretest-posttest design (p. 239). The authors emphasized that this is more applicable to studies that require the participant to recall factual information (Gay et al., 2006). Gu et al. (2021) investigated the process of using difference scores to measure change in behavioral items. The researcher compared the traditional method of estimating difference score reliability with the less known item-level method (Gu et al, 2021, p. 593). When describing the item-level method, the authors notated that each difference score is ". . . conceived as an independent measure of change" (p. 596). Further, the author stressed that the difference scores were gathered under similar conditions which limits the impact of carryover effects (Gu et al, 2021, p. 596).

The final threats to validity considerations (i.e., instrumentation, statistical regression, spontaneous remission) were limited through the research project design. The pretest and posttest

questionnaires were identical except for the demographic and experience information that was collected in the pretest. The demographic and experience information were not collected again in the posttest questionnaire because the researcher expected little to no changes to occur within the duration of the investigation. Additionally, excluding the demographic and experience information substantially decreased the amount of time required to complete the posttest questionnaire. This was an important consideration to increase the number of participants who completed the investigation process.

Inclusion of participants in the investigation was not based on the pretest scores which could result in statistical regression and differential selection of participants (Gay et al., 2006, pp. 239-240). Finally, to the knowledge of the researcher, the information provided in the self-paced asynchronous professional development module is not provided in professional development opportunities currently accessible to APE service providers.

Other Considerations and Limitations

While the addition of participant interviews has advantages, it also has some disadvantages including interviewer effects (e.g., the interviewer's presence may elicit bias responses; Creswell & Creswell, 2018, p. 188). An additional consideration was some participants may have difficulty articulating their thoughts and perceptions (Creswell & Creswell, 2018).

Summary

The theory of planned behavior was used in the present investigation as the theoretical framework to investigate new APE instructional practice information through professional development on current APE service provider's perceptions and confidence. According to Guskey (2002) teachers' beliefs change when teachers see improved student outcomes (p. 383).

Student outcomes improve when new instruction practices are implemented (Guskey, 2002, p. 383). The researcher implemented a pretest-posttest one group research design to provide a preliminary investigation into the current state of APE service specifically regarding students with severe disabilities at the sensorimotor stage of learning (Gay et al., 2006, p. 250). The lack of availability of professional development focused on learners at the sensorimotor stage of development supports appropriateness of the research design because the APE service providers' perceptions are unlikely to change without intervention (Gay et al., 2006, p. 253). Therefore, the present investigation provided participants with a self-paced asynchronous professional development learning opportunity that gives practical strategies that could be implemented in their current position. The PSP was used to collect data before and after the professional development module to measure the changes perceptions and confidence of participants. In Chapter 4, the data will be presented and interpreted.

CHAPTER 4

Data Analysis

The investigation used a one-group pretest-posttest research design to investigate current Adapted Physical Education (APE) service providers perceptions of students at the sensorimotor stage of learning and self-reported changes in the use of research-based strategies and evidence-based practices after a self-paced asynchronous professional development learning experience. The investigation was guided by the following research questions:

1. What preparation opportunities have APE service providers had to develop knowledge to provide services to students with severe disabilities at the sensorimotor stage of learning?
2. What are the self-reported changes in APE service providers' perceptions toward students at the sensorimotor stage of learning following an asynchronous professional development module focused on sensorimotor stage instructional strategies?
3. What are the changes in APE service providers' self-reported level of confidence after participation in an asynchronous professional development learning module?
4. How will APE service providers self-reported implementation of highly effective instructional strategies (Smith & Chambers, 2023) change after completing an asynchronous professional development learning module?

The researcher used the quantitative data collected through the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP; see Appendix A) pretest and posttest from the 29 participants in the investigation to address the four research questions that guided the investigation. The researcher identified the pre-service teacher preparation and in-service staff development opportunities related specifically to gaining knowledge about students at the sensorimotor stage of learning. Data on

participant's changes in perceptions of students at the sensorimotor stage of learning, perceived level of confidence, and implementation of highly effective instructional strategies (Smith & Chambers, 2023) were analyzed before and after participating in the self-paced asynchronous professional development created by the researcher. A follow-up interview was planned to be conducted with 10 randomly selected participants to provide supplementary descriptive comments regarding the self-paced asynchronous professional development. The interview participants are referred to as "APE" with an assigned number 1-10. The following sections in this chapter present the results of the data analysis. Described in the initial section are the demographic information of the investigation participants. The following sections present the data for each of the research questions. Additionally, participant interview comments are reviewed. Finally, a summary of the findings for each research question is presented.

Demographic Information

Participants

A total of 29 individuals who currently provided Adapted Physical Education (APE) services participated in this investigation. The Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learner's Service Provision (PSP) pretest questions 51-65 collected general demographic information (e.g., gender, age, and ethnicity). Additionally, the PSP pretest focused on collecting information about participant's educational background, professional certifications, level of student Service Provision, regional representation, and experience (see Table 6).

Female participants in the investigation outnumbered the males approximately three to one. Participants' ages (*M* age = 40.53, *SD* = 10.13, range = 23 to 60) were 18% age 20 to 29; 29% age 30 to 39; 36% age 40 to 49; and 18% were more than 50 years old. The majority of

participants reported the Caucasian ethnicity. When asked about participation in highest degree programs, the majority of participants indicated participation in a master's degree program (72%). Participants (n = 10) who reported undergraduate degree majors of investigation were fairly evenly divided across 4 undergraduate academic fields. Undergraduate degree majors were Exercise (Sports) Science (20%); Physical Education (20%); Kinesiology (20%); Special Education (20%); Music Therapy (10%); BS (10%); and BA (10%). Over half of the total participants (n = 15) indicated a master's degree in the field of Kinesiology (60%). Additional master's degree majors were Adapted Physical Education (26%); Special Education (6%); and Curriculum (6%).

When asked about what level of students each provided APE services, the majority provided services for students in elementary school (97%) and middle school (93%). Additionally, most participants reported providing APE services for high school students (86%). Further, few participants indicated providing APE services for students in preschool (n = 11) or for adult learners who were 18 years or older and were still receiving special education services (n = 8).

Most participants represented the Region 10 Educational Service Center geographical area. An equal number of participants (n = 9) indicated providing services for 1 to 3 years (35%) and more than 10 years (35%). Interestingly, the researcher determined the majority of participants had provided APE services for 6 or fewer years (65%) and the remaining 9 participants had provided services for 10 or more years (35%).

Table 6

Participant Demographic Variables

Variable	Number of Participants (%*)
Gender (*n* = 29)	
Female	23 (79)
Male	5 (17)
Prefer not to say	1 (3)
Ethnicity (*n* = 29)	
American Indian or Alaska Native	1 (3)
African American	0 (0)
Native Hawaiian or Other Pacific Islander	0 (0)
Asian	0 (0)
Hispanic or Latino	5 (17)
Caucasian	23 (59)
Other	0 (0)
Degree (*n* = 28)	
Undergraduate	6 (21)
Master's Program	20 (72)
Doctoral Program	2 (7)
Teaching Certification (*n* = 29)	
Certified Adapted Physical Education	15 (52)
Physical Education	22 (76)
Special Education	22 (76)
Other	8 (28)
Level of Students Providing APE Services (*n* = 29)	
Preschool	11 (38)
Elementary	28 (97)
Middle School	27 (93)
High School	25 (86)
18+Adult Learners	8 (28)
Regional Representation (*n* = 29)	
Region 10	19 (66)

Region 11	7 (24)
Region 20	1 (3)
Other - Region Not Specified	2 (6)
Years of Providing APE Services (n = 26)	
1-3 years	9 (35)
4-6 years	8 (31)
7-10 years	0 (0)
More than 10 years	9 (35)

Note. * The number of respondents varied because of omitted responses.

Preservice Preparation and In-Service Professional Development

The final section of demographic information collected through the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learner's Service Provision (PSP) pretest focused on participants' pre-service preparation and in-service professional development opportunities (see Table 7). Participants provided information about the number of undergraduate and graduate courses taken in special education or physical education that provided course content to address the needs of students at the sensorimotor stage of learning. Additionally, participants provided the number of professional development (PD) opportunities (e.g., in-service programs, workshops, conferences) attended in the past 3 years. Participants identified the format of the PD opportunities attended out of the choices given. Finally, participants were asked to rate how much the courses and PD opportunities helped to prepare them for working with students with severe disabilities at the sensorimotor stage of learning.

College Courses

The researcher asked participants to report the number of undergraduate and graduate courses taken specifically addressing the needs of students with severe disabilities at the sensorimotor stage of learning to better understand the opportunities for developing knowledge to provide services for students with severe disabilities at the sensorimotor stage of learning. The

results are provided in Table 7. Of the 28 participants who responded to the question "How much do you think this course or courses have helped prepare you to provide APE services for students like Taylor and Alex?," 32% (*n* = 9) responded with a neutral response (4). Six participants responded, "Strongly Disagree" (21%) and 3 participants responded, "Strongly Agree" (11%). When asked the question "How much do you think this course or courses have helped prepare you to provide APE services for students like Taylor and Alex?," an equal number of participants (*n* = 5) responded "Strongly Disagree" (32%) and "Strongly Agree" (32%). The majority of participants (7; 25%) rated their level of preparation by their graduate courses at a response rate of 5.

Professional Development

The researcher asked participants to report the number of professional development opportunities attended specifically addressing the needs of students with severe disabilities at the sensorimotor stage of learning to gain better insight into the opportunities for developing knowledge to provide services for students with severe disabilities at the sensorimotor stage of learning. The results are provided in Table 7. Participants were given the opportunity to identify other professional development opportunities related to students with severe disabilities at the sensorimotor stage of learning. Two participants reported hands on learning professional development opportunities at Regional ESC facilities, specifically the *No Limits* event held at Region 10 ESC. One participant indicated having no professional development opportunities specifically related to students with severe disabilities at the sensorimotor stage of learning.

When asked to rate how these professional development opportunities helped prepare them to provide APE services for students with severe disabilities at the sensorimotor stage of learning, the majority (28%) of participants rated the professional development opportunities at a

response rate of 5. Seven participants (24%) responded with a neutral response (4). Six participants responded, "Strongly Agree" (21%).

Table 7

Preservice and In-service Variables

Variable	Number of Participants (%*)
No. of undergraduate courses taken in special education or physical education that address the needs of students at the sensorimotor stage of learning (n = 29)	
None	5 (17)
One	12 (41)
Two or more	12 (41)
No. of graduate courses taken in special education or physical education that address the needs of students at the sensorimotor stage of learning (n = 22)	
None	4 (18)
One	2 (7)
Two or more	17 (77)
No. of workshops, conferences, and in-service programs related to physical education for students at the sensorimotor stage of learning in the past 3 years (n = 29)	
0-4	23 (79)
5-8	4 (14)
9 or more	2 (7)
Format of PD attended (n = 28)	
District or regional workshop on sensorimotor stage learning.	20 (71)
Regional APE conference session focused on sensorimotor stage learning.	16 (57)
National or state APE conference session focused on sensorimotor stage learning.	4 (14)
Formal college/university course on teaching students at the sensorimotor stage of learning.	3 (11)
Observation of other APE service providers as part of your own professional development/mentoring (formal or informal).	15 (54)
Formal or informal collaboration with other APE service providers (Professional Learning Community).	19 (69)
Other (Not specified)	1 (4)

Note. * The number of respondents varied because of omitted responses.

RQ 1 Quantitative Results

Participants identified opportunities for acquiring and building knowledge about Adapted Physical Education (APE) Service Provision for students at the sensorimotor stage of learning by reporting the number of courses and professional development (PD) opportunities. This information is foundational to developing an understanding of participants' current perceptions of students with severe disabilities at the sensorimotor stage of learning. Further, this information identifies the learning opportunities participants have available for learning instructional practices and strategies related to students with severe disabilities as the sensorimotor stage of learning. The researcher used descriptive statistics and visual representations to analyze the data collected through the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learner's Service Provision (PSP) pretest questions 51-65. Initially, the researcher planned to use the chi-square test of independence to examine relationships between various variables. Fisher's exact test rather than the Chi-square test was used to further investigate relationships between categorical variables and to determine significance of these relationships due to the small sample size (Liddell, 1976). The researcher used the results of these analyses to answer the first research question.

Adapted Physical Education Service Providers Opportunities to Develop Knowledge

RQ 1. What preparation opportunities have APE service providers had to develop knowledge to provide services to students with severe disabilities at the sensorimotor stage of learning?

The demographic information collected through the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learner's Service Provision (PSP) pretest

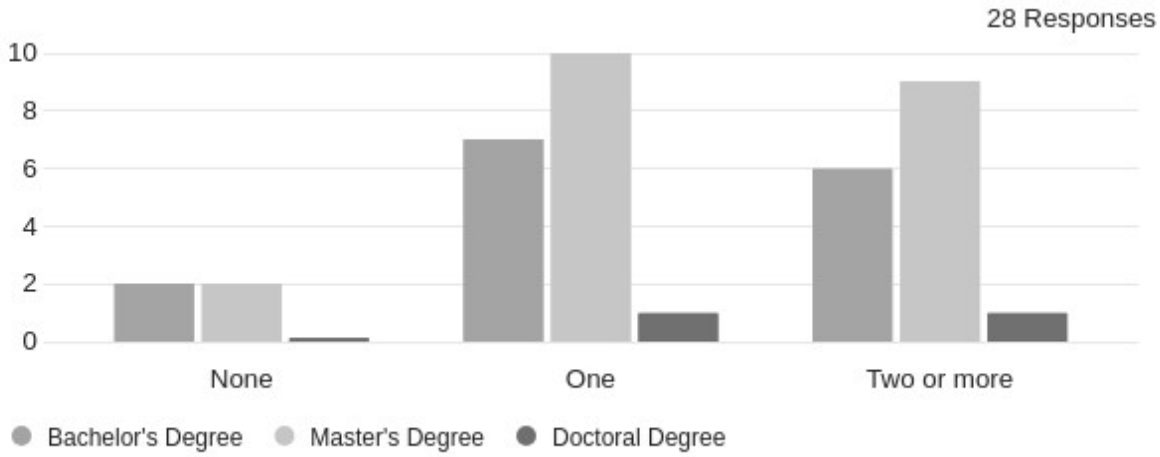
identified that all participants had completed a bachelor's level degree program and the majority of participants had participated in a master's level degree program (72%). Additionally, the PSP collected information regarding the number of undergraduate and graduate level courses taken related to addressing the needs of students at the sensorimotor stage of learning. Further, participants reported the number of workshops, conferences, and in-service PD attended as well as the format for these opportunities. In order to investigate the significance of the relationships explored regarding the number of courses attended and various participant demographic variables, the researcher performed the Fisher's exact test (Liddell, 1976). The researcher used this information to develop a better understanding of participants' current perceptions of students with severe disabilities at the sensorimotor stage of learning and the participant's use of instructional practices and strategies related to students with severe disabilities as the sensorimotor stage of learning.

Number of Undergraduate and Graduate Courses

When examining the relationship between the number of undergraduate courses and level of degree (i.e., bachelor's degree, master's degree, see Figure 5), the results of the Fisher's exact test ($p = .077$) did not indicate a significant association between the number of undergraduate courses and the level of degree. However, it is worth noting that while the relationship was not significant relative to the standard alpha level of .05 the p value was less than .10 when examining this relationship. Additionally, Fisher's exact test give exact p-values however, the relevant literature reflects a view that the Fisher's exact test is more conservative and results in a lower null hypothesis rejection rate due to the conditions of the Fisher's exact test margins (Liddel, 1976).

Figure 5

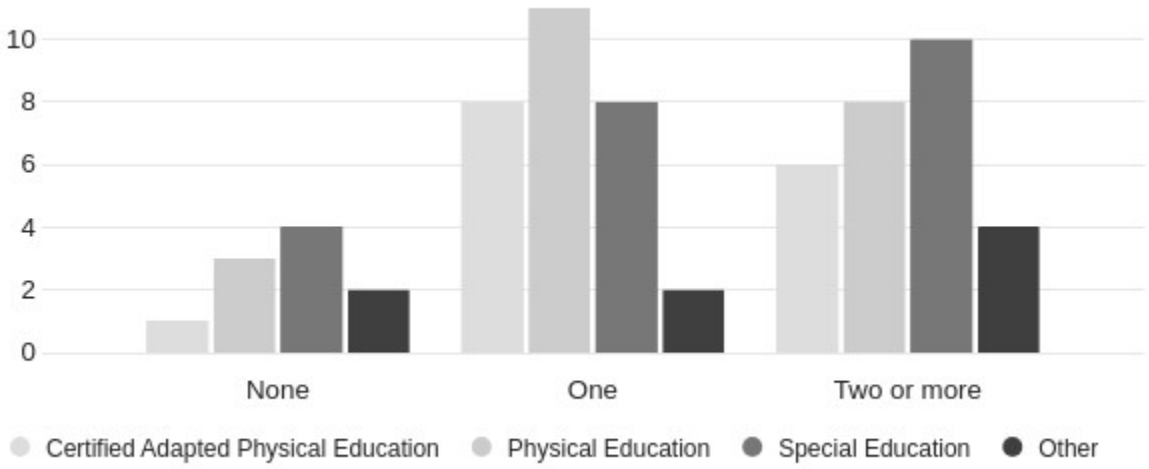
Comparison of Degree Program and Number of Undergraduate Courses Attended



The majority of participants were certified in physical education (76%) and special education (75%). Further, slightly over half of the participants (52%) had completed the requirements to be recognized as a Certified Adapted Physical Educator (CAPE). Most but not all participants who held a CAPE also had a master's degree. Therefore, the researcher compared the number of undergraduate courses taken addressing the needs of students at the sensorimotor stage of learning with the types of certifications held (see Figure 6). The visual representation of the data indicated that the majority of participants with a certification in physical education (n = 11) reported taking one course addressing the needs of students at the sensorimotor stage of learning. Interestingly, the majority of participants with a CAPE recognition (n = 8) also reported taking only one course addressing the needs of students at the sensorimotor stage of learning.

Figure 6

Comparison of Certifications and Undergraduate Courses



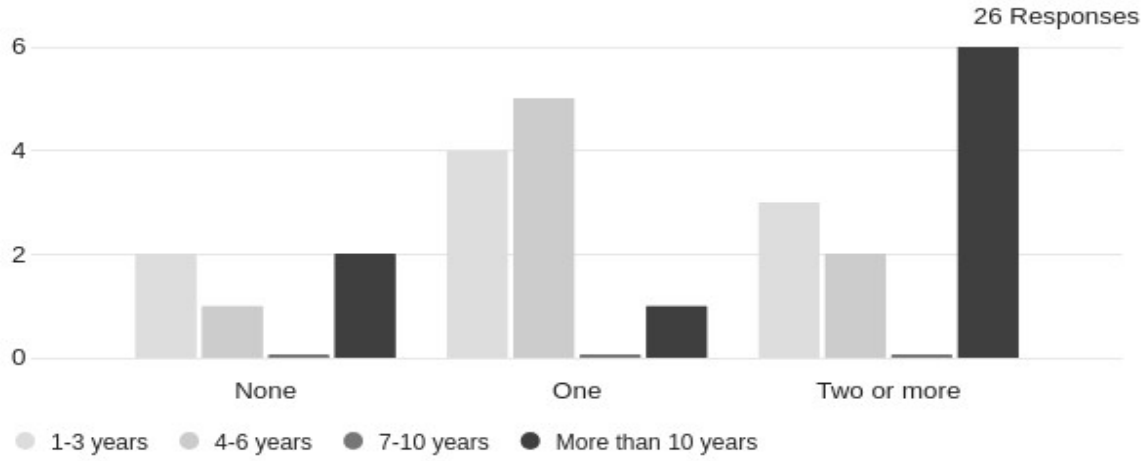
Next, the researcher examined the relationship between the number of undergraduate courses and teacher certifications by performing a Fisher's exact test. The sample was comprised of participants with certifications in special education, physical education, and participants who held certifications in both special education and physical education. The Fisher's exact test results (p = .137) did not indicate a significant association between the number of undergraduate courses and the type of certification. Additionally, to gain better insight into the relationship between the number of graduate courses addressing the needs of students at the sensorimotor stage of learning and participants CAPE recognition the researcher performed Fisher's exact test. The Fisher's exact test results (p = .477) did not indicate a significant association between the number of graduate courses attended and the CAPE recognition.

Further, the researcher examined the relationship between the number of years of experience as an APE service provider and the number of undergraduate courses addressing the needs of students at the sensorimotor stage of learning (see Figure 7). The visual representation

indicated that participants who have provided APE services for 10 or more years reported taking two or more courses (n = 6) which was twice as many as participants who have provided APE services for 1 to 3 years (n = 3). Participants who have provided services for 4 to 6 years were more likely to have only one course (n = 5).

Figure 7

Comparison of Years of Service Provision and Undergraduate Courses



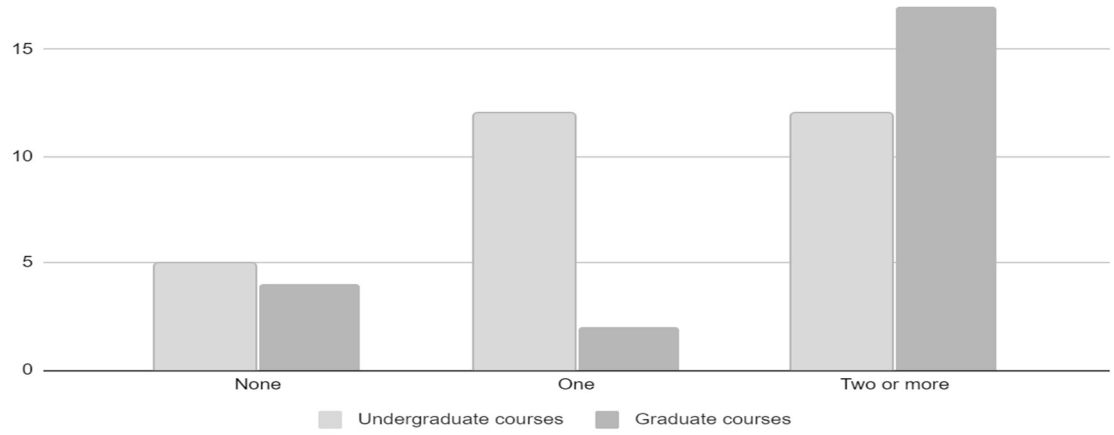
Finally, the researcher examined the relationship between the number of undergraduate courses and participants' years of service (i.e., 1-3 years, 4-6 years, more than 10 years) by performing the Fisher's exact test. The results of the Fisher's exact test (p = .133) did not indicate a significant association between the number of undergraduate courses and the years of service for participants. However, the visual representation shows a distinct increase in the number of courses taken by participants with more than 10 years of experiences compared to those with fewer years of experience (see Figure 7).

College Courses and Preparedness

As displayed in Table 7, slightly fewer than half of participants (n = 12) reported taking two or more undergraduate courses in either special education or physical education that addressed the needs of students at the sensorimotor stage of learning. In contrast, over half of the participants (n = 17) reported having two or more graduate courses in either special education or physical education that addressed the needs of students at the sensorimotor stage of learning. Only 4 participants reported taking no graduate courses (18%) focused on addressing the needs of students at the sensorimotor stage of learning (see Figure 8).

Figure 8

Number of Courses That Address Students at the Sensorimotor Stage of Learning' Needs

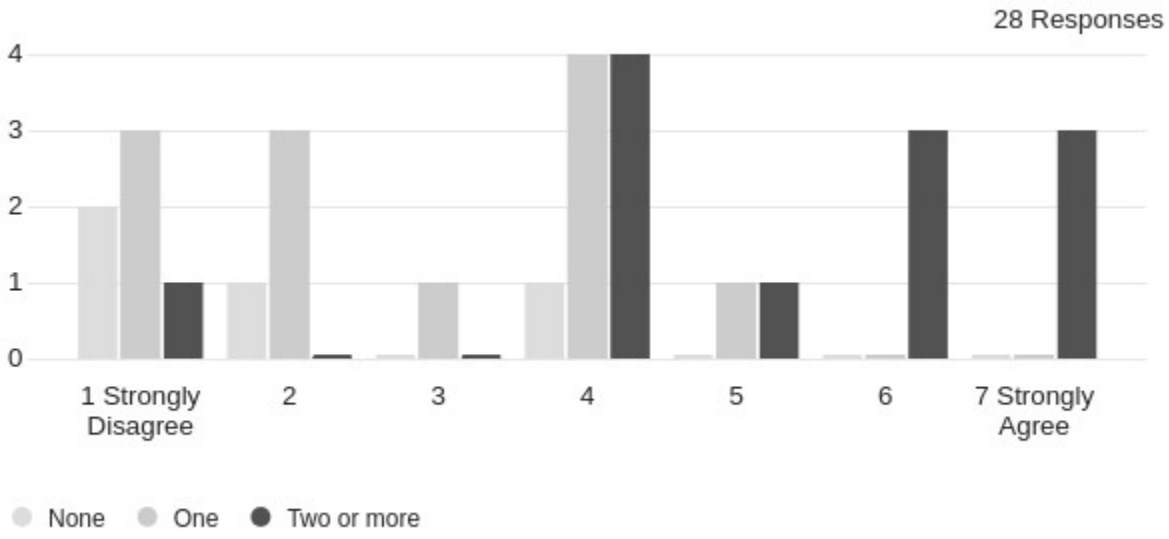


In order to better understand how the undergraduate courses prepared pre-service APE service providers for teaching students with at the sensorimotor stage of learning, the researcher examined the participants reported ratings related to the number of courses attended (see Figure 9). The majority of the participants who reported attending one course (n = 12) related to addressing the needs of students at the sensorimotor stage of learning reported negative

experiences. One participant rated their experience slightly above a neutral response. Conversely, participants who had attended two or more courses reported positive experiences.

Figure 9

Comparison of Undergraduate Courses and Preparedness Ratings



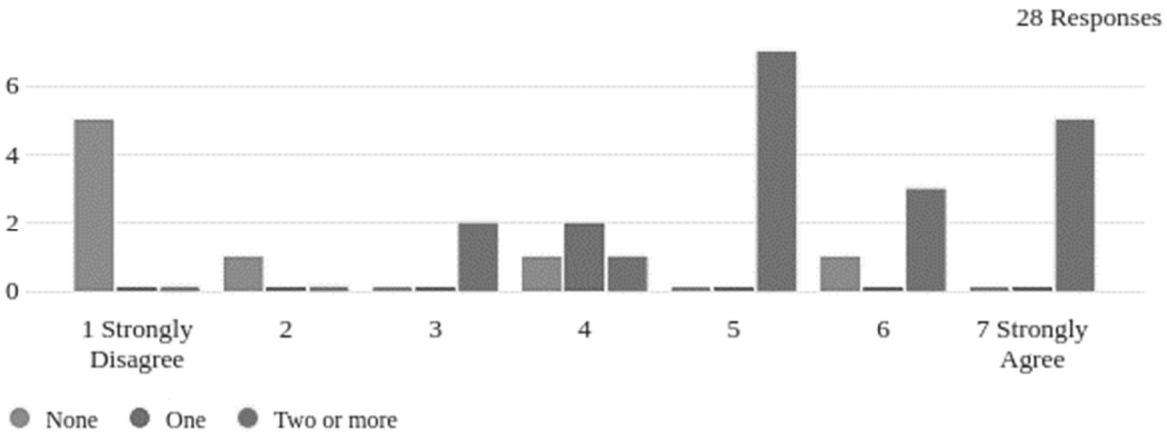
In order to gain better insight into the possible correlation between the number of undergraduate courses attended and participants' ratings of preparedness, the researcher performed a Spearman's correlation coefficient. First, the researcher used a scatter plot generated from the data to verify the assumptions for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the number of undergraduate courses attended and participants' response ratings were examined. There were positive and significant correlations between the number of undergraduate courses attended and participants' response ratings, $r_s = .629$, $n = 28$, $p < .001$.

When examining how the graduate courses prepared participants for teaching students at the sensorimotor stage of learning, fewer participants responded with a neutral rating (see Figure

10). The majority of participants who had taken two or more courses related to teaching students at the sensorimotor stage of learning rated these courses with positive ratings with only 2 participants rating slightly lower than neutral.

Figure 10

Comparison of Graduate Courses and Preparedness Ratings



As done previously, the researcher performed a Spearman's correlation coefficient to gain better insight into the possible correlation between the number of graduate courses attended and participants' ratings of preparedness. The researcher used a scatter plot generated from the data to verify the assumptions for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the number of graduate courses attended and participants' response ratings were examined. There were positive and significant correlations between the number of graduate courses attended and participants' response ratings, $r_s = .674$, $n = 22$, $p < .001$.

Number of Professional Development

In order to better understand the relationship between participants' demographic variables and the number and format of professional development opportunities, the researcher used

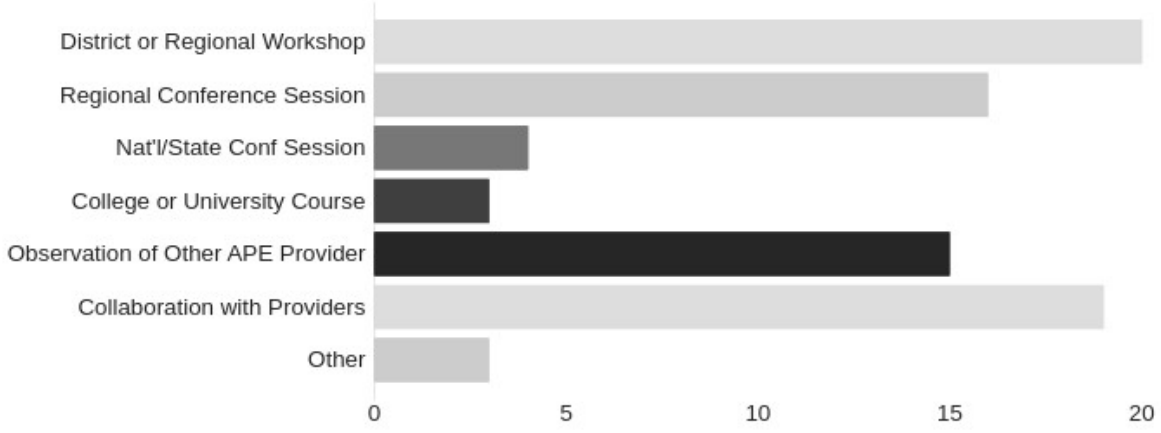
descriptive statistics and Fisher's exact test. The researcher used this information to gain insight into participants' current perceptions of students with severe disabilities at the sensorimotor stage of learning and to identify the learning opportunities participants have available for learning instructional practices and strategies related to students with severe disabilities as the sensorimotor stage of learning. When examining the significance of the relationship between the number of professional development sessions attended in the past 3 years and the highest degree held, the results of the Fisher's exact test (p = .498) did not indicate a significant association between the number of PD sessions attended and the level of degree. Next, the researcher examined the relationship between the number of professional development sessions attended in the past 3 years and the types of certification held, the results of the Fisher's exact test (p = .834) did not indicate a significant association between the number of PD sessions attended and the type of certification held. Further, the researcher examined the relationship between the number of professional development sessions attended in the past 3 years and the number of years providing APE services, the results of the Fisher's exact test (p = .845) did not indicate a significant association between the number of PD sessions attended and the number of years providing APE services. Finally, the researcher examined the relationship between the number of professional development sessions attended in the past 3 years and the participants reported Region, the results of the Fisher's exact test (p = .053) did not indicate a significant association between the number of PD sessions attended and the reported Region. However, it is worth noting that while the relationship was not significant relative to the standard alpha level of .05 the p value was less than .10 when examining this relationship.

Professional Development and Preparedness

The researcher explored participants' self-reported preparedness related to the format of professional development attended. The researcher used this information to better understand participants' current perceptions of students with severe disabilities at the sensorimotor stage of learning. Additionally, the researcher used this information to describe the learning opportunities participants have available for learning instructional practices and strategies related to students with severe disabilities as the sensorimotor stage of learning. The majority of participants (n = 20) reported attending a workshop focused on students at the sensorimotor stage of learning at their District or Regional ESC (see Figure 11). Further, over half the participants (n = 16) attended a Regional APE Conference session focused on students at the sensorimotor stage of learning. Few participants reported attending a session at a national or state level conference. Over half of the respondents reported observing other APE service providers and collaboration with other APE service providers (e.g., Professional Learning Community).

Figure 11

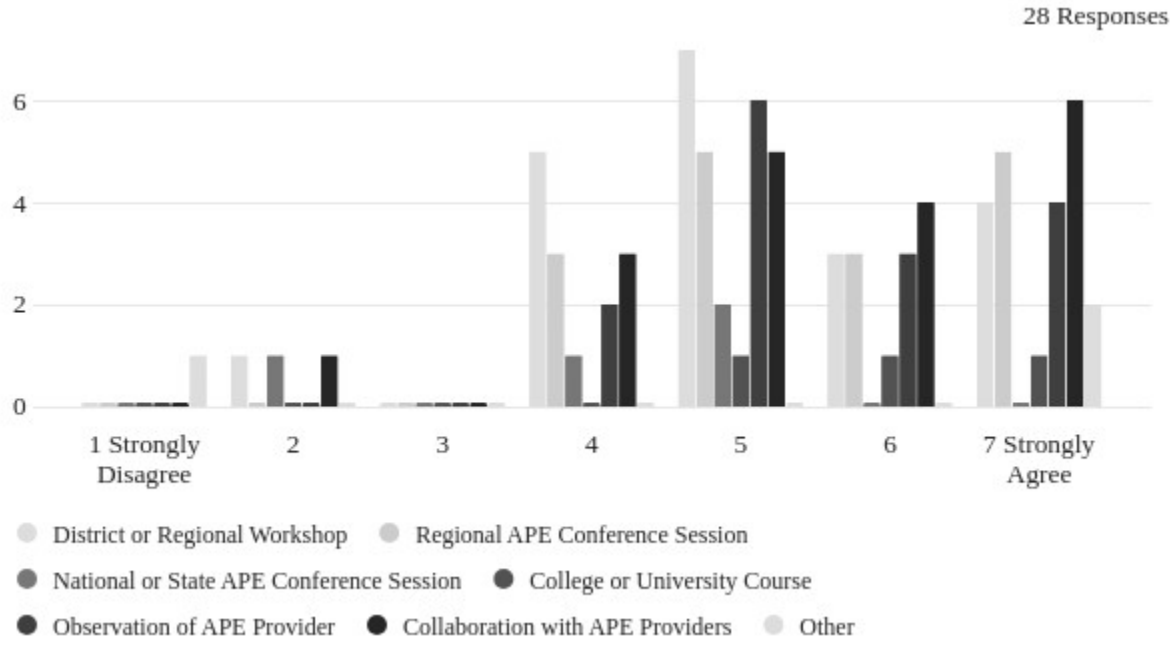
Professional Development Formats



To better understand how these professional development opportunities prepared in-service APE service providers for teaching students with disabilities at the sensorimotor stage of learning, the researcher examined the participants reported ratings related to the format of the PD attended (see Figure 12). Participants were allowed to enter multiple responses. The majority of participant responses rated their PD opportunities positively (62 total responses). Participants rated collaboration with other APE service providers highest with 6 participant responses indicating "strongly agree" that the experience prepared them to teach students at the sensorimotor stage of learning. Further, 5 participant responses indicated "strongly agree" that attendance at a district or regional workshop was beneficial in preparing them to teach students at the sensorimotor stage of learning. While some respondents chose to use a neutral response rating (4, 14 total responses), very few participant responses (4 total responses) rated their PD opportunities negatively.

Figure 12

Comparison of PD Formats and Preparedness



When examining the relationship between the format of professional development attended in the past 3 years and participant demographic variables, the researcher performed the Fisher's exact test with each format attended and the specific demographic variables. The relationship between attending a regional conference session focused on students at the sensorimotor stage of learning and level of degree held indicated a significant relationship. The results of the Fisher's exact test (p = .036) indicated a significant association between attending a regional conference session and the level of degree held. Additionally, attending a national or state APE conference session focused on students at the sensorimotor stage of learning and the number of undergraduate courses (p = .054) and participating in formal or informal collaboration with other APE service providers and number of years of experience (p = .059) were slightly out of the range of significance. However, it is worth noting that while the relationships were not significant relative to the standard alpha level of .05 the p value was less than .10 when examining this relationship.

Participants reported all PD formats focused on students at the sensorimotor stage of learning attended in the past 3 years (see Appendix K). Equal participants with master's degrees (n = 15) attended district or regional APE workshop focused on students at the sensorimotor stage of learning and attended a regional APE conference session focused on students at the sensorimotor stage of learning. Further, thirteen participants with master's degrees reported participation in observation of other APE service providers as personal professional development. Interestingly, of the 6 participants who held bachelor's degrees as their highest degree, the majority (n = 5) reported participating in formal or informal collaboration with other APE service providers focused on students at the sensorimotor stage of learning. Participants with the CAPE recognition attended district or regional workshops focused on students at the

sensorimotor stage of learning (n = 12) than attended regional APE conferences sessions focused on students at the sensorimotor stage of learning (n = 8). Participants with physical education and special education certifications participated in formal or informal collaboration with other APE service providers and observed other APE service providers. Participants with 1 to 3 years of APE Service Provision experience had attended more regional APE conference sessions focused on students at the sensorimotor stage of learning than other formats. Additionally, participants with 4 to 6 years of APE Service Provision experience had attended more district or regional APE workshops focused on students at the sensorimotor stage of learning than other formats. Participants with more than 10 years of APE Service Provision experience had participated in formal or informal collaboration with other APE service providers focused on students at the sensorimotor stage of learning than other formats.

Additional External Factors for Preparedness

The PSP pretest collected additional information about external factors related to being prepared to provide APE services for students with severe disabilities at the sensorimotor stage of learning. PSP pretest questions 29-32 and 34 collected data about having access to materials, programs, and various in-service programs related to students at the sensorimotor stage of learning (see Table 8). Additionally, PSP question 34 focused on participants' perspective about how limited professional knowledge makes providing services for students with severe disabilities at the sensorimotor stage of learning more difficult.

Equal participants (n = 8) responded with a neutral response (4) and moderately agreed to the statement regarding materials being available to help provide APE services for students at the sensorimotor stage of learning. As expected, the majority of participants' responses (76%) rated having access to materials and programs for students at the sensorimotor stage of learning makes

providing APE services for students at the sensorimotor stage of learning easier. Further, the majority of participants' responses (66%) rated having access to in-service programs for students at the sensorimotor stage of learning makes providing APE services for students at the sensorimotor stage of learning easier. Similarly, the majority of participant responses (n = 27) indicated agreement that having limited professional knowledge to provide APE services for students at the sensorimotor stage of learning makes providing services more difficult.

Table 8

Additional External Factors for Preparedness

Variable	Strongly Disagree (%)	Moderately Disagree (%)	Slightly Disagree (%)	Neutral Response (%)	Slightly Agree (%)	Moderately Agree (%)	Strongly Agree (%)
There are materials and programs available to help me provide APE services for students like Taylor and Alex.	1 (3%)	1 (3%)	2 (7%)	8 (28%)	3 (10%)	8 (28%)	6 (21%)
Having access to materials and programs available would make providing APE services for students like Taylor and Alex easier.	0 (0%)	0 (0%)	1 (3%)	3 (10%)	2 (7%)	1 (3%)	22 (76%)
There are limited in-service programs related to adapted physical education provided in my Region.	2 (7%)	4 (14%)	3 (10%)	6 (21%)	5 (17%)	5 (17%)	4 (14%)
Having access to various in-service programs related to adapted physical education would make providing APE services for students like Taylor and Alex easier.	0 (0%)	0 (0%)	1 (3%)	2 (7%)	2 (7%)	5 (17%)	19 (66%)
Having limited professional knowledge to provide APE services makes providing APE services for students like Taylor and Alex more difficult.	0 (0%)	0 (0%)	0 (0%)	2 (7%)	2 (7%)	7 (24%)	18 (62%)

Note. All data based on 29 responses

Posttest Demographic Information

A total of 10 participants completed the PSP posttest questionnaire. The participants' demographic information was completed in the PSP pretest questionnaire. The researcher used the random ID number for each participant to determine the demographic information of the participants who completed the PSP posttest questionnaire. Three participants (30%) completed a bachelor's degree, and the remaining 7 participants (70%) completed a master's degree. The majority of the participants (n = 8) held a certification in physical education. Further, 7 participants (70%) held a certification in special education and 2 participants (20%) held certifications in both physical education and special education. Finally, 4 participants had completed the requirements to be a Certified Adapted Physical Educator (CAPE).

Perceptions Toward Students at the Sensorimotor Stage of Learning

Initial Adapted Physical Education Service Provider Perceptions

Participants were asked to answer questions regarding their perceptions of students with severe disabilities at the sensorimotor stage of learning based on the 2 student profiles at the beginning of the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) pretest questionnaire (see Appendix A). PSP pretest question 34 was the primary question related to perceptions of students with severe disabilities at the sensorimotor stage of learning. PSP pretest questions 15 and 16 were used to gather data related to the relevance of providing APE services for students with severe disabilities at the sensorimotor stage of learning. Further, PSP pretest questions 41-44 gathered data related to experiences with provided APE services for students with disabilities at the sensorimotor stage of learning. Additionally, PSP pretest questions 45-48 gathered data related to participants' perceptions of physical education settings and services for students with disabilities at the

sensorimotor stage of learning. Finally, PSP pretest question 10 asked participants to disagree or agree with the statement, "For me to provide APE services for students like Taylor and Alex would be extremely difficult."

Participants were provided with 2 profiles of students at the sensorimotor stage of learning to determine if they had provided APE services for students with similar disabilities. The majority of participants (*n* = 25) reported providing APE services for students with severe disabilities at the sensorimotor stage of learning based on the 2 student profiles. Only 2 participants (7%) reported no experience providing services for students similar to the 2 student profiles. Slightly less than half of participants (n = 12) reported providing services for students very similar to the 2 student profiles. Eight participants (29%) reported providing APE services for students similar and 6 participants (21%) reported providing APE for students who were somewhat similar to the 2 student profiles.

Participants were asked to rate their disagreement or agreement to the statement, "Usually, people have a prejudice against students with disabilities, that students with disabilities like Taylor and Alex cannot learn and do well." Most of the participants (n = 24) responded in agreement with this statement. Further, the majority of participants (*n* = 10) responded with strong agreement with this statement. Only 1 participant indicated a neutral response and equal participants (n = 2) responded with moderate and slight disagreement. Additionally, participants were asked if providing APE services for students with severe disabilities at the sensorimotor stage of learning would provide better learning opportunities. Only 2 participants (7%) responded with a neutral response. The remainder of the participants (n = 27) responded in agreement with the statement. Five participants (17%) responded with slight agreement and 4 participants (14%) responded with moderate agreement. Over half of participants (n = 18)

strongly agreed that providing APE services provides better learning opportunities. Finally, participants were asked to disagree or agree with the statement that increasing learning opportunities for students with severe disabilities at the sensorimotor stage of learning would be valuable. Similarly, only 2 participants (7%) responded with a neutral response. One participant (3%) responded slightly agree and 3 participants (10%) responded moderately agree. The majority of participants (79%) responded with strong agreement with the statement.

The data gathered for PSP pretest questions 41-44 related to experiences with provided APE services for students with disabilities at the sensorimotor stage of learning (see Table 9).

Table 9

Adapted Physical Education Service Provision Perceptions

Variable	Number of Participants (%*)
Approximate number of students (*n* = 26)	
0 to 4 students	9 (36)
5 to 10 students	8 (32)
11 to 15 students	2 (8)
16 to 20 students	2 (8)
21 to 25 students	3 (12)
26 to 30 students	1 (4)
Level of Competence (*n* = 29)	
Not at all competent	1 (3)
Somewhat competent	10 (34)
Competent	14 (48)
Very competent	4 (14)
Setting for APE services	
General Physical Education (*n* = 28)	
Yes	8 (29)
Maybe	14 (50)
No	6 (21)
Physical Education in Separate Class (*n* = 29)	

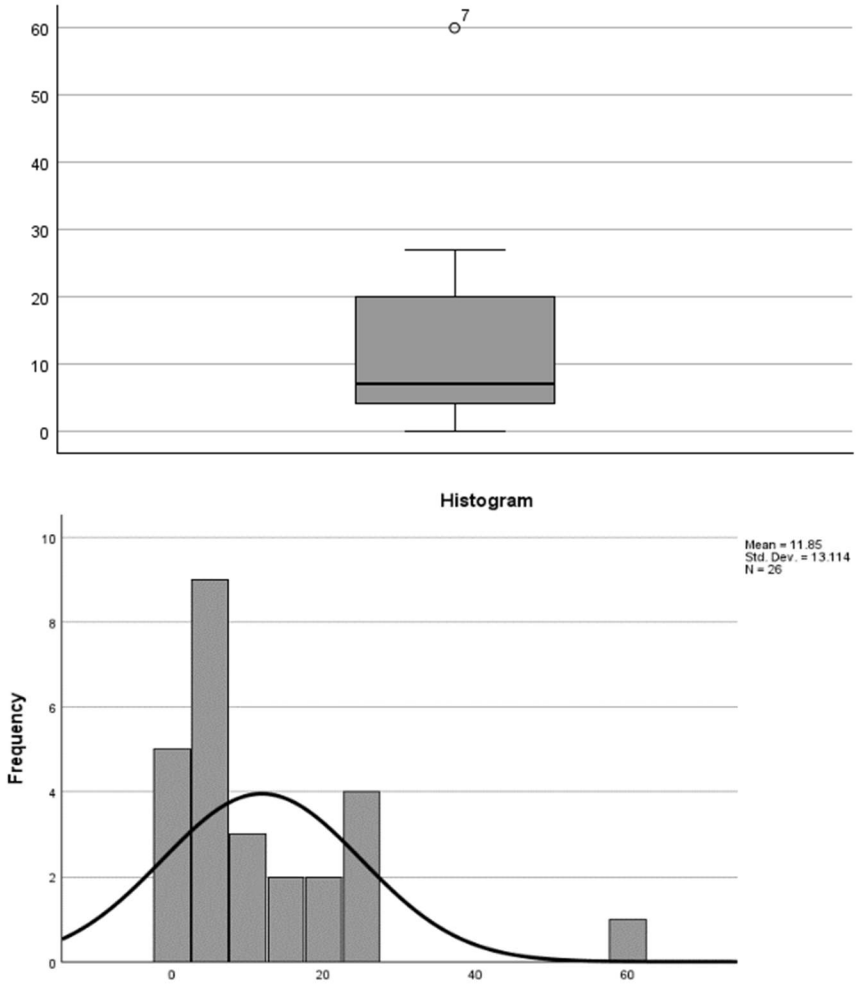
Yes	6 (21)
Maybe	18 (62)
No	5 (17)
Other (*n* = 16)	
Yes	12 (75)
Maybe	4 (25)
No	1 (6)
Ability to exclude from APE services (*n* = 29)	
Yes	8 (28)
No	21 (72)
Reasons for excluding students from APE services (*n* = 17)	
Safety concerns	11 (65)
No paraprofessional support	4 (24)
Lack of preparation	1 (6)
Assessment issues	5 (29)
Extra burden	1 (6)
No equipment	3 (18)
Lack of knowledge about APE	3 (18)
Inappropriate Physical Education programs for students with disabilities	10 (59)
Other	5 (29)
Total freedom of choice to provide APE services (*n* = 28)	
Yes	28 (100)
No	0 (0)

Note. * The number of respondents varied because of omitted responses.

First, to gain a better understanding of participants' experience with providing APE services for students with severe disabilities at the sensorimotor stage of learning, participants were asked to provide an approximate number of students from the past 3 years. The researcher used Tukey's boxplot and histogram to determine any outliers in the data (see Figure 13).

Figure 13

Boxplot and Histogram Identifying Outlier



A single response was identified as an outlier and skewed the data. As students with severe disabilities in general are considered a low incidence population, the data points were extreme compared to the other data points in the investigation. It was determined the outlier needed to be excluded from the data analysis. After the exclusion of the outlier responses, participant responses (*M* number of students = 9.92, *SD* = 8.87, range = 0 to 27) were 36% 0 to 5

students, 32% 6 to 10 students, 8% 11 to 15 students, 8% 16 to 20 students, 12% 21 to 25 students, and 4% 26 to 30 students.

Next, participants were asked to rate their experience with providing services for students at the sensorimotor stage of learning ($M = 5.07$, $SD = 1.16$) and to identify their perceived level of competence. The majority of the participants ($n = 18$) rated their experience positively (64%). Interestingly, no participant rated their experience as "extremely bad" and only 2 participants rated their experience below the neutral response (7%). Slightly fewer than half of the participants ($n = 14$) indicated feeling "competent" when providing APE services for students at the sensorimotor stage of learning (48%). Further, 10 participants indicated feeling "somewhat competent" (34%), and 4 participants indicated feeling "very competent" (14%). Only 1 participants indicated feeling "not at all competent" (4%).

Further, participants were asked to self-report their level of disagreement or agreement with the statement "Students with severe disabilities at the sensorimotor stage of learning are provided effective APE services at my school." Participants ratings ($M = 3.72$, $SD = 1.64$) were mostly negative ($n = 12$, 42%) with 4 participants (14%) indicating strong disagreement with the statement of effective services in their school. A total of 8 participants (28%) indicated a positive rating with only 2 participants (7%) indicating strong agreement with the statement of effective services in their school. The largest number of participant responses were neutral responses ($n = 9$, 31%).

Physical Education Settings and Exclusion of Services

Additional information collected with the PSP pretest questionnaire related to the settings for physical education and the option for APE service providers to exclude students with severe disabilities at the sensorimotor stage of learning. Half (50%) of the participants ($n = 14$)

responded that "maybe" students with severe disabilities at the sensorimotor stage of learning should participate in general education physical education settings. Slightly more participants (n = 8; 29%) responded that students at the sensorimotor stage of learning should participate in the general education physical education setting while 6 participants (21%) responded students at the sensorimotor stage of learning should not participate in the general education physical education setting. The majority of participants (n = 18; 62%) responded that "maybe" students at the sensorimotor stage of learning should participate in a separate physical education setting while 5 participants (17%) responded students at the sensorimotor stage of learning should not participate in a separate physical education setting. Six participants (21%) responded that students at the sensorimotor stage of learning should participate in a separate physical education setting.

When given the opportunity to describe other physical education settings, 5 participants (31%) identified Partner Physical Education/Unified Physical Education, 3 participants (19%) identified motor lab, 2 participants (13%) identified the special education classroom, 2 participants (13%) identified a combination of the general education physical education setting and the special education setting, 1 participant (6%) identified reverse mainstream with highly trained general education peers, 1 participant (6%) identified a smaller version of the general education physical education setting with general education peers, 1 participant (6%) identified homebound setting, and 1 participant (6%) indicated it depends on multiple factors.

When participants were asked if they could exclude students with severe disabilities at the sensorimotor stage of learning from APE services, the majority of participants (n = 21, 72%) reported no exclusion was allowed at their district or charter. Eight participants (28%) indicated students with severe disabilities at the sensorimotor stage of learning could be excluded from

APE services. Safety concerns (65%) were the highest rated reason for excluding students with severe disabilities at the sensorimotor stage of learning from APE services. Followed by reported inappropriate physical education programs for students with disabilities (59%).

Participants also indicated assessment issues (29%), lack of professional support (24%), lack of equipment (18%), lack of knowledge about APE services (18%), lack of preparation (6%), and perceived extra burden (6%) as reasons students with severe disabilities at the sensorimotor stage of learning could be excluded from APE services. When given the opportunity to describe other reasons for exclusion, participants indicated physical education medical exemptions, student behaviors, and lack of state requirements. When participants were asked if given total freedom to choose whether or not to provide APE services for students with severe disabilities at the sensorimotor stage of learning, all participants (n = 29, 100%) indicated the choice to provide APE services.

Finally, participants were asked to rate their disagreement or agreement to the statement, "For me to provide APE services to students like Taylor and Alex would be extremely difficult." The majority of participants (25%) slightly agreed with the statement followed by 6 participants (21%) who strongly agreed with the statement. Next, an equal number of participants (n = 4) responded with moderate disagreement, a neutral response, and slight agreement. Further, 2 participants responded with moderate agreement and only 1 participant responded with strongly agree.

RQ 2 Quantitative Results

The researcher used descriptive statistics and visual representations to analyze the data collected through the PSP pretest questions 34, 15, 16, 41-44, 45-48, and 10. Initially, the researcher planned to use the chi-square test of independence to examine relationships between

various variables. Fisher's exact test rather than the Chi-square test was used to further investigate relationships between variables and to determine significance of these relationships due to the small sample size. Spearman's correlation coefficient was also used to examine the correlation between categorical variables. Additionally, as described in Chapter 3, the researcher used descriptive statistics to determine whether the 3 assumptions were met to use a paired sample *t* test to analyze the data collected in PSP pretest and posttest questions. The pretest and posttest data for questions that met all assumptions were analyzed using a paired samples *t* test to determine whether there were significant differences. Next, the researcher conducted a Wilcoxon signed rank test to compare the remaining items. The practical significance was determined using Cohen's *d* (York, 2016). Statistical analysis was set at *p* values for all alpha less than .05. The researcher used the results of these analyses to answer the second research question.

Changes in Perceptions of Students at the Sensorimotor Stage of Learning

RQ 2. What are the self-reported changes in APE service providers' perceptions toward students at the sensorimotor stage of learning following an asynchronous professional development module focused on sensorimotor stage instructional strategies?

In order to develop a better understanding of the relationship between the participant's perceptions that providing APE services provides better opportunities for learning and increased learning opportunities would be valuable for students with severe disabilities at the sensorimotor stage of learning, the researcher performed a Spearman's correlation coefficient. First, the researcher used a scatter plot generated from the data to verify the assumption of monotonicity for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the participant's perceptions that providing APE services provides better opportunities for learning and increased learning opportunities would be valuable for

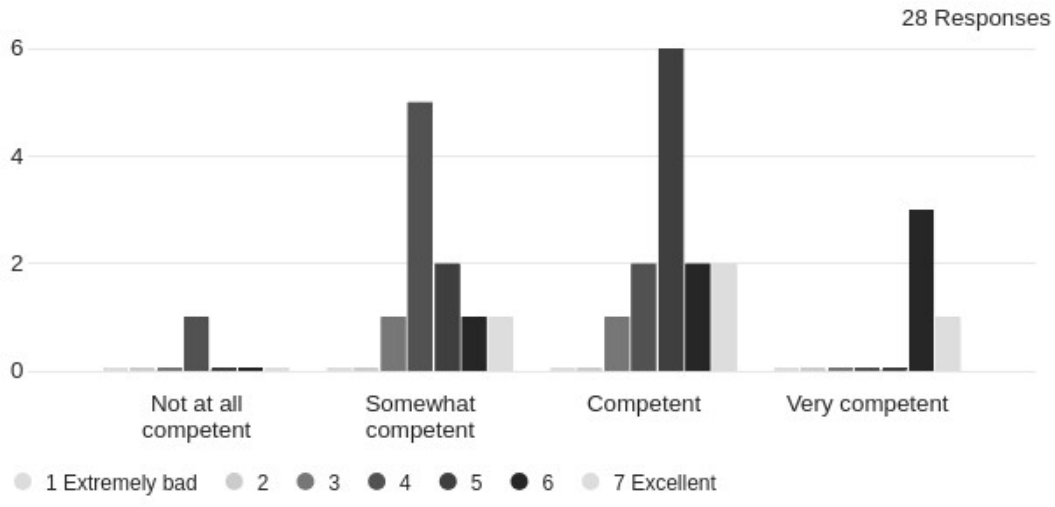
students with severe disabilities at the sensorimotor stage of learning were examined. The analysis reflected a positive and significant correlation between participants' perceptions of providing APE services provides better opportunities for learning and increasing opportunities to learn would be valuable, $r_s = .744$, $n = 29$, $p < .001$.

Experience and Competency

In order to gain better insight into the relationship between experiences with providing APE services for students at the sensorimotor stage of learning and competency (see Figure 14), the researcher used descriptive statistics and performed the Fisher's exact test. The visual representation indicates APE service providers with positive experiences rated their competency level higher than those who had negative experiences. Further, over twice as many APE service providers who rated their experiences with a neutral rating indicated feeling "somewhat competent" rather than "competent." The results of the Fisher's exact test ($p = .158$) did not indicate a significant association between the experience with students at the sensorimotor stage of learning and the level of competency.

Figure 14

Service Provision Experience Rating and Competency Level

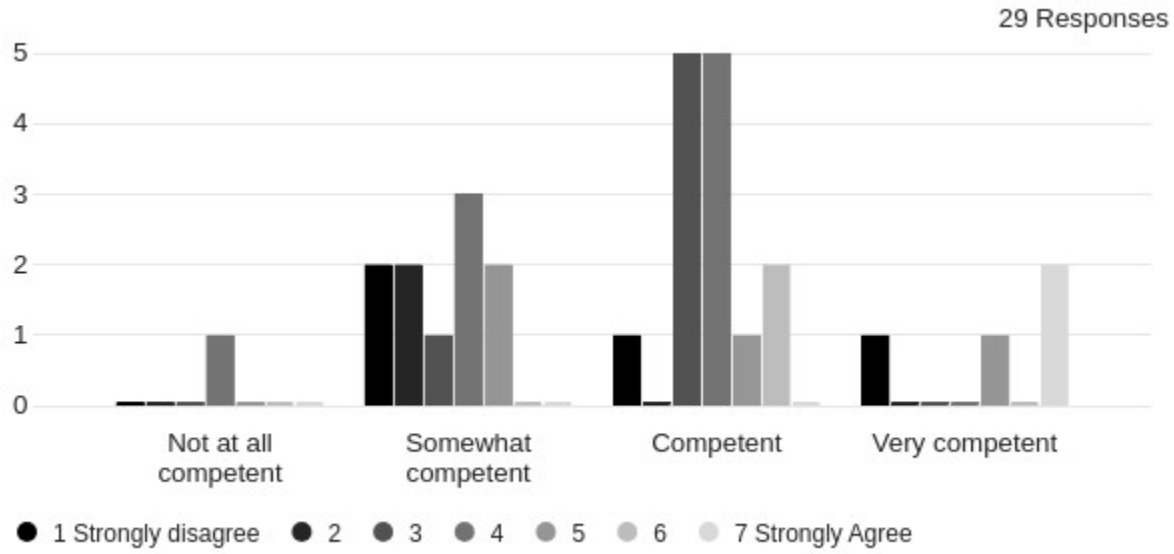


Competency and Self-Reported Effective Adapted Physical Education Service Provision

Next, to gain better understanding of the relationship between the level of competency and the self-reported rating of effective Service Provision the researcher used descriptive statistics and performed a Fisher's exact test. The visual representation (see Figure 15) indicates that participants who rated their level of competency as "very competent" also indicated strong agreement that students with severe disabilities at the sensorimotor stage of learning were provided effective services at their school. Interestingly, 1 participant who rated their level of competency as "very competent" indicated strong disagreement that students with severe disabilities at the sensorimotor stage of learning were provided effective services at their school. The results of the Fisher's exact test (p = .078) did not indicate a significant association between the level of competency and the self-reported rating of effective Service Provision for students at the sensorimotor stage of learning. However, it is worth noting that while the relationship was not significant relative to the standard alpha level of .05 the p value was less than .10 when examining this relationship. Additionally, Fisher's exact test give exact p-values however, the relevant literature reflects a view that the Fisher's exact test is more conservative and results in a lower null hypothesis rejection rate due to the conditions of the Fisher's exact test margins (Liddel, 1976).

Figure 15

Comparison of Competence Level and Effective APE Service Provision Rating



Further, to gain a better understanding of into the possible correlation between participants' experience ratings, competency level, and self-reported APE Service Provision effectiveness ratings for students at the sensorimotor stage of learning, the researcher performed a Spearman's correlation coefficient. First, the researcher used a scatter plot generated from the data to verify the assumption of monotonicity for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the participants' experience ratings, competency level, and self-reported APE Service Provision effectiveness ratings were examined. There were positive and significant correlations between participants' experiences ratings and participants' competency level, r_s = .493, n = 28, p .008 at the .01 alpha level and participants' experiences ratings and participants' self-reported APE Service Provision effectiveness ratings r_s = .431, n = 28, p .022 at the .05 alpha level.

Finally, the researcher conducted a Wilcoxon signed rank test to compare participants disagreement or agreement to the statement, "Usually, people have a prejudice against students with disabilities, that students with disabilities like Taylor and Alex cannot learn and do well," and their rating of disagreement or agreement with the statement about providing APE services for students with severe disabilities at the sensorimotor stage of learning being extremely difficult. Additionally, the researcher determined practical significance using Cohen's d. The Wilcoxon signed rank test for each item did not determine that there were significant differences between the responses of the 10 participants who completed the pretest and posttest. However, using Cohen's *d* the researcher determined practical significance indicated by a moderate effect size (r = .34) for participants disagreement or agreement to the statement, "Usually, people have a prejudice against students with disabilities, that students with disabilities like Taylor and Alex cannot learn and do well." Additionally, using Cohen's d the researcher determined practical significance indicated by a moderate effect size (r = .34) for participants rating of disagreement or agreement with the statement about providing APE services for students with severe disabilities at the sensorimotor stage of learning being extremely difficult.

Perceived Level of Confidence in APE Service Provision

The Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) pretest and posttest used 3 questions as the primary data to answer the third research question. PSP pretest questions 7-9 provided the participants with the opportunity to rate their perceived level of confidence in their ability to provide Adapted Physical Education services for students with severe disabilities at the sensorimotor stage of learning. Additionally, PSP pretest question 11 gather supporting data related to provision of

accommodations services for students with severe disabilities at the sensorimotor stage of learning.

Initial Perceived Confidence

Participants (n = 29) rated PSP pretest questions 7-9 and 11 responses related to perceived confidence when providing APE services for students with severe disabilities at the sensorimotor stage of learning are summarized in Table 10.

Table 10

Pretest Perceived Confidence of APE Service Providers

Statement	Mean	Median	SD
I am confident in my ability to provide APE services for students like Taylor and Alex.	5.34	5.00	1.21
I am confident in my ability to develop a Present Level of Academic Achievement and Functional Performance statement for students like Taylor and Alex.	5.00	5.00	1.31
I am confident in my ability to develop measurable annual goals and benchmark objectives for students like Taylor and Alex.	4.72	4.00	1.44
In general, I can provide accommodations for students like Taylor and Alex.	5.46	6.00	1.18

Note. (1 = Strongly disagree, 2 = Moderately disagree, 3 = Slightly disagree, 4 = Neutral, 5 = Slightly agree, 6 = Moderately agree, 7 = Strongly agree)

Most participants (n = 21, 73%) reported an initial positive level of confidence in their ability to provide APE services for students with severe disabilities at the sensorimotor stage of learning. Only 2 participants (7%) reported slight disagreement with the statement regarding their confidence in their ability to provide APE services for students at the sensorimotor stage of learning. Six participants (21%) indicated a neutral response. Slightly more participants (n = 14, 48%) responded in agreement to the statement about their ability to develop a Present Level of Academic Achievement and Functional Performance (PLAAFP) statement for students at the sensorimotor stage of learning than those who responded with a neutral response (n =13, 45%). Only 1 participant responded with a negative response indicating moderate disagreement to the

statement of PLAAFP development abilities. Further, slightly more participants (*n* = 13, 45%) responded in agreement to the statement about their ability to develop measurable annual goals and benchmark objectives for students at the sensorimotor stage of learning than those who responded with a neutral response (*n* =12, 41%). Four participants (14%) responded with negative responses indicating slight disagreement (n = 2, 7%) and moderate disagreement (n = 2, 7%) to the statement of annual goal and benchmark objectives development abilities. Finally, the majority of participants (n = 22, 76%) responded positively regarding the statement about their ability to provide accommodations for students at the sensorimotor stage of learning. Four participants (14%) responded with a neutral response to the statement and only two participants (7%) responded with slight disagreement to the statement.

RQ 3 Quantitative Results

In order to gain a better insight into participants level of perceived confidence with their abilities related to student with severe disabilities at the sensorimotor stage of learning, Spearman's correlation coefficient was used to examine the correlation between the PSP pretest variables related to confidence. As described in Chapter 3, the researcher used descriptive statistics to determine whether the 3 assumptions were met to use a paired sample t test to analyze the data collected in PSP pretest and posttest question 7-9 and 11. The researcher determined that all assumptions were met therefore, the pretest and posttest data for each question were analyzed using a paired samples *t* test to determine whether there were significant differences (JMP Statistical Discovery, 2023). The practical significance was determined using Cohen's *d* (York, 2016). Statistical analysis was set at *p* values for all alpha less than .05. The researcher used the results of these analyses to answer the third research question.

Confidence Correlations

RQ 3: What are the changes in APE service providers' self-reported level of confidence after participation in an asynchronous professional development learning module?

The researcher explored the possible correlation between participants' confidence in their abilities to provide Adapted Physical Education (APE) services (PSP question 7), their abilities to develop a Present Level of Academic Achievement and Functional Performance (PLAAFP) statement (PSP question 8), their abilities to develop measurable annual goals and benchmark objectives (PSP question 9), and their ability to provide accommodations for students at the sensorimotor stage of learning (PSP question 11) by performing a Spearman's correlation coefficient. First, the researcher used a scatter plot generated from the data to verify the assumptions for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the participants' confidence in their abilities to provide APE services, their abilities to develop a PLAAFP statement, their abilities to develop measurable annual goals and benchmark objectives, and their ability to provide accommodations for students at the sensorimotor stage of learning were examined. There were positive and significant correlations between all confidence variables (see Table 11).

Table 11

Spearman's Correlation Coefficients Between Confidence Variables

	Confidence in APE Service Provision	Confidence in PLAAFP Development	Confidence in Goals/Objectives Development	Provision of Accommodations
Confidence in APE Service Provision				
Confidence in PLAAFP Development	0.631**			
Confidence in Goals/Objectives Development	0.624**	0.787**		
Provision of Accommodations	0.601**	0.455*	0.560**	

Note. ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Posttest Perceived Confidence

Participants who completed the intervention PD module (n = 10) provided responses to PSP posttest questions 7-9 and 11 related to perceived confidence when providing APE services for students with severe disabilities at the sensorimotor stage of learning are in Table 12. Provided in Table 12 is a summary of participants' agreement or disagreement to each statement of confidence.

Table 12

Posttest Perceived Confidence of APE Service Providers

Statement	Mean	Median	SD
I am confident in my ability to provide APE services for students like Taylor and Alex.	5.70	6.00	0.90
I am confident in my ability to develop a Present Level of Academic Achievement and Functional Performance statement for students like Taylor and Alex.	5.90	6.00	0.70
I am confident in my ability to develop measurable annual goals and benchmark objectives for students like Taylor and Alex.	5.50	6.00	1.02
In general, I can provide accommodations for students like Taylor and Alex.	5.6	6.00	1.02

Comparison of Perceived Confidence Before and After Intervention

A paired samples *t* test was conducted to compare the perceived level of confidence in participants' abilities to provide APE services for students with severe disabilities at the sensorimotor stage of learning before and after participation in the self-paced asynchronous professional development module which was the *Sensorimotor Guided Practice Workbook* developed by the researcher. A Shapiro-Wilk test indicated the differences between the conditions were normally distributed (W = .899[10], p = .212). The paired samples *t* test indicated that participants perceived confidence in their abilities to provide APE services for students with severe disabilities at the sensorimotor stage of learning after participation in the *Sensorimotor Guided Practice Workbook* PD module (M = 5.7, SD = .95) was not significantly higher compared to before the PD module (M = 5.5, SD = 1.18), $t(9) = -.514$, $p = .619$. Using Cohen's *d* to determine practical significance, the researcher determined a small effect size, $r = .16$.

Next, a paired samples *t* test was conducted to compare the perceived level of confidence in participants' abilities to develop a PLAAFP statement for students with severe disabilities at the sensorimotor stage of learning before and after participation in the self-paced asynchronous professional development module which was the *Sensorimotor Guided Practice Workbook* developed by the researcher. A Shapiro-Wilk test indicated the differences between the conditions were normally distributed (W = .907(10), p = .258). The paired samples *t* test indicated that participants perceived confidence in their abilities to develop a PLAAFP statement for students with severe disabilities at the sensorimotor stage of learning after participation in the *Sensorimotor Guided Practice Workbook* PD module was not significantly higher (M = 5.9, SD = .74) compared to before the PD module (M = 5.4, SD = 1.17), $t(9) = -1.46$, $p = .177$. Using

Cohen's d to determine practical significance, the researcher determined a moderate effect size, $r = .46$.

Further, a paired samples *t* test was conducted to compare the perceived level of confidence in participants' abilities to develop measurable annual goals and benchmark objectives for students with severe disabilities at the sensorimotor stage of learning before and after participation in the *Sensorimotor Guided Practice Workbook* developed by the researcher. A Shapiro-Wilk test indicated the differences between the conditions were normally distributed (W = .919[10], p = .346). Based on the paired samples *t* test, the participants' perceived confidence in their abilities to develop measurable annual goals and benchmark objectives for students with severe disabilities at the sensorimotor stage of learning after participation in the *Sensorimotor Guided Practice Workbook* PD module were not significantly higher ($M = 5.5$, $SD = 1.08$) compared to before the PD module ($M = 5.0$, $SD = 1.41$), $t(9) = -.958$, $p = .363$. Using Cohen's d to determine practical significance, the researcher determined a moderate effect size, $r = .30$.

Finally, a paired samples *t* test were conducted to compare the perceived level of confidence in participants' abilities to provide accommodations for students with severe disabilities at the sensorimotor stage of learning before and after participation in the *Sensorimotor Guided Practice Workbook* developed by the researcher. A Shapiro-Wilk test indicated the differences between the conditions were normally distributed (W = .930[9], p = .486). The paired samples *t* test indicated that participants perceived confidence in their abilities to provide accommodations for students with severe disabilities at the sensorimotor stage of learning after participation in the *Sensorimotor Guided Practice Workbook* PD module were not significantly higher ($M = 5.7$, $SD = 1.22$) compared to before the PD module ($M = 5.2$,

SD = 1.09), $t(9) = -.936$, $p = .377$. Using Cohen's d to determine practical significance, the researcher determined a moderate effect size, $r = .31$.

Changes in Highly Effective Instructional Strategy Implementation

The Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) pretest and posttest question 50 was the primary data used to answer the fourth research question. This PSP pretest and posttest question provided the participants with the opportunity to rate the use of research-based strategies, evidence based strategies, accommodations, and modifications for students with severe disabilities at the sensorimotor stage of learning. The researcher did not provide any distinction between the strategies to identify if the strategies were considered research-based strategies, evidence-based practices, accommodations, or modifications. Participants were asked to rate their use by indicating if each research based strategy, evidence based practice, accommodation, or modification was used "always" to "not at all."

Initial Reported Use of Strategies, Practices, Accommodations, and Modifications

PSP pretest question 50 responses related to the use of research-based strategies, evidence-based practices, accommodations, and modifications when providing APE services for students with severe disabilities at the sensorimotor stage of learning (see Table 13).

Table 13

Pretest Frequency of Strategies, Practices, Accommodations, and Modifications Used

Strategies, Accommodations, and Modifications	Not at All (%)*	Rarely (%)*	Occasionally (%)*	Neutral Response (%)*	Sometimes (%)*	Often (%)*	Always (%)*
Repeat directions	1 (4%)	0 (0%)	0 (0%)	1 (4%)	1 (4%)	2 (7%)	23 (82%)
Assign a peer tutor	3 (11%)	2 (7%)	3 (11%)	6 (21%)	6 (21%)	2 (7%)	6 (21%)
Change rules of the game	1 (4%)	0 (0%)	0 (0%)	1 (4%)	1 (4%)	6 (21%)	19 (68%)
Adapting for safety	1 (4%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	1 (4%)	25 (89%)
Provide adapted equipment	1 (4%)	0 (0%)	0 (0%)	4 (14%)	1 (4%)	6 (21%)	16 (57%)
Provide extra skill instruction	1 (4%)	0 (0%)	0 (0%)	1 (4%)	4 (14%)	7 (25%)	15 (54%)
Modify fitness testing	1 (4%)	0 (0%)	0 (0%)	2 (7%)	2 (7%)	1 (4%)	21 (78%)
Give special reinforcement	1 (4%)	0 (0%)	0 (0%)	4 (14%)	4 (14%)	6 (21%)	13 (46%)
Implement a routine	1 (4%)	0 (0%)	1 (4%)	3 (11%)	3 (11%)	3 (11%)	16 (59%)
Provide least to most prompting	3 (11%)	3 (11%)	4 (15%)	4 (15%)	4 (15%)	3 (11%)	6 (22%)
Provide most to least prompting	2 (7%)	1 (4%)	1 (4%)	4 (15%)	2 (7%)	11 (41%0	6 (22%)
Provide hand over hand guidance	1 (4%)	1 (4%)	1 (4%)	5 (19%)	7 (26%)	6 (22%)	6 (22%)
Provide hand under hand guidance	1 (4%)	1 (4%)	1 (4%)	3 (11%)	7 (25%)	10 (36%)	5 (18%)
Provide tactual modeling	1 (4%)	0 (0%)	0 (0%)	5 (18%)	4 (14%)	8 (29%)	10 (36%)
Provide visual modeling	1 (4%)	0 (0%)	0 (0%)	2 (7%)	2 (7%)	5 (18%)	18 (64%)
Provide one-on-one instruction	1 (4%)	0 (0%)	0 (0%)	3 (11%)	3 (11%)	9 (32%)	12 (43%)

Note. * The number of respondents varied because of omitted responses.

The participants most frequently used research-based strategies, evidence-based practices, accommodations, and modifications for students with severe disabilities at the sensorimotor stage of learning were adapting for safety (89%), repeating directions (82%), modifying fitness testing (78%), changing the rules of the game (68%), and providing visual modeling (64%). Further, participants most often used research-based strategies, evidence-based practices, accommodations, and modifications for students with severe

disabilities at the sensorimotor stage of learning were providing most to least prompting (41%), providing one-on-one instruction (32%), and providing tactual modeling (29%). An equal number of participants (n = 7) indicated sometimes using hand over hand guidance and hand under hand guidance. Interestingly, participants' highest negative rating responses indicated assigning a peer tutor (29%) and providing least to most prompting (37%) as least often used by participants.

It is worth noting that slightly over half of the participants (59%) indicated using the research-based strategy recommended in Chapter 2. Additionally, Chapter 2 also emphasized the importance of hand under hand guidance which was indicated as most frequently used by only 5 participants (18%) rather than the passive skill participation demonstrated with hand over hand guidance indicated by 6 participants (22%). Further, only 6 participants indicated use of least to most prompting (22%) as one of the most frequently used instructional strategies. These instructional strategies were also emphasized in the *Sensorimotor Guided Practice Workbook* which was the professional development module intervention in this investigation.

In order to develop a better understanding of the relationship between the number of undergraduate courses taken, the number of professional development opportunities attended, and the use of the 3 instructional strategies for students with severe disabilities at the sensorimotor stage of learning supported by the relevant literature, the researcher performed a Spearman's correlation coefficient. First, the researcher used a scatter plot generated from the data to verify the assumption of monotonicity for the Spearman's correlation coefficient were met. After verification that the assumptions were met, the relationship between the participants' number of undergraduate courses taken, the number of professional development opportunities attended, and the use of the three instructional strategies for students with severe disabilities at

the sensorimotor stage of learning supported by the relevant literature were examined. The analysis reflected only one positive and significant correlation between implementing the routines strategy and using hand under hand guidance, $r_s = .617$, $n = 27$, $p < .001$.

Posttest Reported Use of Strategies, Practices, Accommodations, and Modifications

PSP posttest question 50 responses related to the use of instructional strategies, accommodations, and modifications when providing APE services. Provided in Table 14 are the frequencies and percentages for the 10 participants who completed the *Sensorimotor Guided Practice Workbook* and responded to the posttest PSP questionnaire.

Table 14

Posttest Frequency of Strategies, Practices, Accommodations, and Modifications Used

Strategies, Accommodations, and Modifications	Not at All (%)	Rarely (%)	Occasionally (%)	Neutral Response (%)	Sometimes (%)	Often (%)	Always (%)
Repeat directions	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (20%)	1 (10%)	7 (70%)
Assign a peer tutor	0 (0%)	1 (10%)	2 (20%)	3 (30%)	1 (10%)	1 (10%)	2 (20%)
Change rules of the game	0 (0%)	0 (0%)	0 (0%)	1 (10%)	0 (0%)	2 (20%)	7 (70%)
Adapting for safety	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10 (100%)
Provide adapted equipment	0 (0%)	0 (0%)	0 (0%)	1 (10%)	1 (10%)	3 (30%)	5 (50%)
Provide extra skill instruction	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (30%)	7 (70%)
Modify fitness testing	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (10%)	1 (10%)	8 (80%)
Give special reinforcement	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (10%)	4 (40%)	5 (50%)
Implement a routine	0 (0%)	0 (0%)	0 (0%)	2 (20%)	3 (30%)	2 (20%)	3 (30%)
Provide least to most prompting	0 (0%)	2 (20%)	1 (10%)	4 (40%)	0 (0%)	1 (10%)	2 (20%)
Provide most to least prompting	0 (0%)	2 (20%)	0 (0%)	2 (20%)	0 (0%)	1 (10%)	5 (50%)
Provide hand over hand guidance	0 (0%)	1 (10%)	1 (10%)	2 (20%)	3 (30%)	1 (10%)	2 (20%)
Provide hand under hand guidance	0 (0%)	1 (10%)	2 (20%)	1 (10%)	1 (10%)	2 (20%)	3 (30%)
Provide tactual modeling	0 (0%)	0 (0%)	2 (20%)	0 (0%)	1 (10%)	4 (40%)	3 (30%)
Provide visual modeling	0 (0%)	0 (0%)	1 (10%)	0 (0%)	1 (10%)	2 (20%)	6 (60%)

*Provide one-on-one instruction	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (50%)	4 (40%)

* The number of respondents varied because of omitted responses.

RQ 4 Quantitative Analysis

As described in Chapter 3, the researcher used descriptive statistics to determine whether the three assumptions were met to use a paired sample t test to analyze the data collected in PSP pretest and posttest question 50.

RQ 4: How will APE service providers self-reported implementation of highly effective instructional strategies change after completing an asynchronous professional development learning module?

The researcher determined five items that met all three assumptions: (a) assign a peer tutor, (b) provide adapted equipment, (c) implement a routine, (d) provide least to most prompting, and (e) provide hand under hand guidance. The paired t test for each item did not determine that there were significant differences between the responses of the 10 participants who completed the pretest and posttest (see Table 14). However, using Cohen's *d* the researcher determined practical significance indicated by a small effect size after participation in the *Sensorimotor Guided Practice Workbook* professional development module for assigning a peer tutor and providing hand under hand guidance (see Table 15). Further, the researcher determined a moderate effect indicated for the research-based strategy of implementing a routine (see Table 15).

Table 15

T test and Cohen's d Results

	Pretest *M*	Pretest *SD*	Posttest *M*	Posttest *SD*	*t*	*df*	*p*	Cohen's *d*
Assign a peer tutor	5.00	1.93	4.67	1.73	0.50	8	0.631	0.17
Provide adapted equipment	6.11	1.05	6.11	1.05	0.00	8	1.00	0.00
Implement a routine	6.22	1.39	5.56	1.24	1.15	8	0.282	0.39
Provide least to most prompting	4.50	2.45	4.36	1.77	0.10	7	0.920	0.04
Provide hand under hand guidance	5.78	0.67	5.34	1.66	0.839	8	0.426	0.28

Next, the researcher conducted a Wilcoxon signed rank test to compare the remaining items: (a) repeat directions, (b) change rules of the game, (c) adapt for safety, (d) provide extra skill instruction, (e) modify fitness testing, (f) give special reinforcement, (g) provide most to least prompting, (h) provide hand over hand guidance, (i) provide tactual modeling, (j) provide visual modeling, and (k) provide one-on-one instruction. Additionally, the researcher determined practical significance using Cohen's d. The data analyses results are provided in Table 16. The Wilcoxon signed rank test for each item did not determine that there were significant differences between the responses of the 10 participants who completed the pretest and posttest. However, using Cohen's *d* the researcher determined practical significance indicated by a small effect size after participation in the *Sensorimotor Guided Practice Workbook* professional development module for changing the rules of the game, providing hand over hand guidance, providing tactual modeling, and providing visual modeling (see Table 15). Further, the researcher determined a moderate effect indicated for repeating direction, providing extra skill instruction, and providing one-on-one instruction.

Table 16

Wilcoxon signed rank test and Cohen's d Results

	Pretest *Md*	*n*	Posttest *Md*	*n*	*z*	*p*	Cohen's *d*
Repeat directions	7.00	9	7.00	10	-1.342	0.180	0.31
Change rules of the game	7.00	9	7.00	10	-0.477	0.655	0.10
Adapting for safety	7.00	9	7.00	10	0.000	1.000	0.000
Provide extra skill instruction	7.00	9	7.00	10	-1.342	0.180	0.31
Modify fitness testing	7.00	8	7.00	10	0.000	1.000	0.000
Give special reinforcement	6.00	9	6.50	10	-0.577	0.564	0.13
Provide most to least prompting	6.00	8	6.50	10	-0.382	0.705	0.09
Provide hand over hand guidance	5.00	8	5.00	10	-0.447	0.655	0.11
Provide tactual modeling	6.00	9	6.00	10	-0.962	0.336	0.22
Provide visual modeling	6.00	9	7.00	10	-0.108	0.914	0.25
*Provide one-on-one instruction	6.00	9	6.00	9	-1.342	0.180	0.31

Intervention Implementation Monitoring

Each section of the *Sensorimotor Guided Practice Workbook* ended with a three question multiple choice quiz about the information provided in the section (Appendix H). The quizzes served the purposes of monitoring completion and understanding. Participants were provided with the correct answers to the questions after completing each quiz. Fifteen participants completed Section 2: What is a Sensorimotor Stage Learner? Quiz with 80% of participants (n = 12) correctly answering the first question, 100% of participants (n = 15) correctly answering the second question, and 93% of participants (n = 14) correctly answering the third question. The Section 3: How do we create a PLAAFP statement? Quiz was completed by 15 participants. The first and second question was correctly answered by 93% of participants (n = 14) and the third question was correctly answered by all participants (n = 15, 100%). Twelve participants completed the Section 4: How do we TEACH our Sensorimotor Stage Learners? Quiz with 100% of participants (n = 12) correctly answering the first question, 92% of participants (n = 11)

correctly answering the second question, and 100% of participants (n = 12) correctly answering the third question. The Section 5: How do we write GOALS for our Sensorimotor Stage Learners? Quiz was completed by 13 participants with 100% of participants (n = 13) correctly answering the first question, 100% of participants (n = 13) correctly answering the second question, and 92% of participants (n = 12) correctly answering the third question.

Participant Interviews

The researcher used the feature of the online platform (Qualtrics) to randomly select participants in a follow-up interview. As only 10 participants completed the investigation process (i.e., consent, pretest questionnaire, professional development module, posttest questionnaire), only 4 participants were randomly selected and offered a time slot for the follow-up phone interview. Out of the 4 randomly selected interview participants, only 1 participant called the provided number to complete the interview. The researcher provided all the remaining participants with the option to complete a phone interview on a given day. The researcher provided 5 times throughout the day which were before the workday began, around lunch time, at the end of the workday, the evening, and at night. Participants were provided with the initial Google voice number to call in order to maintain anonymity. Additionally, participants were provided with the opportunity to complete the interview questions in written form through a Google form.

The purpose of the interview was to gather supplemental descriptive information related to the instructional strategies used before and after the intervention. Participants were also asked about how their level of confidence and perceptions of students with severe disabilities at the sensorimotor stage of learning had changed after the intervention. Finally, participants were

asked to share their thoughts about the asynchronous self-paced professional development module in general.

During the phone interview, the researcher followed the interview protocol (see Appendix I) as it was written and provided sufficient time for participant responses (Christensen et al., 2015). The researcher took notes during the interview and provided the participant with a copy of the notes through a text to check for accuracy. Participant, APE 1, seemed enthusiastic and happy to share information with the researcher. Further, 2 participants, APE 2 and APE 3, provided information through the written interview option. Table 17 provides the participants' answers to the interview questions.

The first interview question was developed to gain more insight into the instructional strategies typically used daily by APE service providers with students with severe disabilities at the sensorimotor stage of learning. APE 1 and APE 2 explicitly reported using two of the three highly effective instructional strategies for students at the sensorimotor stage of learning. These strategies were using hand under hand guidance and establishing routines. APE 2 noted establishing generic routines. APE 1 and APE 3 both reported using the Premack method. Further, APE 3 reported allowing multiple representations of task initiation. Followed by a question asking participants to share any changes in their perceptions of students with severe disabilities at the sensorimotor stage of learning. APE 3 shared a change in ". . . awareness building for implementation of APE purposes."

Further, a question was developed to gather more information regarding changes in strategy implementation that occurred after completing the *Sensorimotor Guided Practice Workbook* professional module. APE 1 referred to a model in the *Sensorimotor Guided Practice*

Workbook and reflected more intentional use of hand under hand guidance. APE 3 shared the use of identifying the arousal state of a student and using strategies to increase attention.

Interviewees were asked to describe their level of confidence after participation in the *Sensorimotor Guided Practice Workbook* professional development module in the third question. APE 1 and APE 2 explicitly stated their confidence level had increased. The next question asked interviewees to share any changes in their perceptions of students with severe disabilities at the sensorimotor stage of learning. APE 3 shared a change in ". . . awareness building for implementation of APE purposes." When asked directly to share thoughts and comments about the professional development module, the interviewees all shared positive statements.

Table 17

Interview Questions and Answers

	APE 1 Phone Interview	APE 2 Written Interview	APE 3 Written Interview
What strategies do you typically use when working with students with severe disabilities at the sensorimotor stage of learning?	Provide hand over hand guidance, Provide hand under hand guidance, Provide visual modeling, video modeling, verbal prompting, redirection, first/then statements	I try to establish routines although they are typically to generic.	Observational and assessment data as the baseline, I typically provide multiple means of engagement centered around that student's preferences and propensity towards while using the Premack method. Observe students' response to the stimulus allowing multipolar ways of representing task initiation, and continue this for every visit monitoring action and expression.
What instructional strategy changes when working with students with severe disabilities at the sensorimotor stage of learning have you made after participating in the professional development module?	The PD reminded me to be more intentional with strategies such as hand under hand modeling. There was a good model of hand under hand modeling in the PD videos.	None yet. I haven't seen any of those students yet.	I piloted this approach with one student. We were making progress with his grasping and increasing attention span while in alert arousal stage.
How has your level of confidence about working with students with severe disabilities at the sensorimotor stage of learning changed after participating in the professional development learning opportunity?	Increased confidence in my ability to provide APE services. Many of the strategies in the PD were things I know. The PD was a good reminder to do the strategies more often and the new strategies were things I want to try.	My confidence has greatly increased, but I've realized I need to do much more prep work.	I appreciated this module and conceptual process and in the work I do, including what I feel that may overlap with related services. I am considering how they used a variety of real world applications (self care) and how this can have effective transfer for some of my students. I may want to start with brushing hair, using a mirror, and all that sensory input to achieve a better understanding of who my students are. Initiate something not common in PE TEKS.

How have your perceptions of students with severe disabilities at the sensorimotor stage of learning changed after participation in the study?	I've always been attracted to working with these students. I've always thought these students can learn and I can be a better model for other professionals as a way to encourage others to get these students more involved. Some of our current staff members seem stuck in their ways and I feel this information can be shared to open their eyes.	It hasn't changed	It has improved in the way of making more connections with OT/PT in the future. We don't actually collaborate in my district. In fact I am somewhat frustrated with their level of commitment in providing effective support. Awareness building for implementation for APE purposes.
What thoughts or comments would you like to share about the professional development learning opportunity?	The PD was well done. Great reminders of known information or new things to try. The timeframe for the PD was perfect. It wasn't too long or too short. A new person to APE could get a lot out of this PD in a short amount of time and get more "bang for their buck." The sections about developing a PLAAFP statement and writing goals and objectives were easy to understand. This PD could be relevant for other instructional providers.	It was a lot of really good information and something that I'm going to use as a reference moving forward.	It was useful and effective in allowing me the opportunity to use the guidelines with a new student on my caseload and to share this with the PE teacher. I believe that this could have a bigger impact in broader share in our APE community.
Do you have any additional questions or comments you would like to share?		It was a lot of really good information and something that I'm going to use as a reference moving forward.	Is there a plan to possibly include this in the creation of an APE assessment?

Examination Reliability and Validity

Jeong (2008), who developed the Physical Education Teachers' Beliefs and Intentions Toward Teaching Students with Disabilities (TBITSD), examined the reliability and validity of the questionnaire based on the recommendations of Ajzen (2001). The current investigation's Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) was a modified version of the TBITSD. Therefore, the researcher determined reliability of the PSP using Cronbach's alpha test to measure the internal consistency of the test items (Gay et al., 2006). It is worth noting that the research design included a pretest and posttest administration of the PSP. However, due to the limited number of responses on the posttest the researcher determined using Cronbach's alpha would be the most appropriate measurement for internal consistency. A coefficient alpha of greater than or equal to .70 is generally acceptable for research purposes (Johnson & Christensen, 2014, p. 170).

Jeong (2008) established reliability with the direct measures (i.e., attitude, subjective norms, and perceived behavioral control), indirect measures (i.e., behavioral beliefs, normative beliefs, control beliefs), and intentions. Construct validity for the PSP was examined by performing an exploratory factor analysis (EFA) rather than the confirmatory factor analysis test used by Jeong (2008). This type of analysis was used due to the small sample size and to analyze the modifications made (i.e., minimal changes in wording, changes in location of some questions, addition of questions, transition to consistent anchors, reduction of redundant questions). Further, the researcher decided to adhere to Ajzen's (2001) theoretical recommendation that internal consistency is required on the direct measure of attitude, subjective norm, and perceived behavioral control. This decision was based on the literature that identifies the direct measure of attitude, subjective norm, and perceived behavioral control that influence

intentions to perform a certain behavior. Further, Heuckmann et al. (2019) indicated that interventions are developed to make changes in the direct measures (e.g. attitude, subjective norm, perceived behavioral control) with the expectation that intentions and behaviors are changed (Heuckmann et al., 2019). Additionally, construct validity was examined for intentions by performing an EFA.

Direct Measures – Attitudes, Subjective Norm, and Perceived Behavioral Control

In the original TBITSD, Jeong did not explicitly distinguish test items into the categories of attitude, subjective norm, or perceived behavioral control. Instead, all 9 direct measures formed the first section of questions. The researcher divided the first 12 questions of the PSP into 3 categories of questions which were attitude, subjective, norm and perceived behavioral control (see Appendix A). The first 3 questions related to attitude were the similar to the original TBITSD questions with only minor adjustments to reflect APE service providers rather than physical education teachers regarding attitude. The next 3 PSP questions were like the original TBITSD questions regarding subjective norm with only minor adjustments to reflect APE service providers rather than physical education teachers. The final 6 PSP questions regarding perceived behavioral control were a mix of questions comparable to the original TBITSD questions with the addition of 2 questions regarding perceived confidence. Additionally, a question from the original TBITSD regarding providing accommodations was included in this section rather than in the control beliefs category of questions.

Before performing the exploratory factor analysis, the researcher used descriptive statistics in SPSS to verify that the sample size was adequate by using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. First, the researcher performed the KMO test on the direct measures (i.e., attitude, subjective norms, and perceived behavioral

control). The KMO (.72) was greater than .50 indicating the data were suited for factor analysis (Dziuban & Shirkey, 1974). Additionally, the Barlett's test of sphericity demonstrates significance (<.001).

In the process of performing the KMO test for the direct measures, the scree plot indicated one factor. The researcher performed another exploratory factor analysis based on eigenvalue greater than 1 which indicated 4 factors. Following the process of Jeong (2008) the researcher performed a final exploratory factor analysis for 3 factors. The exploratory factor analysis with principal axis factoring method and varimax rotation was performed on the 12 direct measure items for the sample of 29 Adapted Physical Education (APE) service providers. The three factors were extracted and combined to explain 68.82% of the variance of items (see Table 18). Factor loadings ranged from .43 to 91. Similarly to the finding by Jeong (2008), this indicated that the items were effective indicators of the constructs. Cronbach's alphas indicated that internal consistency was acceptable for each factor (see Table 18) as well as for the overall scale ($\alpha = .85$).

The first factor (eigenvalue = 5.20) referring to perceived behavioral control accounted for 23.18% of the total variance. Communality estimates were .42 to .84. The original TBITSD question 7 regarding confidence with only minor adjustments to reflect APE service providers rather than physical education teachers (PSP Q7), the additional questions regarding confidence developed for the PSP (PSP Q8 and Q9), and the question regarding providing accommodations (PSP Q11) which was relocated from an indirect beliefs measure all loaded with perceived behavior control. Reliability of perceived behavior control was .85 using Cronbach's alpha tests. The second factor (eigenvalue = 1.84) referring to attitude accounted for 15.34% of the total

variance. Communality estimates were .72 to .85. Cronbach's alpha tests indicated that the interval consistency of attitude was acceptable (.91).

Table 18

Eigenvalues, Factor Loadings, and Cronbach's Alpha Coefficients for Direct Measures

Factor and Direct Measure Items	Cronbach's alpha	ATT	SN	PBC
Factor 1. Perceived Behavioral Control	0.85			
PSP Q9. I am confident in my ability to develop measurable annual goals and objectives for students like Taylor and Alex.				**0.91**
PSP Q8. I am confident in my ability to develop a PLAAFP statement for students like Taylor and Alex.				**0.87**
PSP Q7. I am confident in abilities to provide APE services for students like Taylor and Alex.			0.52	**0.65**
PSP Q11. In general, I can provide accommodations for students like Taylor and Alex.				**0.43**
Factor 2. Attitude	0.91			
Providing APE services for students like Taylor and Alex would be:				
PSP Q3. Extremely worthless - Extremely useful		**0.89**		
PSP Q2. Extremely bad - Extremely good		**0.89**		
PSP Q1. Extremely harmful - Extremely beneficial		**0.66**	0.44	
Factor 3. Subjective Norm	0.74			
PSP Q12. Whether I provide APE services effectively for students like Taylor and Alex or not is mostly up to me.			**0.75**	
PSP Q10. For me to provide APE services to students like Taylor and Alex would be extremely difficult.			**0.56**	
PSP Q6. I feel under social pressure to provide APE services to students like Taylor and Alex.			**0.53**	
PSP Q4. Most people who are important to me think I should include students like Taylor and Alex on my caseload.			**0.50**	
No Factor Load				
PSP Q5. It is expected of me that I provide APE services to students like Taylor and Alex.				
Internal Consistency of All Direct Measure Items	0.85			
Percentage of Variance Explained		15.34%	10.16%	43.30%
Total Variance Explained = 68.82%				
Eigenvalues		1.84	1.22	5.20

Note. ATT = Attitude, SN = Subjective Norm, PCB = Perceived Behavioral Control

The third factor (eigenvalue = 1.22) referring to subjective norm accounted for 10.16% of the total variance. Communality estimates were .16 to .60. In Jeong's original analysis, TBITSD question 4, "Most people who are important to me that I should not/should teach students like Jiho in my physical education class," loaded more with perceived behavioral control than subjective norm. Jeong reported that the question had loaded with subjective norm as well and made the determination that the question would remain with subjective norm because the question had been developed for subjective norm. In the present investigation, the exploratory factor analysis resulted in the PSP Q4, "Most people who are important to me think that I should include students like Taylor and Alex on my caseload," loaded with subjective norm (.40) only. The next question developed by Jeong for the TBITSD with only minor adjustments to reflect APE service providers rather than physical education teachers regarding the expectation of providing APE services for students like Taylor and Alex (PSP Q5) did not load with any of the 3 factors. The final subjective norm question (PSP Q6) regarding social pressure to provide services loaded with the third factor. Additionally, the 2 questions (PSP 10 and 12) that were similar to the original TBITSD questions with only minor adjustments to reflect APE service providers rather than physical education teachers that were developed to load with perceived behavior control loaded with subjective norm. Reliability of perceived behavior control was .74 using Cronbach's alpha tests.

Intention

Jeong used 4 items related to assess intention in the TBITSD. These questions were used in the PSP as well with minimal adjustments to reflect APE service providers rather than physical education teachers. Additionally, the anchors were changed for consistency. Exploratory factor analysis using a principal component extraction method was performed on

intention items. Missing data in components of the TpB were replaced by the means. See Table 18 for a summary of the results. One factor was extracted (eigenvalue = 3.81) and explained 95.14% of the variance of items. Factor loadings ranged from .97 to .98. Cronbach's alpha tests indicated that the interval consistency of intention was acceptable (.87).

Table 19

Eigenvalues, Factor Loadings, and Cronbach's Alpha Coefficients Intention Items

Intention Items	Cronbach's alpha	Intention
Factor. Intention	0.87	
PSP Q38. I intend to provide services for students like Taylor and Alex.		**0.98**
PSP Q39. I will try to provide services for students like Taylor and Alex.		**0.98**
PSP Q40. I am determined to provide services for students like Taylor and Alex.		**0.97**
PSP Q41. I plan to provide services for students like Taylor and Alex.		**0.98**
Total Variance Explained	95.14%	
Eigenvalues	3.81	

Summary

Participants reported varied backgrounds, as expected participants held different levels of degree, different certifications, and had varied number of years of experience as an APE service provider. The participants represented a sample with mostly master's degrees. Participants reported 5 different undergraduate majors and 4 different graduate majors. Additionally, over half of the participants held certifications in either physical education or special education and many held certification in both. Interestingly, the participants represented a distinct divide between the number of years of experience with approximately two-thirds of participants with 6 or fewer years and approximately one-third of participants with 10 or more years of experience.

The researcher used the first research question to examine the opportunities for developing knowledge about providing services for students with severe disabilities at the

sensorimotor stage of learning. Based on the data analysis, there were differences between the number of courses attended and perceptions of how these courses prepared them to provide APE services for students at the sensorimotor stage of learning. Additionally, differences in the number and formats of professional development (e.g. workshops, conferences, courses, informal collaboration) attended and perceptions of how the PD opportunities prepared them to provide APE services for students at the sensorimotor stage of learning were indicated.

Research question two addressed APE service providers' perceptions of students with severe disabilities at the sensorimotor stage of learning. Based on the data most participants agree that students with severe disabilities at the sensorimotor stage of learning are viewed by many as not being able to learn or do well. Additionally, it was indicated that most APE service providers have experience providing services for students at the sensorimotor stage of learning and was difficult to provide services for these students. Further, APE providers who reported positive experiences also reported higher competency ratings.

The third research question identified the baseline level of perceived confidence of participants providing APE services for students with severe disabilities at the sensorimotor stage of learning. Based on the quantitative data, a correlation between confidence in providing instructional services and other APE responsibilities (e.g., developing Present Level of Academic Achievement and Functional Performance statements, developing measurable annual goals and benchmark objectives, providing accommodations). Additionally, quantitative data indicated participants who completed the PD module were more likely to have increased confidence regarding APE Service Provision. The qualitative data collected through either phone or written interviews supported this increase in confidence.

Research question four identified the most frequently used research-based strategies, evidence-based practices, accommodations, and modifications for students with severe disabilities at the sensorimotor stage of learning were: (a) adapting for safety, (b) repeating directions, (c) modifying fitness testing, (d) changing the rules of the game (68%), and (e) providing visual modeling. The quantitative data indicated participants who completed the PD module were more likely to implement routines and hand under hand guidance. Supporting qualitative data from the phone and written interviews indicated more intentional use of highly effective strategies and understanding of arousal states.

CHAPTER 5

Results

The purpose of the present investigation was to investigate current Adapted Physical Education (APE) service providers' perceptions of students at the sensorimotor stage of learning related to APE Service Provision. Additionally, self-reported changes after a self-paced asynchronous professional development learning experience developed by the researcher were explored. Using a questionnaire developed based on the theory of planned behavior, the researcher collected data about APE service providers' educational and professional background, perceptions of the student population as it relates to APE, level of perceived confidence with provision and other responsibilities, and the implementation of highly effective instructional strategies (Smith et.al, 2020). The researcher examined the self-reported learning opportunities participants had experienced, both pre-service and in-service, to be prepared to provide services for students with severe disabilities at the sensorimotor stage of learning. Participants' information related to perceptions about students with severe disabilities at the sensorimotor stage of learning, level of perceived confidence with APE Service Provision and other responsibilities, and the use of highly effective instructional strategies (Smith et.al, 2020) was then collected again after participation in the *Sensorimotor Guided Practice Workbook* self-paced asynchronous professional development module were administered.

The intent of the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) questionnaire was to report the changes in perceptions based on the new information presented in the *Sensorimotor Guided Practice Workbook* professional development (PD) module. Following the rationale of Guskey's (2002)

'Model of Teacher Change' (see Figure 2), the *Sensorimotor Guided Practice Workbook* PD module developed by the researcher provided participants with information about Service Provision and other responsibilities specific to students at the sensorimotor stage of learning. Study participants were provided opportunities for reflection about personal student scenarios, practice using key instructional materials, and encouraged to implement the highly effective instructional strategies into their current practice (Smith et.al, 2020). Perception is defined as the process of becoming aware through engagement in experiential learning which supports interpretation into meaningful knowledge for coordinated action (Douglas et. al., 2019). Guskey (2002) suggested changes in teachers' perceptions depend on student learning outcomes. When student learning outcomes improve, it is typically related to a change in instructional practices (Guskey, 2002). Therefore, the data were analyzed to examine the self-reported changes in perceptions and practices. The purpose of the final chapter is to discuss the results of the present investigation guided by the following research questions:

1. What preparation opportunities have APE service providers had to develop knowledge to provide services to students with severe disabilities at the sensorimotor stage of learning?
2. What are the self-reported changes in APE service providers' perceptions toward students at the sensorimotor stage of learning following an asynchronous professional development module focused on sensorimotor stage instructional strategies?
3. What are the changes in APE service providers' self-reported level of confidence after participation in an asynchronous professional development learning module?
4. How will APE service providers self-reported implementation of highly effective instructional strategies (Smith et.al, 2020) change after completing an asynchronous professional development learning module?

Conclusions

Conclusion 1: Adapted Physical Education (APE) service providers have the opportunity to build knowledge about providing services for students with severe disabilities at the sensorimotor stage of learning through attending undergraduate courses, graduate courses, and professional development. The APE service providers in the present investigation with special education certifications attend more courses on average than those with physical education certifications. APE service providers attend professional development (PD) within their region most frequently. PD opportunities are perceived to successfully prepare them to work with students with severe disabilities at the sensorimotor stage of learning.

Conclusion 2: APE service providers agree that students with severe disabilities at the sensorimotor stage of learning are often viewed as not being able to learn or do well in physical education. Additionally, these APE service providers see the value in providing APE service for students with severe disabilities at the sensorimotor stage of learning as providing better learning opportunities. Students with severe disabilities at the sensorimotor stage of learning were perceived as being difficult to provide APE services however, the more positive experiences an APE service provider had the higher competence the service provider perceives.

Conclusion 3: Higher levels of confidence in providing APE services for students with severe disabilities at the sensorimotor stage of learning correlates with a higher level of confidence related to developing Present Level of Academic Achievement and Functional Performance (PLAAFP) statements, developing measurable annual goals and benchmark objectives, and providing accommodations for these students.

Conclusion 4: APE service providers' self-reported implementation of research-based strategies, evidence-based practices, accommodations, and modifications indicate

a variety of strategies were used. Further, after completion of the *Sensorimotor Guided Practice Workbook* PD module these providers are more likely to use highly effective instructional strategies specific to students with severe disabilities at the sensorimotor stage of learning (Smith et.al, 2020).

Conclusion 5: Participation in the asynchronous self-paced *Sensorimotor Guided Practice Workbook* professional development was considered useful and relevant. The addition of a collaborative learning opportunity could be perceived as even more beneficial.

Discussion

The remainder of this Chapter consists of two main sections: (a) discussion, (b) limitations, (c) implications, and (d) summary. The conclusions are explained in detail based on the indications of the data analysis and synthesized to address the research questions. The concluding section addresses implications for future educational and professional learning opportunities, data-driven recommendations for beneficial professional development formats, and future research.

Educational and Professional Learning Preparation Opportunities

Based on the analysis of the Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) questionnaire data, the researcher described APE service providers learning opportunities specifically related to students with severe disabilities at the sensorimotor stage of learning. Similar to reviewed literature, the present investigation identified APE service providers had varied educational backgrounds and varied experiences with students with severe disabilities (Kelly & Gransneder, 1998; Lytle et al., 2021; Obrusnikova & Kelly, 2009). The individuals who chose to participate in this investigation were a small representation of the unknown number of APE service providers within the state of

Texas, with the majority of participants being used as APE service providers in either the Region 10 Educational Service Center (ESC) or Region 11 ESC geographical area.

The majority of participants reported having had multiple college courses, as well as, professional development opportunities over the past 3 years focused on students with severe disabilities at the sensorimotor stage of learning. Participants indicated that most had attended at least one or more undergraduate courses with most reporting a neutral response regarding their perceived level of preparation. Conversely, most participants who had attended graduate courses indicated attending two or more and reported these courses slightly prepared them for providing APE services for students at the sensorimotor stage of learning. Further, participants who indicated having more than 10 years of experience reported attending two or more courses related to providing services for students at the sensorimotor stage of learning. While no significance was determined, visual representation analysis indicated a distinction that participants with a certification in physical education or the Certified Adapted Physical Educator (CAPE) recognition reported one course related to students at the sensorimotor stage of learning while participants with a special education certification reported attending two or more courses. Based on the data analysis, the positive significance indicated between the number of undergraduate courses and response rates, as well as, in the number of graduate courses and response rates implies that "more may be better." More courses could provide pre-service teachers with increased learning opportunities to feel better prepared for teaching students at the sensorimotor stage of learning.

In the present investigation, participants were not asked to provide any details or description of the courses attended. Participants were not asked to indicate course requirements, specifically if the course provided direct practicum experiences or instruction in methodology.

McNamara et al. (2022) reported instructors for introductory APE courses at the undergraduate level emphasized the justification for providing direct experiences for pre-service teachers was to establish an empathetic understanding of the possible challenges based on seven university professor interviews. Layne and Blasingame (2018) reported that when opportunities to work with students with severe disabilities were provided, pre-service teachers indicated improvement in their teaching abilities.

When asked about in-service professional development opportunities, the majority of participants attended district or regional workshops and regional conferences. Interestingly, over half of the participants reported participating in formal or informal collaboration with other APE service providers related to students with severe disabilities at the sensorimotor stage of learning. The majority of participants ranked these professional development opportunities positively in regard to preparing them to work with students with severe disabilities at the sensorimotor stage of learning. An interesting note described in Chapter 4 is the significant relationship indicated between the level of degree and attendance of regional APE conferences (p. 111). Further, the relationship between participant's number of undergraduate course and attendance at a state or national level conference session was slightly out of the range of significance. Another important note is the relationship between the years of experience and the participation in informal or formal collaboration with other service providers (Professional Learning Community).

Overall, more participants rated their undergraduate and graduate courses more negatively than the overall participants rated the professional development session attended negatively. There are multiple possible explanations for the different perspectives. The duration of time between taking courses and attending professional development sessions could be dramatically different for some APE service providers. Further, the breadth of information

related to students with severe disabilities at the sensorimotor stage of learning covered over the course could have limited the depth of the information included in the course or courses. While the information related to students with severe disabilities at the sensorimotor stage of learning presented at a professional development, may have been an in-depth focus on these students.

Perceptions Toward Students at the Sensorimotor Stage of Learning Related to APE Service Provision

The researcher determined that the majority of participants reported providing APE services for students with severe disabilities at the sensorimotor stage of learning based on the 2 student profiles. The researcher in the present investigation did not collect any direct information regarding whether APE service providers were able to accurately identify a student at the sensorimotor stage of learning. However, in the interview process APE 3 shared a change in ". . . awareness building for implementation of APE purposes" in response to the interview question about changes in their perceptions of students with severe disabilities at the sensorimotor stage of learning. This could indicate that APE 3 developed a better understanding of the sensorimotor stage learner which ensures more focused APE instruction, but this was not explicitly stated.

Review of relevant literature supports the view that many perceive students with severe disabilities at the sensorimotor stage of learning as being not be able to learn or do well based on the severity of their disabilities (Akuffo & Hodge, 2008). Most of the APE service providers agreed with the statement of this perception. Based on the data analysis, there is a significant positive correlation regarding the value of providing APE service for students with severe disabilities at the sensorimotor stage of learning provides better learning opportunities.

Similar to the study conducted by Sato and Haegele (2017a) who identified students with severe disabilities at the sensorimotor stage of learning are perceived as being difficult to provide APE services, the participants in the present investigation agreed with the perception that students at the sensorimotor stage of learning can be difficult to provide APE services. Further, similar to Sato and Haegele's (2017a), the present investigation indicated the more positive experiences an APE service provider has, the more competence with providing APE services for students at the sensorimotor stage of learning the service provider perceives. Therefore, while there is agreement with the perception that students with severe disabilities at the sensorimotor stage of learning can be difficult to provide APE services for these APE service providers are also aware of the value of providing better learning opportunities for these students.

The researcher was not able to determine a significant relationship between perceived competence and experiences with providing services for students at the sensorimotor stage of learning. However, using descriptive statistics the researcher was able to determine that participants who reported positive experiences with providing APE services for students at the sensorimotor stage of learning also reported a higher level of competency. An interesting note that APE service providers' self-reported perceptions of effective provision of APE services for students at the sensorimotor stage of learning was not reflective or related to the level of self-reported competency. One explanation for the lack of correlation could be that while participants rated their personal level of competency, they were asked to rate the efficacy of the APE service provided at their school in general. Participants' responses could have reflected their perceptions of other APE service providers in their districts or perhaps a reflection of their perceptions of classroom staff (e.g., special education teachers, physical education teachers, paraprofessionals) instruction (Mihajlovic, 2024). Interviewees APE 1 and APE 3 supported this explanation,

reflecting in their comments about other instructional staff in their districts. Further, each stated the intent to share the information presented in the *Sensorimotor Guided Practice Workbook* with colleagues, specifically, physical education teachers.

Confidence Related to APE Services and Responsibilities

The review of literature indicated when teachers are satisfied with their training, they reported higher levels of confidence (Jeong et al., 2021; Layne & Blasingame, 2018). Overall participants reported feeling prepared by both coursework and professional development. The researcher determined a significant positive correlation between all confidence items (e.g., providing services, developing PLAAFP statements, developing annual goals and benchmark objectives, providing accommodations). The self-reported positive ratings of confidence appear to be a result of adequate training through previous coursework and PD attendance.

While the researcher was unable to determine a significant increase in self-reported level of confidence for participants after participating in the *Sensorimotor Guided Practice Workbook* PD module, the mean for each confidence item increased after the *Sensorimotor Guided Practice Workbook* PD module intervention. While interviewee APE 3 did not explicitly state an increase in confidence, the interviewee shared consideration of implementing the strategies and methods that can be considered outside the range of typical APE Service Provision to develop a better understanding of their students at the sensorimotor stage of learning. There are possible explanations for the lack of statistical significance of perceived confidence. Many participants indicated attendance at regional workshops and the regional APE conference. Further, many participants were located in or near the Region 10 Education Service Center (ESC) area. Both Region 10 ESC and the regional North Texas Adapted Physical Education conference have

hosted sessions related to students with disabilities at the sensorimotor stage of learning over the past 5 years. Additionally, consultants in the Region 10 area provide support to instructional staff regarding this population of students.

Implementation of Highly Effective Instructional Strategies

Sato and Haegele (2017a) indicated the need for the implementation of research-based instructional strategies to educate students related to physical education. In the present investigation, participants were asked to indicate the frequency of strategies used with students with severe disabilities at the sensorimotor stage of learning during Service Provision. The researcher did not provide any distinction between the strategies to identify if the strategies were considered research-based strategies, evidence-based practices, accommodations, or modifications. The majority of participants self-reported implementation of accommodations and modifications most often. While the researcher did not directly observe implementation, the reported frequency of accommodation and modification implementation is important to note. Rodgers et al. (2021) conducted a study in the context of mathematics that identified the distinction between accommodations and providing an evidence based practice technique. The researchers concluded that all instructional staff are required to provide accommodations and that specially designed instruction should go beyond providing accommodations.

The only research-based strategy listed was the implementation of routines which slightly more than half of participants reported frequently implementing. Again, the researcher did not directly observe the implementation of routines by participants. Therefore, the researcher was not able to determine if the routines implemented were actually developed to meet the criteria for a sensorimotor routine which are: (a) consistent beginning and ending, (b) steps that occur in the same order, (c) embedded goals, and (d) accommodations and supports that are applied the same

way consistently (Smith & Chambers, 2023). However, the self-reported implementation of routines reflects that slightly more than half of the participants were providing students at the sensorimotor stage of learning with specially designed instruction. Finally, the only evidence-based practice that was reported by participants to be used frequently was providing visual modeling. While this is considered an evidence-based practice, it may not be appropriate for students at the sensorimotor stage of learning if the student has a visual impairment.

Participants provided insight into their daily use of instructional strategies within their comments during the interview opportunities. APE 1 and APE 2 explicitly reported using two of the three highly effective instructional strategies for students at the sensorimotor stage of learning. These strategies were using hand under hand guidance and establishing routines. APE 2 noted establishing generic routines. This statement could indicate APE 2 developed the understanding that there is a distinct difference between implementing a general routine and implementing a sensorimotor routine. APE 1 and APE 3 both reported using the Premack method. Further, APE 3 reported allowing multiple representations of task initiation. This statement could indicate implementation of least to most prompting which is another highly effective instructional strategies for students at the sensorimotor stage of learning.

Smith and Chambers (2023) described highly effective instruction for students with severe disabilities at the sensorimotor stage of learning. The authors emphasized the foundation of routine implementation with consistent accommodations to ensure the highest level of student engagement. Further, the authors highlight the importance of providing the student with the opportunity to actively engage in learning. Hand-over-hand guidance and most to least prompting facilitates passive practice rather than active engagement in learning. Conversely,

hand under hand guidance and least to most prompting facilitates active engagement. Therefore, the researcher was interested in exploring the implementation of these strategies.

Unfortunately, the researcher was not able to determine a significant increase in the participants' self-reported implementation of routines, hand under hand guidance, or least to most prompting after participation in the *Sensorimotor Guided Practice Workbook* PD module. However, the researcher was able to determine a moderate effect on participants' implementation of routines and a small effect on participants' use of hand under hand guidance after the *Sensorimotor Guided Practice Workbook* PD module intervention. APE 1 interviewee specifically referenced the hand under hand information in the *Sensorimotor Guided Practice Workbook* PD module as a reminder to be more intentional with strategy implementation.

One explanation for the limited increase in self-reported implementation of highly effective instructional strategies is the short duration between PD module completion and posttest submission (p. 144). This is evident in APE 2 interviewee's response that changes in implementation had not occurred because the students at the sensorimotor stage of learning ". . . had not been seen yet." Another explanation is that participants' self-reported implementation of the highly effective strategies after the *Sensorimotor Guided Practice Workbook* PD module intervention did not increase because participants were more aware of the highly effective strategies that are more relevant to students at the sensorimotor stage of learning (Smith et.al, 2020). The written interview response by APE 2 alluded to establishing routines but acknowledged that the routines were "generic" rather than adhering to the criteria for a sensorimotor routine.

Sensorimotor Guided Practice Workbook Professional Development Module

The development of the *Sensorimotor Guided Practice Workbook* was guided by the researcher's experiences and training with the primary author of the Sensing and Learning program (Smith et.al, 2020). The structure and flow of the PD module was similar to the structure of the original training with Smith (2014-2017). However, there were significant differences in the amount of time spent engaged in learning and the opportunity for collaborative experiences. In the original training participants chose a case study student and worked through the process with the student. Participants also had the option to implement strategies with other students. However, data collection focused on the specific case study student. While this was not within the scope of the present investigation, the inclusion of opportunities for reflection and practice were developed by the researcher to provide participants with a similar experience. Throughout the original training, instructional and related staff had the opportunity to observe student routines either directly or through video. The inclusion of the embedded videos provided the participants with a similar experience because the videos in the investigation were developed during the original training and documented the students' progress.

During the original training, participants attended a full day training session prior to implementation of the case study research. During each monthly session with Smith, participants experienced a brief training session based on the student data and concerns communicated by the staff. The researcher was not able to provide participants with similar experiences related to collaboration. Based on the data collected through the PSP questionnaire, many participants indicated participation in formal or informal collaboration with other service providers (Professional Learning Community). The addition of this opportunity through direct collaboration or video chat sessions could be a beneficial addition to the *Sensorimotor Guided*

Practice Workbook PD module. Healy, Bock, and Judge (2014) documented advantages of online professional development collaboration. These advantages were: (a) sharing strategies, (b) increase network opportunities with others in various geographical locations, (c) feedback from service providers in other states, and (d) exposure to different perspectives, approaches, and experiences (p. 15).

Each interview participant provided positive feedback about the PD module. APE 1 stated "The timeframe for the PD was perfect. It wasn't too long or too short. A new person to APE could get a lot out of this PD in a short amount of time and get more bang for their buck." APE 2 shared, "It was a lot of really good information and something that I'm going to use as a reference moving forward." APE 3 shared "It was useful and effective in allowing me the opportunity to use the guidelines with a new student on my caseload and to share this with the PE teacher. I believe that this could have a bigger impact in broader share in our APE community."

Limitations of the Study

The primary limitation of this investigation was the small sample size and low response rate which could influence the generalization of the findings. As described previously, to the knowledge of the researcher a comprehensive list of APE service providers for Texas is not available. Professionals with varied certifications (i.e., physical education certification, special education certification) are used to provide APE services in Texas (Texas Register, 2020) due to the broad definition provided by Education for All Handicapped Children Act (EAHCA, 1975) and Individuals with Disabilities Education Improvement Act (IDEIA, 2004). Therefore, sample development relied on using convenience and snowball sampling strategies. Additionally, while the online platform (Qualtrics) has many beneficial features, the emails distributed through

Qualtrics were often blocked by district security measures. This impacted the researcher's initial contact with potential participants. Further, many potential participants' participation could have been influenced by the responsibilities of their current position and the time required for participation in the investigation. Multiple local and area Special Olympics events occurred throughout the recruitment and investigation participation duration. Many of these events are ongoing year round, finding the most opportune time to launch the investigation was a challenge. Despite multiple email communication attempts, extension of the recruitment period, and extension of initial questionnaire completion, the response rate remained low.

The researcher intentionally restricted the investigation to professionals used to provide APE services in Texas due to the inconsistency of who is eligible to provide APE services across states. The researcher explored educational and professional backgrounds of participants in relation to providing APE services. While in most states, APE service providers must have a teaching certification, the type of certification required is inconsistent. The researcher was able to examine participants' backgrounds in relation to the requirements in Texas that a professional must have either a certification in physical education or special education (Texas Register, 2020). Therefore, the results may not be generalized to APE service providers in other states (Wetzel, 2007).

Another limitation to note is the research design, specifically the primary data collection instrument, may have been influenced by participants' recall and self-awareness. This could have influenced multiple areas of data collection. Participants' recall and perceptions of college courses and professional development (PD) sessions attended specific to students with disabilities at the sensorimotor stage of learning could have been influenced by the passage of time from taking these courses or PD sessions. Further, participants may have been unaware of

the type of information that would be necessary in these courses or PD sessions to prepare them to teach students at the sensorimotor stage of learning. This is evident in the participants' reported higher frequency of accommodations and modifications implemented rather than the frequency of research-based strategies and evidence-based practices implemented by participants.

Further, the results of the investigation were based on participants' self-reported perceptions. Participants reported fairly high levels of confidence in the initial pretest data collection. Without any direct observation of instruction or review of Individual Education Program (IEP), the researcher is not able to confirm the level of accuracy of APE service provider's statements. Further, participants' perceptions of the characteristics of a student with severe disabilities at the sensorimotor stage of learning may not have been accurate in the initial data collection. This is also relevant to the implementation of accommodations, modifications, research-based strategies, and evidence-based practices.

It is important to consider the amount of time available for participants to engage in the self-paced asynchronous professional development module. This could have been limited due to the requirements of their current employment, as well as, daily life activities (e.g., workload demands, family obligations). Further, the short duration of time after completion of the *Sensorimotor Guided Practice Workbook* PD module before the end of the investigation and the timing of Spring Break could have influenced participants' ability to apply the information and strategies they learned. Additionally, participants' students with severe disabilities at the sensorimotor stage of learning could have been unavailable for application due to various reasons (e.g., illness, extended state, classroom schedule).

Finally, based on the pretest-posttest data analysis, a very small number of participants were able to complete the pretest questionnaire, asynchronous self-guided professional development module, and the posttest questionnaire process. Again, completion of the whole process could have been influenced by participants' employment requirements and daily life activities. Additionally, the timing of Spring Break could have influenced participants' ability to complete the process. The completion rate remained low despite multiple email reminders.

Implications

Over the course of this investigation, the researcher reviewed relevant literature, researched theoretical frameworks and a model of teacher change, developed a self-paced asynchronous professional development model based on Piaget's Theory of Cognitive Development, modified a questionnaire based on the theory of planned behavior, recruited participants, monitored investigation completion, analyzed the data, and reviewed the findings. The following implications related specifically to students with severe disabilities at the sensorimotor stage of learning were identified: (a) Adapted Physical Education (APE) preparation programs, (b) APE instructional practices, (c) data-driven professional development, (d) *Sensorimotor Guided Practice Workbook* baseline data, and (e) future research.

APE Service Provider Preparation

The present investigation contributes to the current literature by providing a retrospective account of pre-service preparation. Further, the researcher gathered information related to both undergraduate and graduate courses to gain insight about the learning opportunities available related to the needs of students with severe disabilities at the sensorimotor stage of learning. The significant positive correlation between the number of courses at both the undergraduate and graduate level with the rating response suggests that the number of courses attended is critical to

preparedness. APE service providers with special education certifications reported taking more courses related to students with severe disabilities at the sensorimotor stage of learning. Based on the findings, it may be beneficial to require pre-service physical education teacher candidates to take more than one course related to students with severe disabilities at the sensorimotor stage of learning to better prepare them to provide APE services for this population of student. Furthermore, reorganizing course content in currently available courses to address instructional strategies and practices relevant to students with severe disabilities at the sensorimotor stage of learning would support knowledge development. Finally, the addition of experiences with students with severe disabilities at the sensorimotor stage of learning to current practicum opportunities could be beneficial.

While participants rated their courses positively, most perceived only being slightly prepared for providing services for students with severe disabilities at the sensorimotor stage of learning. This is evident in the types of instructional strategies most frequently implemented by APE service providers as well. Preservice teacher candidates are learning how to adapt and modify activities. However, the limited depth of instructional practices and strategies is due to the breadth of content that must be covered in courses (McNamara et al., 2022). Further, pre-service teacher preparation programs are providing pre-service teacher candidates with hands-on learning opportunities however, the goal of these opportunities seems to be to prepare the candidates by establishing an empathetic understanding of the possible challenges (McNamara et al., 2022). Based on these findings, pre-service teacher candidates are entering practicum situations without the necessary pedagogical knowledge. Future researchers should focus on typical course content that would provide insight into the pedagogy learning opportunities available for pre-service APE service providers.

Adapted Physical Education Instructional Practices

As previously discussed in Chapter 2, Adapted Physical Education can be provided in many different ways. Stated in the Education for All Handicapped Children Act (EAHCA) students receiving special education services must be provided specially designed instruction based on their unique needs further specifying in physical education instruction among the other academic and functional areas (PL 94-142, 1975). The Individuals with Disabilities Education Improvement Act (IDEIA) expanded and refined the definition of physical education to include adapted physical education (Code of Federal Regulations, 2023). This suggests that APE is considered to be specially designed instruction which means APE service providers must go beyond providing accommodations and modifications.

The limited self-reported implementation of research-based strategies and evidence-based practices suggests the need for intentional training. Perhaps the frequency of implementation of accommodations and modifications supports the literature highlighting that the lack of training can result in an increase in using ". . . quick fixes" rather than implementing highly effective strategies (Sato & Haegele, 2017a). Future research to explicitly explore course content to determine the depth and breadth of instruction on research-based strategies and evidence-based practices specifically focused on students with severe disabilities at the sensorimotor stage of learning are needed.

Data-driven Professional Development

The review of relevant literature highlighted the positive influence of professional development opportunities for APE service providers. Informed instruction leads to higher quality instruction and perceived success as APE service providers observe positive student outcomes (Akuffo & Hodge, 2008; Ammah & Hodge, 2005; Hodge et. al., 2003; Hodge et al.,

2004; Hodge et al. (2009) Sato & Haegele, 2017b). Interviewee APE 3 shared an example of a student who now seems to be increasing attention to objects while in an alert arousal state. Further, APE 3 shared their motivation to apply learned strategies in alternative ways and hopes to collaborate with other service providers.

Participants in the present investigation indicated a higher frequency in attending regional PD opportunities. Future research about PD opportunities offered throughout the regions of Texas specifically related to students with severe disabilities at the sensorimotor stage of learning would provide insight into the availability of this type of training and where training might be geographically limited. Further, the limited use of research-based strategies and evidence-based practices indicates a need for research into the content of the PD opportunities focused on the needs of students with severe disabilities at the sensorimotor stage of learning.

Finally, many participants indicated participation in formal or informal collaboration with other service providers. With that in mind and being mindful of the challenge with investigation recruitment and completion, professionals providing PD opportunities should consider a collaborative case study approach.

Sensorimotor Guided Practice Workbook

As stated previously, the *Sensorimotor Guided Practice Workbook* was developed based on the researcher's own experience and training (Smith et.al, 2020). However, two critical components were not included in the investigation. Implementation of a case study approach and formal collaboration with other service providers were foundational to the original training. The interview comments were positive, and each interview participant indicated referencing and sharing the information moving forward. Further, data collected through the PSP indicated even when APE service providers perceived competence in their abilities to provide services for

students with severe disabilities at the sensorimotor stage of learning it did not result in a signification indication of Service Provision effectiveness. Therefore, it seems the next step for the *Sensorimotor Guided Practice Workbook* PD module would be to revise the current *Sensorimotor Guided Practice Workbook* PD module to include a collaborative case study approach.

Summary

Based on the results, the pretest-posttest one group research design provided insight into the current APE instructional practices in the Region 10 Educational Service Center and Region 11 Educational Service Center geographical area. The researcher explored current APE service providers learning opportunities in order to determine the current state of preparedness to provide services for students with severe disabilities at the sensorimotor stage of learning. The researcher provided a retrospective account of pre-service preparation in part to determine if APE service providers were prepared to provide specially designed instruction for students with severe disabilities at the sensorimotor stage of learning. The Individuals with Disabilities Education Improvement Act (IDEIA, 2004) requires educators to go beyond providing accommodations and modifications by adapting the methodology and delivery of instruction based on each student's unique learning needs. Study participants indicated feeling slightly prepared by undergraduate and graduate courses to provide APE services for students with severe disabilities at the sensorimotor stage of learning. However, the recommended research-based strategies and evidence-based practices were reported to be used less frequently than accommodations and modifications.

APE service providers reported additional learning opportunities through regional professional development. An important finding in this investigation is that APE service

providers frequently engage in formal or informal collaboration with other service providers. This finding provides valuable insight for professional development instructors when considering formats to support APE service providers' successful learning opportunities (Healy et al., 2014). The significant correlation between confidence in providing APE services and confidence in being able to fulfill other role responsibilities (e.g., developing a PLAAFP, developing measurable annual goals and benchmark objectives, providing accommodations) highlights the importance of effective coursework and professional development. Recommendations about course and professional development content (e.g., instructional practices, methodology, delivery of instruction) and format for districts, professional development instructors, and course instructors are provided in Appendix L. Further, the data collected provides the researcher with critical information that will be used during the revision of the *Sensorimotor Guided Practice Workbook* PD module. Finally, the present investigation confirmed that APE service providers see the value in high quality learning opportunities for students with severe disabilities at the sensorimotor stage of learning.

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Appendix A

Adapted Physical Education Service Providers Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) Pretest

General Instruction

This questionnaire is an investigation that tries to discover the perceptions and challenges of adapted physical education service providers related to providing APE services for sensorimotor stage learners. There are no right or wrong answers. When given multiple options, please check all that apply

Many of the questions on this questionnaire use a rating scale of 7 points. Please check the number that corresponds best with your beliefs and opinions. For example, if you fully and completely understand these instructions, put a CIRCLE on the DEFINITELY YES as shown below.

DEFINITELY NO : 1 : 2 : 3 : 4 : 5 : 6 : 7 : DEFINITELY YES

Sensorimotor Stage Learner

Consider the possibility of having a Sensorimotor Stage Learner on your caseload.

Study Terminology:

Severe disability: Refers to individuals with multiple impairments, including cognitive, visual, hearing, orthopedic, and communication impairments with medical complications who demonstrate limited environmental awareness and voluntary movement (Jansma, 1999; Vogler et al., 2000; Sherrill, 2014).

Sensorimotor stage of learning: The earliest stage (birth to 2 years) in Jean Piaget's theory of cognitive development, when learning occurs through a child's sensory and motor interactions with their physical environment.

Providing APE Service for a Students Like Taylor and Alex

Taylor has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Taylor utilizes a wheelchair and is dependent on others for both pushing the wheelchair and transitions into and out of the wheelchair. Taylor is not able to follow verbal directions. Taylor can reach and grasp objects. However, it takes an extended amount of time for movement. Taylor sleeps during the day and can be fussy. Taylor does not seem to engage with classmates. When given an object, Taylor may drop the object away. Taylor allows physical manipulation of the arms, hands, legs, and feet by adults during activities.

Alex has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Alex is ambulatory and wears ankle-foot orthoses and a scoliosis brace. Alex typically walks at a reduced pace with stand by support for safety. Alex can transition from standing to sitting and sitting to standing with support. Alex can manipulate

objects by grasping, releasing, banging, swiping, dropping, and is beginning to toss objects in an intended direction for a short distance. Alex can reach for a floating balloon and pull the balloon to his body in an attempt to catch. Alex enjoys looking at and interacting with familiar adults and peers. Alex will protest when not feeling well or not interested in an activity. Alex can make choices and communicate wants with pictures and an Augmented and Alternative Communication (AAC) device.

1. Have you ever provided APE services for students similar to Taylor and Alex?

   Yes ___ No ___

2. If yes, how similar are the students you have provided APE services to Taylor and Alex?

   No experience ___ Not at all Similar ___ Somewhat ___ Similar ___ Very Similar ___

Now, please respond to each question about sensorimotor stage learners below using the 7 point rating scale provided.

- Please think carefully about which part of the 7 point scale best describes your beliefs and perceptions.
- Please be sure you answer all items-please do not omit any.
- Please never put more than one check mark on a single item.
- All responses will be kept anonymous.

Please share your attitude toward providing APE services for students like Taylor and Alex.

Providing APE services for students like Taylor and Alex would be:

1. Extremely harmful	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Extremely beneficial
2. Extremely bad	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Extremely good
3. Extremely worthless	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Extremely useful

Please share your perceptions of what others think about APE service provision for students like Taylor and Alex.

4. Most people who are important to me think that I should include students like Taylor and Alex on my caseload.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

5. It is expected that I provide APE services to students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

6. I feel under social pressure to provide APE services to students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perception of your ability to provide APE services for students like Taylor and Alex.

7. I am confident in my ability to provide APE services for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

8. I am confident in my ability to develop a Present Level of Academic Achievement and Functional Performance statement for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

9. I am confident in my ability to develop measurable annual goals and benchmark objectives for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

10. For me to provide APE services to students like Taylor and Alex would be extremely difficult.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

11. In general, I can provide accommodations for students like Taylor and Alex.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

12. Whether I provide APE services effectively for students like Taylor and Alex or not is mostly up to me.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your beliefs about providing APE services for students like Taylor and Alex.

13. Students like Taylor and Alex who are provided APE services would be required to participate in activities that are inappropriate for Taylor and Alex's abilities.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

14. Requiring Taylor and Alex to participate in activities would be inappropriate for Taylor and Alex's abilities.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

15. Providing APE services for students like Taylor and Alex would provide students like Taylor and Alex with a better opportunity to learn.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

16. Increasing opportunities to learn for students like Taylor and Alex would be valuable.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

17. Providing APE services for students like Taylor and Alex would be safe for Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perceptions of expectations of others for APE service provision for students like Taylor and Alex.

18. Most parents of students with disabilities think that I should provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

19. Generally speaking, I would do what most parents of students with disabilities think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

20. Most organizations (TAPHERD, APENS) supporting people with disabilities think that I should provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

21. Generally speaking, I would do what most organizations supporting people with disabilities think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

22. Most adapted physical educators think that I should provide APE service for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

23. Generally speaking, I would do what other adapted physical educators think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

24. My school administrator thinks that I should provide APE service for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

25. Generally speaking, I would do what my school administrator thinks I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perceptions of external factors when providing APE services for students like Taylor and Alex.

26. I have paraprofessional support when I provide APE services for students like Taylor and Alex.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

27. Limited paraprofessional support when providing APE services for a student like Taylor and Alex makes providing APE services for students like Taylor and Alex more difficult.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

28. I have appropriate equipment for students like Taylor and Alex available.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

29. Limited appropriate equipment available makes providing APE service for students like Taylor and Alex impossible.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

30. There are materials and programs available to help me provide APE services for students like Taylor and Alex.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

31. Having access to materials and programs available would make providing APE services for students like Taylor and Alex easier.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

32. Various in-service programs related to adapted physical education provided in my district.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

33. Having access to various in-service programs related to adapted physical education would make providing APE services for students like Taylor and Alex easier.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

34. Usually, people have a prejudice against students like Taylor and Alex, and believe these students cannot learn and do well.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

35. Having limited professional knowledge to provide APE services makes providing APE services for students like Taylor and Alex more difficult.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

36. There are administrative supports to provide APE services for students like Taylor and Alex in my district/charter.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

37. Having limited administrative supports to teach students like Taylor and Alex in my district/charter makes providing APE services for students like Taylor and Alex impossible.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your intentions to provide APE services for students like Taylor and Alex.

38. I intend to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

39. I will try to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

40. I am determined to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

41. I plan to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Adapted Physical Education Service Provision Perceptions

42. How many students like Taylor and Alex have you provided APE services for in the past 3 years?

Approximately _____ Number of students like Taylor and Alex

43. If you have provided APE services for students like Taylor and Alex, what was your experience with students like Taylor and Alex?

Extremely bad : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Excellent

44. How competent do you feel to provide APE services for a student like Taylor and Alex?

___ Not at all competent ___ Somewhat competent ___ Competent ___Very competent

45. Please indicate your perception of the following statement:

Students with severe disabilities at the sensorimotor stage of learning are provided effective APE services at my school.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

46. Where do you believe that students like Taylor and Alex should receive physical education?

General Physical Education Setting: _____

PE in Separate Class: _____

Other (describe): _____

47. In your district/charter, can you exclude a student like Taylor and Alex from receiving APE services?

___ Yes ___No

48. What was the reason(s) for excluding students like Taylor and Alex from being provided APE services? Please check all that apply.

1. ___ Safety concerns.
2. ___ No paraprofessional support.
3. ___ Lack of preparation.
4. ___ Assessment issues.
5. ___ Extra burden.
6. ___ No equipment.
7. ___ Lack of knowledge about APE.
8. ___ Inappropriate PE program for students with disabilities.
9. ___ Other: _____

49. If you have total freedom to choose, would you provide APE services to students like Taylor and Alex?

Yes _____ No _____

Adapted Physical Education Service Provision

50. With the students like Taylor and Alex that you have provided APE services for, how often did you provide the following research-based strategies, evidence-based practices, accommodations, and modifications for these students?

Repeat directions	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Assign a peer tutor	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Change rules of the game	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Adapting for safety	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always

Provide adapted equipment	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide extra skill instruction	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Modify fitness testing	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Give special reinforcement	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Implement a routine	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide least-to-most prompting	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide most-to-least prompting	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide hand-over-hand guidance	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide hand-under-hand guidance	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide tactual modeling	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide visual modeling	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide one-on-one instruction	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always

Professional Background

51. Gender Female _____ Male _____ Other _____

52. Age _____ Years

53. What ethnicity most closely identifies you. Please check only 1 category:

_____ American Indian or Alaska Native
_____ African American
_____ Native Hawaiian or Other Pacific Islander
_____ Asian
_____ Hispanic or Latino
_____ Caucasian
_____ Other: _____

54. Major/Degree Undergraduate _____

Master's Program _____

Doctoral Program _____

55. Teaching certification(s)? Check all that apply and indicate what year you became certified.

_____ Certified Adapted Physical Education Year: _____

_____ Physical Education Year: _____

_____ Special Education Year: _____

Other: _____

56. What level of students do you provide APE services? Check all that apply.

Preschool _____

Elementary _____

Middle School _____

High School _____

18+ Adult Learners _____

57. What Region are you in? _____

58. How long have you provided APE services?

    1-3 years _____

    4-6 years _____

    7-10 years _____

    More than 10 years _____

Preservice Teacher Preparation

59. How many undergraduate course(s) have you taken in physical education or special education that address the needs of students with severe disabilities at the sensorimotor stage of learning?

    None _____

    One _____

    Two or more _____

60. This course (or courses) helped prepare you to provide APE services for students like Taylor and Alex.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

61. How many graduate course(s) have you taken in physical education or special education that address the needs of students with severe disabilities at the sensorimotor stage of learning?

    None _____

    One _____

    Two or more _____

62. This course (or courses) helped prepare you to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

In-service Professional Development

63. How many workshops, conferences, and in-service programs related to physical education for students like Taylor and Alex have you attended in the past 3 years?

_____ number of time(s)

64. If you had professional development related to students with severe disabilities at the sensorimotor stage of learning, what was the format?

_____ Attendance at a district or regional workshop on sensorimotor stage learning.

_____ Attendance at a regional APE conference session focused on sensorimotor stage learning.

_____ Attendance at a national or state APE conference session focused on sensorimotor stage learning.

_____ A formal college/university course on teaching students at the sensorimotor stage learning.

_____ Observation of other APE service providers as part of your own professional development/mentoring (formal or informal).

_____ Formal or informal collaboration with other APE service providers (Professional Learning Community).

Other: _____

65. These professional development learning opportunities helped prepare you to provide APE services for students like Taylor and Alex

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Appendix B

Institutional Review Board Approval

Slippery Rock University of Pennsylvania

TO: Dr. Jessica Hall-Wirth
Special Education

FROM: _____
Michael Holmstrup, Ph.D., Chairperson
Institutional Review Board (IRB)

DATE: December 8, 2023

RE: Protocol #: 2024-029-88-A
Protocol Title: Adapted Physical Education Service Providers' Perceptions of Sensorimotor Stage Learners

The Institutional Review Board (IRB) of Slippery Rock University received the requested modifications to the above-referenced protocol.

The IRB has reviewed the modifications and approved the protocol under the EXEMPT category of review.

You may begin your project as of December 8, 2023. Your protocol will automatically close on December 7, 2024, unless you request, in writing, to keep it open.

Please contact the IRB Office by phone at (724)738-4846 or via email at irb@sru.edu should your protocol change in any way.

Appendix C

Approval to Use Questionnaire

RE: Permission to Use Questionnaire for Dissertation

Mihye Jeong <mjeong@esu.edu>
Tue 8/29/2023 3:40 PM
To: Campbell, Angela D <adc1013@sru.edu>
Hi Angela,

I apologize for not noticing your emails earlier. I got an email from Dr. Block and rechecked! Sorry for that.

Yes, you have permission to modify and use the questionnaire.
However, I recommend that you consider making further modifications to the survey.
It seems that the questionnaire is quite extensive due to adhering to Ajzen's direction in creating the questionnaire and is all based on the Korean Physical Education Teachers from the pilot study. In order to make it more efficient and applicable, I suggest you make a thorough revision. Thank you!

Appendix D

Site Approval

September 5, 2023

Title of Study: Confidence of Adapted Physical Education Providers
Principal Investigator(s): Dr. Jessica Hall-Wirth
Angela Campbell

To the Slippery Rock University IRB,

As a representative of Region Education Service Center who maintains the Adapted Physical Education service providers Listserve, I confirm permission is granted for the proposed research: Confidence of Adapted Physical Education Providers to be conducted once IRB approval has been obtained.

April Estrada
Printed Name of Representative

April Estrada
Signed Name of Representative

9/19/2023
Date

Appendix E

Email Message Inviting Adapted Physical Education Providers to Complete the Adapted Physical Education Service Providers" Perceptions of Sensorimotor Stage Learners' Service Provision Questionnaire and Participate in the Adapted Physical Education Service Providers" Perceptions of Sensorimotor Stage Learners Study

Email Title

Please Respond to Participate in the Adapted Physical Education Service Providers Perceptions of Sensorimotor Stage Learners Study

Email Message

My name is Angela Campbell, and I am currently pursuing a Doctor of Education in Special Education at Slippery Rock University. I am conducting research on the self-reported learning following an asynchronous self-paced professional development module on APE service providers' perceptions toward working with students within the sensorimotor stage of learning. Throughout my 25 years as a special education teacher and Adapted Physical Education itinerant teacher in various districts, I've noticed a huge need for teachers, both special education and Adapted Physical Education teachers, to have a better understanding of how to provide quality, evidence-based instruction for our students with severe disabilities. Further, I feel this is critical to improving the quality of life for our students and families. Your responses before and after the professional development learning opportunity will help me understand the current APE service providers' perceptions of students with severe disabilities at the sensorimotor stage of learning and the alignment of current APE service providers practices with research-based and evidence-based practices.

The pre intervention questionnaire will take approximately 20 minutes to complete. The professional development module is self-paced and will take approximately 4 hours to complete. Participants will be given a three week window to complete the module. The professional

development module is a digital guided practice workbook with brief video presentations, embedded videos, and resources to support implementation of strategies and practices. After completion, participants will be sent a post intervention questionnaire which will take approximately 10-15 minutes to complete. A small number of participants will be randomly selected for a follow-up interview to provide feedback about the professional development module.

Your participation in this study is completely voluntary and confidentiality will be upheld. Individual privacy will be maintained in all published and written data resulting from the study. The results will be communicated in the subsequent dissertation and an abstract of the study will be provided to participants. You can withdraw your permission at any time during this project without any penalty. There are no foreseeable risks in participating in this study other than time away from normal activities. I am asking each of you to share the email with other APE service providers to support study recruitment.

The Slippery Rock Institutional Review Board has approved this study. Should you have any comments or questions, please feel free to contact me at adc1013@sru.edu or (940) 453-8644. Thank you for your time and consideration. Participation and feedback are very important to my research.

Angela Campbell

Slippery Rock University

Doctoral Student

Appendix F

Overview of Sensorimotor Guided Practice Workbook
Section 1 Introduction: Foundation and Structure of the Professional Development Module
Approximate completion for each of the four sections - 30 minutes.
Embedded videos throughout the workbook.
Multiple choice quizzes at the end of each section must be completed.
Development of professional development module based on case study and training experiences with Millie Smith a consultant for the American Printing House for the Blind.
Sensing and Learning program resources embedded in each section.
Guided activities such as Pronto Practice, Reflective Questions, and practice writing PLAAFPS, Lesson Plans, and Goals and Objectives.
Section 2: What is a Sensorimotor Stage Learner?
Theories supporting instructional strategies.
Extended States and 3 Zones of Proximal Development
Description of Extended States - Student is not ready for learning.
Description of Attention Zone - Foundational zone for sensorimotor stage learning.
Description of Exploration Zone - Main function of a sensorimotor stage learner.
Description of Function Zone - Understanding purpose of objects and verbal language.
Section 3: How do we create a PLAAFP statement?
Data Gathering - Collaboration
Data Gathering - Planning
Data Gathering - Observation
Response Behavior Description - Attention Zone
Response Behavior Description - Exploration Zone
Sensorimotor Exploratory Schemes and Procedures
Response Behavior Description - Function Zone
Interpreting the Data
PLAAFP Development

Section 4: How do we TEACH our Sensorimotor Stage learners?
Collaboration: Bringing our perspective to the table.
Research-based Strategy: Routines
Accommodations
Sensorimotor Routine Lesson Plan
Section 5: How do we write Goals for our Sensorimotor Stage learners?
Goals and Benchmarks
Conditions
Routine Implementation
APE Provider Role
Connecting to Physical Education Curriculum and Standards

Slippery Rock University

Appendix G

Consent to Participate in Research

College of Education

Departments of:
Counseling and Development
Elementary Education/Early Childhood
Physical and Health Education
Secondary Education/Foundations of Education
Special Education

CONSENT TO PARTICIPATE IN RESEARCH

ADAPTED PHYSICAL EDUCATION SERVICE PROVIDERS PERCEPTIONS OF SENSORIMOTOR STAGE LEARNERS

Dr. Jessica Hall-Wirth Ed.D, jessica.hall-wirth@sru.edu, 724-738-2856

Angela Campbell M.S., adc1013@sru.edu, 940-453-8644

Invitation to be Part of a Research Study

You are invited to participate in a research study. In order to participate, you must be a current Adapted Physical Education service provider. Taking part in this research project is voluntary.

Important Information about the Research Study

Things you should know:

- The two purposes of this investigation are to examine APE service providers perceptions related to providing APE services for students with severe disabilities at the sensorimotor stage of learning and to examine the self-reported use of instructional practices and strategies before and after a self-paced asynchronous professional development learning module. If you choose to participate, you will be asked to complete a questionnaire before and after participating in a self-paced professional development module. This process will take approximately five hours total. A small number of participants will be randomly selected to participate in brief feedback interviews about the professional development module.
- Risks or discomforts from this research include time away from normal activities.
- The study will provide participants with a professional development learning opportunity.
- Taking part in this research project is voluntary. You do not have to participate, and you can stop at any time.

Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

What is the Study About and Why are We Doing it?

The study is about exploring current APE service providers perceptions related to providing APE services for students with severe disabilities at the sensorimotor stage of learning. Additionally, the self-reported use of instructional practices and strategies before and after a self-paced asynchronous professional development learning module will be examined to determine the extent of alignment with research-based strategies and evidence-based practices recommended in the research literature. Data collected will support the development of recommendations to inform professional development and course instructors' effective PD and teacher preparation programming for students at the sensorimotor stage of learning.

What Will Happen if You Take Part in This Study?

If you agree to take part in this study, you will be asked to complete a questionnaire before and after participating in a self-paced professional development online module. We expect this to take no more than 30 minutes for each questionnaire and 4 hours across 2 weeks total time to complete the professional development module.

How Could You Benefit From This Study?

You might benefit from being in this study because you may learn new instructional strategies to implement in your current position. Your participation in this study will provide information regarding the effectiveness of the professional development learning experience that may benefit future APE service providers.

What Risks Might Result From Being in This Study?

We do not believe there are any risks from participating in this research other than time away from normal activities. All responses will be kept anonymous and no personally identifiable information will be associated with your responses to any reports of these data.

How Will We Protect Your Information?

To protect your privacy, we will not include information that could directly identify you. We will protect the anonymity of your research records by maintaining all data on a password protected device. Your name and any other information that can directly identify you will be stored separately from the data collected as part of the project.

What Will Happen to the Information We Collect About You After the Study is Over?

We will not keep your research data to use for future research or other purposes. Your name and other information that can directly identify you will be deleted from the research data as part of the project.

What Other Choices do I Have if I Don't Take Part in this Study?

If you choose not to participate, there are no alternatives.

Your Participation in this Research is Voluntary

It is totally up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer. If you decide to withdraw before this study is completed, information that has been collected at that time will be destroyed. If you are unable to complete any part of the study within the required timelines, you will be excluded from the study and your information will be destroyed.

Contact Information for the Study Team and Questions about the Research

If you have questions about this research, you may contact:

Dr. Jessica Hall-Wirth Ed.D, jessica.hall-wirth@sru.edu, 724-738-2856

Angela Campbell, adc1013@sru.edu, 940-453-8644

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the following:

Institutional Review Board
Slippery Rock University
104 Maltby, Suite 302
Slippery Rock, PA 16057
Phone: (724)738-4846
Email: irb@sru.edu

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. I/We will give you a copy of this document for your records. I/We will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about and my questions so far have been answered. I agree to take part in this study. I understand that I can withdraw at any time. A copy of this signed Consent Form has been given to me.

_____	_____	_____
Printed Participant Name	Signature of Participant	Date

By signing below, I indicate that the participant has read and to the best of my knowledge understands the details contained in this document and have been given a copy.

_____	_____	_____
Printed Name of Investigator	Signature of Investigator	Date

Appendix H

Welcome!

Sensorimotor Guided Practice Workbook

Introduction and Structure of the Professional Development Module

Learning Objectives:

- Distinguish characteristics of sensorimotor stage learners.
- Demonstrate understanding of Vygotsky's Zones of Proximal Development.
- Analyze opportunities for student engagement with objects, people, and actions.
- Evaluate your role as a collaborative instructional team member.
- Demonstrate your understanding of the process of developing a Present Level of Academic Achievement and Functional Performance (PLAAFP) for a sensorimotor stage learner.
- Distinguish the key characteristics of the instructional strategy: "Routines."
- Demonstrate your ability to script an instructional routine using the Sensorimotor Routine Lesson Plan.
- Identify key components included in goals and benchmarks
- Demonstrate your ability to write an annual goal and benchmark objectives for a sensorimotor stage learner.
- Describe Adapted Physical Education (APE) service providers' opportunities for supporting routine implementation.

Each section will take approximately 30 minutes to complete. You will have the opportunity to watch embedded videos as you work through your guided practice workbook. Additionally, you will work through student scenarios and have access to additional resources. The information included in your guided practice workbook is just for you. You will not need to share this information with the researcher or anyone else unless you choose to share. At the end of each section, you will find a link to a google form quiz with 3 multiple choice questions. These questions provide the data to analyze the fidelity of implementation. You should have been assigned a random ID number when you completed the pre-intervention questionnaire. Please enter this number on each quiz. Let's begin!

Take a minute to think about students you currently provide APE services that you think may be a Sensorimotor Stage Learner. Jot down 3 characteristics you have observed while working with them.

1.

2.

3.

When you agreed to participate in this study, you may have not heard the term sensorimotor stage learning. Or, you may have experience with learners at this stage but may need instructional strategies that support positive student outcomes. Some schools refer to these students by broad terms such as students with severe disabilities, severe and profound impairments, high support needs, or by a class or program name such as "active learning." Many times, the term "sensorimotor" has been associated with students who have visual impairments, auditory impairments, or both. Through the course of this professional development module, we will explore the sensorimotor stage learner characteristics. Each student at the sensorimotor stage of learning has their own unique attributes including interests, experiences, diagnoses, disabilities, and Special Education eligibilities. Our focus will be to better understand how to implement instructional strategies based on our individual learner profiles we develop through data collection.

Where the journey began…

Our team was experiencing challenges with providing meaningful service for our learners with severe disabilities. We felt as we each provided instruction in different ways that we were not seeing the learner outcomes we wanted to see. Our Teacher for Students with Visual Impairments reached out to Millie Smith, a consultant for the American Printing House for the Blind. Millie had authored the Sensory Learning Kit (SLK) Guidebook and Assessment Forms and the SLK Routines Book in 2005. She wanted to revise the guidebook and this time implement a case study approach. This was mutually beneficial for our District and for Millie! Millie trained the Instructional and Related service providers and classroom staff through monthly in person sessions over the next 3 years. The information shared in this Professional Development (PD) module was developed through the case study and training experiences.

Collaboration is KEY!

- ★ This is a student population with multiple areas of educational needs and providing instruction can seem to be challenging.
- ★ Each team member views the learner through a different lens or perspective
- ★ Sharing experiences allows everyone's expertise to be used effectively.

The structure of the module is divided into 4 sections over the key concepts that build on learning throughout the module.

- ★ Identification of the Sensorimotor Stage Learner
- ★ Data Gathering - Assessment & Observation
- ★ Instructional Design
- ★ Goals and Implementation

Resources are embedded within each section to provide you with materials to help develop your understanding of the concepts. You will be introduced to the Sensing and Learning program including

- ★ Sensorimotor Scope and Sequence
  - ○ Including Sensorimotor Exploratory Schemes and Procedures
- ★ Sensorimotor Routine Lesson Plan
- ★ Sample scripted routines and video examples

Also, you will be provided with guided activities that give you the opportunity to practice in order to develop the instructional skills necessary to teach sensorimotor stage learners.

- ★ Pronto Practice! In each section you will be given a practical strategy you can put in place pronto!

    - Supports small changes to your current instructional practice
- ★ Questions to prompt you to look at your current students from a new perspective.
- ★ Student Scenarios provide real-life scenarios that have been worked through by the team and may be similar to situations you experience.
- ★ Practice writing a PLAAFP statement based on the data gathered through observations
- ★ Practice writing an instructional routine lesson plan
- ★ And practice writing goals and benchmark objectives for your sensorimotor stage learners
    - Including resources to support access and progress in the general Physical Education (PE) curriculum

Most IMPORTANTLY - This professional development module is structured to provide you with practical instructional strategies that are research and evidence based so you can provide meaningful instruction for your learners at the sensorimotor stage.

In the next section, we will explore the characteristics of a sensorimotor stage learner so we can identify the learners we have on our caseload that need sensorimotor stage instruction.

Section 2: What is a Sensorimotor Stage Learner?

Learning Objectives:

- Distinguish characteristics of sensorimotor stage learners.
- Demonstrate understanding of Vygotsky's Zones of Proximal Development.
- Analyze opportunities for student engagement with objects, people, and actions.

As APE service providers, we work with a wide range of student learning profiles. Each student profile presents its own challenges when it comes to instruction. As we focus on sensorimotor stage learners, we need to identify who is functioning at this stage of cognitive development. We may not view our role as APE teachers from the cognitive development perspective. However, the complexities of the sensorimotor stage learner requires a global approach. If we don't have an understanding of where our learner is functioning, we may provide activities that are too difficult, or the learner is not able to actively participate in the activities.

Theories provide the basis for understanding the "why" behind research based instructional strategies. It gives us the information so we can answer the question "How do we know what we are doing is effective?" Increasing our understanding strengthens our instructional design which includes providing modified equipment, task analysis, and motor skills practice through repetition.

Follow the link to learn about: Theories: What should we know?

Piaget's Model of Cognitive Development

Our students can be at any stage at any age. An important point to understand is that when we are working with sensorimotor stage learners, we must provide them with the instruction needed at their level so they can continue to progress through the continuum of development. Also, learners may function at the sensorimotor stage of learning in some ways and pre-operational stage in other ways.

Gibson's Ecological Approach to Perceptual Development

Gibson's research provides us with the perspective that "Action systems and sensing systems work together to allow infants to "discover what the world affords and what to do about it." A child without disabilities is able to progress through the sensorimotor stages because they are able to interact with the objects and people in their environment. They may rock, roll, or crawl through their environment and reach, grasp, bat at, or shake objects in their environment. When a learner is not able to engage in their environment, their progress through the sensorimotor stage of learning is impacted. We want to develop learning experiences that include nurturing and sensory rich environments.

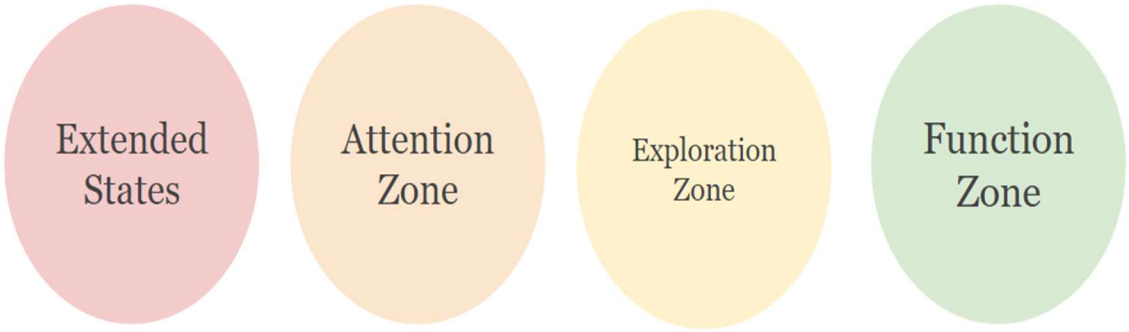
Vygotsky's Zone of Proximal Development

Vygotsky's theory tells us that social interactions with our environment helps to gain higher mental functions. The video describes the Zone of Proximal Development (ZPD). The zone of proximal development "is the space between what one can do alone and what one can do with help. That is where learning occurs." This reminds us that we all are able to expand our knowledge with appropriate levels of support. Instructional strategies and activities within the learner's zone of proximal development means that goals are achievable.

- ★ Sensorimotor stage describes learning of typically infants and toddlers up to two years of age.
- ★ Primary behaviors are attention to and interaction with objects, people, actions, and places.
- ★ Sensorimotor stage learning consists of sensing - using the senses and acting - responding to interesting sensory sources by exploration or manipulation.

What movement and mobility challenges have you observed with your students at the sensorimotor stage of learning?

Sensing and Learning divides sensorimotor stage skills into 3 ZPDs:



Extended States

Precursor to Learning and Engaging in Sensorimotor Stage Learning

- ★ Sleeping - No evident response to sensory events in the environment
- ★ Drowsy - Heavy eyelids, unfocused stare, orients to sensory events for a short amount of time
- ★ Fussy - Mild distress or protesting
- ★ Agitated - Crying, grimacing, tension in body tone, engaging in self-injurious behavior

Learning CANNOT occur in this state.
Students are not READY to learn.

These are our learners who show behaviors of sleeping, or being drowsy, fussy, or agitated. They may be overwhelmed by the environment and are shutting down. These behaviors may be the result of necessary medication or other health and medical issues. They may struggle with self-regulatory behaviors, avoid people or activities, or may just allow physical manipulation. Fussy

and agitated behaviors may be the student's way of communicating disinterest or discomfort. They are not ready for learning. The first step is to recognize and identify when a learner is in an Extended State and how often they spend time in this state throughout their day.

Attention Zone

- ★ Attends to interesting and pleasing sensory attributes of people and objects with increased frequency and duration
- ★ Anticipate the second of two consecutive sensory experiences after the first occurs
- ★ Signals desire for continuation of a desired activity using undifferentiated response

Learners are in a Quiet Alert arousal state. This is the foundational zone for all sensorimotor stage learning. If they are not able to maintain attention with objects, people, and actions, learning does not occur. Attention is a skill! It can be taught and expanded. Many times, we try to provide objects and activities, but our learners are in an extended state and not able to engage. While many of us, as APE service providers, feel we need to do something that gets our students moving we need to consider where our students are functioning. When we think of this in the context of Individual Education Program (IEP) goals and objectives, we want to meet each student where they function and address skill deficits. Especially learners who are making limited progress on goals or that are being provided physical assistance to facilitate engagement in most activities. We can think of attention as a prerequisite skill. Once our learners have increased their skill of maintaining attention, we can expand that skill and build on that skill.

Follow the link to watch a video of a student at the Attention Zone.

Student Scenario:

Typically, we think of the Extended States challenges related to learners who have physical impairments. However, learners who are ambulatory can provide challenges in a different way. Attention can be difficult to address for a learner who is on the move and seeks out bouncing or rocking movement. A Start/Stop activity provides the learner with the opportunity to learn to connect attention to an object with starting and stopping motivating movement.

Jamie was a student who was ambulatory, nonverbal, and liked to rock. Jamie, typically engaged with objects very briefly and did not seem to attend to the object while interacting with the object. Jamie also enjoyed music. Jamie spent most of the day roaming the classroom grabbing objects briefly and walking away. It was a challenge to keep Jamie in one spot for instruction.

The team created an activity that included Jamie sitting with a teacher in a rocking chair. The teacher presented a small stuffed Emoji object. Each time the object was presented music and rocking started. Periodically, the rocking and music was paused and the teacher waited for Jamie to look at the Emoji object. As soon as attention was given, the rocking and music started again. Over time, this transitioned to Jamie looking and reaching for the Emoji object.

This is an example of moving from Extended State to Attention Zone and increasing the skill of attention.

Exploration Zone

- ★ Actively explores interesting people and objects
- ★ Imitates actions of others
- ★ Demonstrates knowledge of what happens next in familiar activities
- ★ Obtains desired objects/reject undesired objects
- ★ Demonstrates understanding of cause and effect

The main function of a sensorimotor stage learner. The learner is able to maintain attention and seek out desirable objects and people. Learners in the Exploration Zone are now ready to explore and manipulate objects. These learners begin to be able to imitate the actions of others. They begin to use a variety of techniques to engage with objects. These exploration skills can be explicitly taught and developed so the learner increases their engagement with the environment in a wide variety of ways. We can expand their ability to explore in a variety of environments. Our sensorimotor stage learner at the Exploration Zones begins to show understanding of what comes next in consistent familiar activities and demonstrates an understanding of cause and effect.

It's important to understand exploration is CRITICAL for learning for our sensorimotor stage learners. We may feel we need to rush through this zone because we are not seeing those independent motor movements. Exploration skills are more mental than motor. We must allow our learners the proper time to experience and develop exploration skills. Even students who have limited abilities for independent movement are learning through this process. It's more important for our learners to understand how to initiate and have the desire for exploration than executing the movement independently. For our sensorimotor stage learners, learning occurs during the initiation of the movement. We are TEACHING when we provide our learners with the appropriate instructional environment, activity, objects, time, and facilitation of exploration. These skills can be built upon later.

Follow the link to watch a video of a student at the Exploration Zone.

Function Zone

- ★ Imitates functional use of objects
- ★ Requests help
- ★ Tries to overcome barriers
- ★ Identifies a named person or object in a consistent activity (receptive language understanding)
- ★ Makes choices through looking, pointing, touching
- ★ Demonstrates knowledge of the appropriate function of an object

Sensorimotor stage learners in this zone are now able to maintain attention and are able to initiate and engage in exploration either independently or with support. These learners are now able to understand the purpose of objects and demonstrate that understanding. These learners may continue a movement such as batting a suspended object when prompting is paused. They are able to request help when they are unsuccessful in an action. Sensorimotor stage learners in the Function Zone are now able to make choices and we know they are choosing the object or activity they truly want because they demonstrate the appropriate function with the object. Another important skill the sensorimotor stage learner is able to demonstrate is understanding of verbal language. We have a concrete understanding that the learner knows the named person or object. These language understanding skills are developed through exploration and then continued to be refined as the learner has more experiences with the object in familiar activities.

As you think of your current students, are you able to identify their ZPD? Write about one student and indicators of their ZPD:

Are your students participating in activities within or outside of their ZPD? Describe one student's characteristics, ZPD, and activity.

How often do your students have a chance to engage with objects, people, and actions? Describe

the engagement of one student with objects, people, and actions:

Pronto Practice!

Using Tactile Strategies with Students Who Are Blind and Have Severe Disabilities

Please complete the Section 2 Quiz: Section 2 Identification Quiz

Section 3: How do we create a Present Level of Academic Achievement and Functional Performance (PLAAFP) statement?

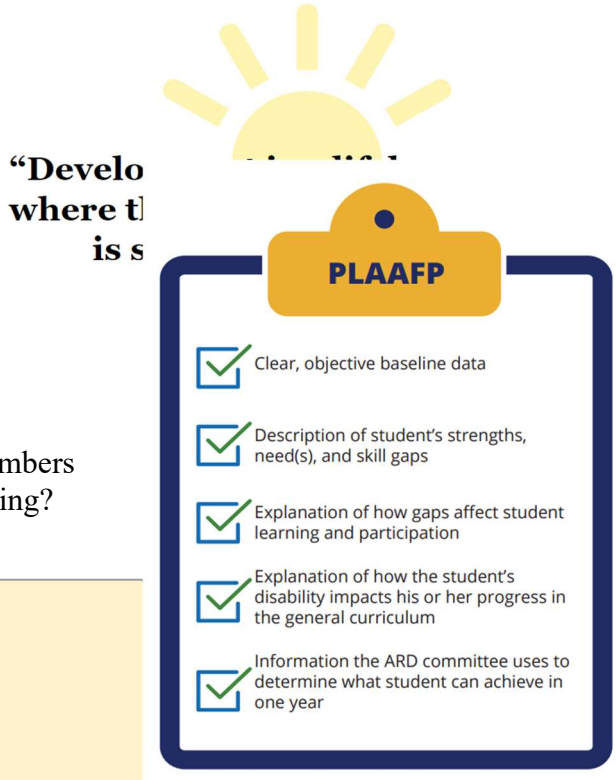
Learning Objectives:

- Evaluate your role as a collaborative instructional team member.
- Demonstrate your understanding of the process of developing a PLAAFP for a sensorimotor stage learner.

The Present Level of Academic Achievement and Functional Performance (PLAAFP) statement is important because it provides information about how the student's disability affects their involvement and progression in the general education curriculum. The PLAAFP statement must include both academic and nonacademic areas of need. Student Individual Education Program (IEP) goals and objectives are developed based on the information included in the PLAAFP statement, so it is imperative that the PLAAFP statement provides an accurate description of the student.

Whether it's gathering data for an initial evaluation, re-evaluation, preparing for an Admission, Review, and Dismissal (ARD)/IEP meeting, or needing to expand current goals/objectives, assessment for sensorimotor stage learners is going to require data gathering through informal assessment. While we have assessment tools as APE teachers that can be used to gather data, many of these assessment tools may not provide the information specifically needed about sensorimotor stage learners' abilities. Formal, standardized assessments are appropriate for assessing skills and are based on typical development with children without disabilities or impairments. For example, the Test of Gross Motor Development III (TGMD III) is appropriate for assessing skills for children ages 3 to 10 years of age and must be completed adhering to the strict administration guidelines. This assessment is not going to be beneficial for our sensorimotor stage learners who are demonstrating skills of children birth to 2 years of age. Informal, criterion referenced assessments, such as the Southern California Ordinal Scales of Development, are more appropriate evaluations for our sensorimotor stage learners. Informal assessments provide more flexibility during administration and gather information about the skills the student is able to perform.

Rather than focus on the specific tools, we are going to discuss the types of information that will need to be gathered. Also, as we go through this information, we want to remember this can be a team project! Collaborate with other service providers to get the best picture of the learner. When possible, video recordings can be shared and reviewed as a team.



What Instructional and Related staff team members could you collaborate with during data gathering?

Plan - Daily Schedule

- ★ This is information we can gather from the classroom teacher, paraprofessionals, and general PE teacher.
- ★ Good times during the day for observation that the learner is alert and ready for learning.
- ★ This can be during a favorite activity or just an alert time during the day.

- ★ It's also good to observe times of the day that the learner may not be in an alert state. Look at learner behavior and what the learner looks like in the various arousal states.
- ★ Also, document or ask for the teacher to document the Learner-Staff Ratio. This information will be helpful during implementation.

Observe - In activities!

- ★ Document general information such as date and time.
- ★ Using the learner's Daily Schedule try to find a variety of days to observe.
- ★ We want to document what Response Zone our learner is demonstrating:
  - ○ Extended State
  - ○ Attention Zone
  - ○ Exploration Zone
  - ○ Function Zone
- ★ Our learners can demonstrate different zones within the observation.

New Terminology:

- ★ Learning Media - refers to the materials used for instruction

- People, objects, actions, and places
- Experienced daily
- Become highly motivating "topics"

★ Conditions - refers to the environmental factors, media attributes, or other circumstances that can affect sensorimotor stage learners
- Can be barriers to sensory efficiency
- Can be accommodations and supports
- Can be positioning and prompting

Next, we want to describe the **response behavior**:

Extended State → fussy, sleeping, agitated

Example of Extended State Response: When the teacher uses lots of verbal language and random touching while presenting a yellow ball, the learner begins biting their hand.

Attention Zone → changes in behavior and demeanor

What does this look like?

★ Do they begin to vocalize or maybe stop vocalizing
★ Do they move their eyes or body in the direction of the activity
★ Do they tense and tighten or maybe relax
★ Maybe they smile or frown or laugh
★ Notate any changes with specific details
★ Video comes in handy!

Example of Attention Zone Response: A learner seems interested in a yellow ball and looks at it for 3 seconds.

Review the Attention Zone and Exploration Zone videos as a model for gathering data for learners.

Describe your role and how you can contribute to the data gathering process:

Identify and describe the opportunities you have within your typical day to observe a sensorimotor stage learner:

Exploration Zone:

We want to describe how the learner is engaging with their environment. What movements is the learner using to interact with the object? We can use Sensorimotor Exploratory Schemes and Procedures to describe these movements. We also want to document what body parts are being used.

What does this look like?

- ★ Do they initiate movement to an interesting object?
- ★ Do they extend their hands or fingers?
- ★ Do they move their whole body?
- ★ Do they reach out with their foot?

Example of Exploration Zone Response: A learner reaches for a yellow ball suspended within arm's length. The learner moves their whole arm in an attempt to make contact with the ball.

Sensorimotor stage learners need to explore objects and experience movement through many actions. The sensorimotor exploratory schemes and procedures provides us with the foundational actions that need to be experienced to support cognitive development.

Sensorimotor Exploratory Schemes and Procedures

Schemes Actions performed to probe multisensory attributes of objects	**Procedures** Actions performed to probe tactual attributes of objects
Mouthing	Lateral Movement
Scratching	Pressure
Raking	Static Touch
Grasping	Unsupported Holding
Banging	Enclosure
Shaking	Contour Following
Dropping	

Schemes Actions performed to probe multisensory attributes of objects	**Procedures** Actions performed to probe tactual attributes of objects
Throwing Pulling Out Putting In Take Apart Put together	

Student Scenario:

Amani was very active and able to manipulate objects. However, each time an object was presented Amani grabbed the object briefly and dropped it away from their body. Amani's parents shared that Amani really loved cardboard boxes. As soon as Amani was given a box and an object, Amani started banging, shaking, putting in, and taking out. The key was the motivation!

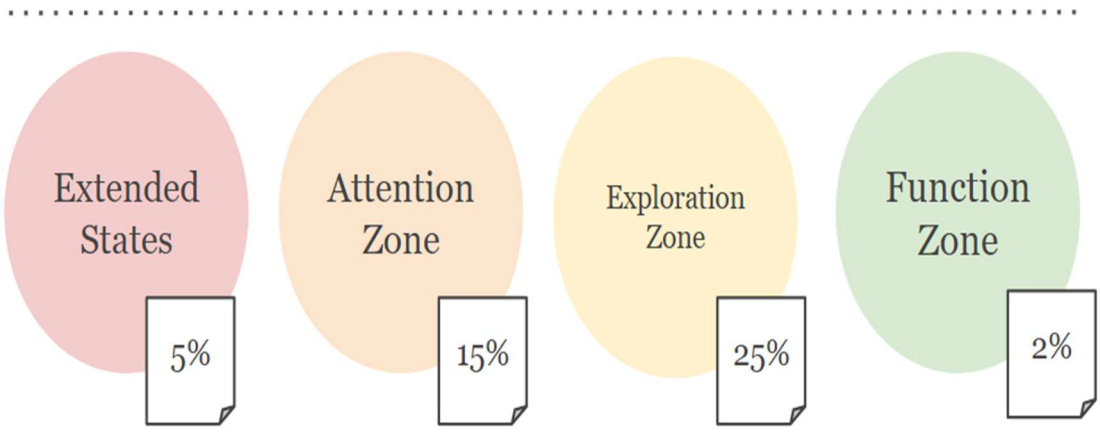
Finding the right motivation objects and people can be the difference in observing what the learner can do…Or not!

Function Zone: In our observations we will describe the movement and how the learner is demonstrating the attempt to use the object functionally.

Example of a function zone response: When the learner sees a yellow ball, they open their fingers in anticipation of grasping the ball. The teacher places the yellow ball in the learner's hand and the learner grasps the ball and the teacher supports the hand at the wrist to release the ball into a container.

Interpret - Organize the Data

- ★ We are going to take our observational data and organize it to give us a total of responses in each Zone. The Zone with the highest percentage is the learners Zone of Proximal Development.
    - **This is their instructional level**
    - When we develop a PLAAFP statement and Goals/Objectives, this is how we describe the learner's skill level.



Take some time to explore the Sensorimotor Stage Scope and Sequence

The Sensorimotor Stage Scope and Sequence provides the framework of learning for each zone. Learners need to develop the skills in each level and in each domain as they progress through the scope and sequence.

PLAAFP Development:

ZPD +	Highly Motivating Topic +	Environment & Positioning +	Duration & Trials +	Exploratory Schemes and Procedures +	Scope and Sequence =

PLAAFP: We now have information to describe the student's skills.

- ★ Using the Sensorimotor Stage Scope and Sequence we can describe the student's skill level in each Zone of Proximal Development
- ★ We can describe the environment and positioning the learner is most successful
- ★ We have collected data that describe how long the learner can engage in activities and how many times they are able to perform a specific skill
- ★ We can describe the Exploratory Schemes that are being performed with particular objects
- ★ We have more concrete data to create goals and objectives!

Present Level of Academic Achievement and Functional Performance

Think of a student you currently provide services for and develop a PLAAFP statement using the observational data gathering and data interpreting process shared in the module.

Please complete the Section 3 Quiz: Section 3 Data Gathering Quiz

Section 4: How do we TEACH our Sensorimotor Stage learners?

Learning Objectives:

- Distinguish the key characteristics of the instructional strategy: "Routine."
- Demonstrate your ability to script an instructional routine using the Sensorimotor Routine Lesson Plan.

Collaboration: Bringing our Perspective to the Table
As Instructional Service Providers, we bring many skills to the collaboration table including understanding of motor development, knowledge of academic standards, and experiences with instructional methods. We can bring our perspective to the collaboration table, in the following ways:

★ End in Mind → Based on learner interest and motivation, what types of activities could be accessible in the future?

- Special Olympics Fundamentals
- No Limits Games
- Family Recreation and Leisure Activities
- Daily Living Activities
- Community Activities - Aquatics and Fitness

★ Exploratory Schemes and Procedures → What activities can we create that are more than repetitions of motor movements?

- Prerequisite movements to more complex motor skills

Follow the link to see Adam participate in a routine focused on the sensorimotor exploratory schemes.

- ★ Task Analysis → How can we analyze the task to support learner engagement?
    - Setting up the learner for success → modified equipment
    - Appropriate prompting (conditions)
    - Wait time!!!
- ★ Setting up various environments → How can we adapt the environment to encourage active participation?
    - Quiet environment
    - Attention to lighting in the environment
    - Supported positioning
- ★ Thinking Outside of the Box!!!

What experiences, content knowledge, and pedagogy knowledge do you bring to the collaboration table?

Sensing and Learning provides instruction through using the research based strategy called **"Routines"**:

- ★ An attractive and consistent context in which the learner practices specific cognitive, communication, and motor skills
- ★ Written from the learner's point of view
    - Based on current skills (PLAAFP), each step is what the learner is able to do (learner responsibility)
    - Initiate VS Execution - The learner will be expected to perform at their ZPD.
    - What will the learner do with the help of a learning partner?
    - Clear expectations of learner participation.

- ★ Consistent, systematic direct instruction
  - Active cognitive participation creates COHERENCE!
  - Manipulation by another person without understanding does not!

Instruction is more effective when it is:

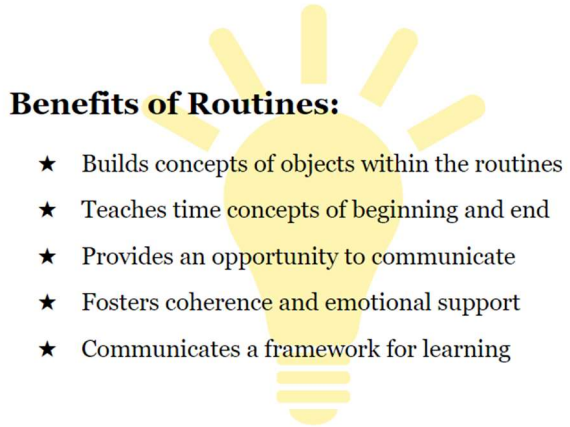
Focused on a small number of priority skills

Regular practice in activities that occur several times daily

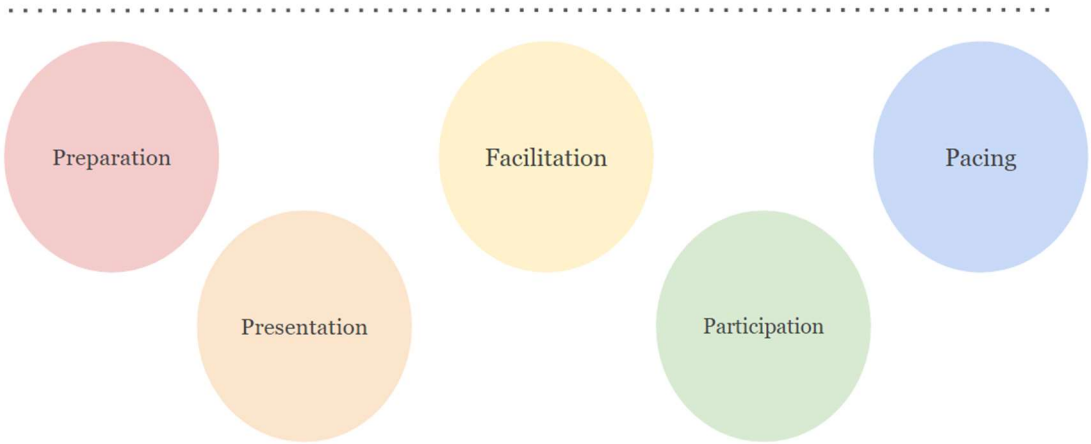
Appropriately addresses skills in the ZPD

Natural environment instruction

Consistent, same structure every time



Accommodations: The supports provided to the learner to access learning.



Preparation

- ★ Vocal greetings before touch
- ★ Use supports for comfort and stability
- ★ Position for simultaneous touch and visual attention

Presentation of Objects

- ★ Distance sense introduction (sound first, then vision) before touch
- ★ Sequential multisensory exposure

- ★ Pairing procedure (look and touch, listen and touch)
- ★ Reduce auditory complexity → NO talking!

Facilitation of Exploration

- ★ Visual access to hands
- ★ Touch cue on arm before using hand touch
- ★ Hand-under-hand guidance
- ★ Tactual modeling

Participation Supports

- ★ Visual modeling
- ★ Tactual modeling
- ★ Visual and tactual modeling
- ★ Hand-under-hand guidance
- ★ Wrist assist
- ★ Elbow assist
- ★ Shoulder assist
- ★ Head and trunk alignment and stabilization

Pacing

- ★ Extended presentation durations
- ★ Extended wait time for responses
- ★ Provide a break
- ★ Provide more help when health issues are a factor
- ★ Integrate a routine
    - ○ When the pacing of instruction within group activities is too fast, choose a portion of the activity and structure it as a routine.

Think of a learner and describe the accommodations that would support their participation in a

routine or activity:

Sensorimotor Routine Lesson Plan

- ★ The information included in the Sensorimotor Routine Lesson Plan describes and documents the delivery of services described in the IEP.
- ★ Routines should be created to focus on skills within the appropriate Zone of Proximal Development.
- ★ The routines should include highly motivating objects.
- ★ Goals are embedded within the routine → however, a goal should not be included in every step of the routine.
- ★ A goal can be embedded in multiple steps in the routine.
- ★ If the routine requires a step that is important but above the learner's response zone, notate "Exposure" in the Embedded Goals column.
    - ○ This alerts the teaching partner to provide more support.

After watching the video of Aarna during her "Bells Routine," practice completing the Sensorimotor Routine Lesson Plan for her routine:

Sensorimotor Routine Lesson Plan

Learner		**Location**	
Instruction Zone		**Time**	
Teaching partner		**Position**	
Observing team members		**Testing Period**	
Observation Frequency		**Data Period**	

Learner's Steps	**Accommodations and Supports**	**Embedded Goals:**	**Documentation**
1.			
2.			
3.			
4.			
5.			

6.			

Sensorimotor Routine: Embedded Skills
Sample Lesson Plan

Student		**Materials**	Bell on wrist band
Routine	"Move" OR "Bell" Routine	**Position**	Supine on a wedge
Teaching partner	Classroom Teacher	**Frequency**	Daily (1-2 times per week)
Observing team members	TVI; PT; OT; APE	**Duration**	10 min
Location	Home OR Special Education Classroom	**Testing period**	2 weeks

Learner's Steps	**Partner's Supports and Accommodations**	**Embedded Skills: Exploration**	**Documentation**
1. Look, Listen, and touch object symbol	", let's play Move". Allow to look at and touch object in the box.	Look at and touch object symbol in anticipation of routine.	
2. Listen to body part names and feel body parts being moved by the teacher.	", move (right) hand" Move hand for her. "Put on hand" Put the object on hand. Repeat with left hand, left knee, left foot, and right foot. Head only if using bells.		

Learner's Steps	**Partner's Supports and Accommodations**	**Embedded Skills: Exploration**	**Documentation**
3. Listen, feel and move.	"It's your turn , move (right) hand". Wait for response. If no response after ~10 seconds, touch the body part and say "move _____". If no response after ~10 more seconds say, "I'll help you, let's move_____" and move body part. "Put on hand" Put the object on hand. Repeat for all remaining body parts.	Participate in reciprocal activity.	
4. Request and move.	"Now where?" Touch hands, knees, and feet. When moves a body part, put the item immediately on the body. "I saw you move _____, put on _____"	Request by moving desired body part.	
5. Anticipate cessation of routine.	"Move is finished." Put the item in the finished box.	Anticipate cessation of routine.	

Pronto Practice!

Tactile Modeling

Please complete the Session 4 Quiz: Session 4 Instructional Design

Session 5: How do we write GOALS for our Sensorimotor Stage learners?

Learning Objectives:

- Identify key components included in goals and benchmarks
- Demonstrate your ability to write an annual goal and benchmark objectives for a sensorimotor stage learner.
- Describe Adapted PE service providers opportunities for supporting routine implementation.

In our previous sections, we have learned to identify the sensorimotor stage learner and determine the learner's ZPD. Next, we discussed strategies for gathering information about our learner through observation and informal assessment. We gathered information about what learning media they were interested in and what conditions were present when they were interacting with the media. We used all this information to create a PLAAFP statement that included specific information such as the positioning and prompting needed and the context of the activity - in the special education classroom or in the general education environment. During our observations, we measured how long the sensorimotor stage learner could engage in the activity or how many times they performed the skill. Using our Sensorimotor Scope and Sequence, we chose the skills to focus on and planned our instruction through the Sensorimotor Routine Lesson Plan. All of this information will now be used to write our goals and benchmark objectives that will be included in the learners IEP.

The process is similar to any student with an IEP. An important consideration is that as with all processes with our sensorimotor stage learners this should be a team process and the goals and objectives should be integrated within the learners IEP. What does this mean? It means functional and developmental goals and objectives address the priority educational needs of the learner. As we discussed previously, trying to address skills that are outside of the learner's ZPD does not support learning. Our sensorimotor stage learners are working on skills developed between birth and two years of age. This means standard based goals without individualization are not appropriate. Goals can be included in the context of accessing the general education curriculum, but skill development goals must be individualized to the sensorimotor stage learner.

Goals and Benchmarks

Timeframe	Skill	Conditions	Measurement Criteria	Benchmarks
By the end of the 2nd grading period	Reach for a desired object	After: Tactual modeling	7 out of 10 trials	3 out of 10 by second progress report
Within six weeks		Where: In an integrated routine		5 out of 10 by third progress report
		How: By initiating reach toward an object		

The timeframe for mastery of the goals and benchmark objectives is guided by your current District or Charter. Our evaluations and the Sensorimotor Scope and Sequence guides our skill focus that is individualized to the learner. Conditions are the accommodations for our learners to be able to access their routine. Measurement criteria and benchmarks are guided by the information we established in our PLAAFP. We want to be aware of our learner's rate of acquisition and history of attendance. Another consideration is if we want to address the Frequency or Duration of skill performance. We want to consider what our learner needs. Thinking back to Adam's "Play Routine," Adam needed to extend his time of engagement with objects rather than attempts. We want to set reasonably high expectations for our learner to accomplish the goals. When using the research-based strategy of routines and implementing the routines at the appropriate ZPD our learners will learn!

The Sensing and Learning program has framed Conditions into When, After, Where, and How. The following are some examples that could be considered for our sensorimotor stage learners. These would be developed individually for each learner. Many of these are evidence-based practices that are considered to be highly effective ways to provide instruction.

Conditions:
With including conditions, we now have a consistent performance expectation, and this helps the instructional team to all be able to measure performance for data collection.

When - These conditions must be present and ongoing during the routine.

- ★ Positioned for best simultaneous or quickly sequential manual and visual access to objects
- ★ Given a touch cue

- ★ Given hand-under-hand guidance
- ★ Given supports for stabilization of the body
- ★ Given minimal support at the wrist

Follow the link to see Hand-Under-Hand Guidance in action.

After - These conditions need to happen at the beginning of the routine before our learners are expected to perform a skill.

- ★ A procedure to relax and open the hand
- ★ Tactual modeling
- ★ Visual modeling
- ★ A procedure to relax and extend arms

Follow the link to see Tactual Modeling in action.

Where - This specifically describes the environment

- ★ In a one-on-one, direct-teach routine
- ★ In an integrated routine
- ★ In an activity designed for typical peers
- ★ In an adapted play or leisure setting

How - These conditions describe exactly how the learner is going to demonstrate the skill.

- ★ By changing movement patterns
- ★ By opening the eyes
- ★ By vocalizing

- ★ By extending some part of the body in an attempt to obtain an object
- ★ By looking at an object to indicate a desire to obtain it
- ★ By initiating some motion associated with the use of an object

Additional Resources:

- ★ Project SALUTE
- ★ Hand Under Hand Video
- ★ Hand Under Hand Handout: Things You Might Want to Know
- ★ Hand Under Hand Resource
- ★ Hand Under Hand Technique Practice Guide

Describe a current learner's conditions needed to participate in a routine:

Standards-Based Annual Goals and Accessing Grade-Level Content Standards

We have discussed the process for developing individualized goals and objectives for our sensorimotor stage learners based on their ZPD. The skills addressed are functional skills that are typically demonstrated prior to a kindergarten level. The Individual with Disabilities Education Act and the Every Student Succeeds Act require students with disabilities to be included in statewide assessments and must have access to the general education curriculum.

How do we connect our sensorimotor stage learner's functional skill level to our enrolled grade-level content standards?

Using the process we have previously discussed to develop goals and objectives individualized to the sensorimotor stage learner's:

- ★ Zone of Proximal Development (Attention, Exploration, Function)
- ★ Learning Media - Motivating "topic"
- ★ Conditions for Interaction - Environmental factors, media attributes, accommodations, supports, positioning, and prompting
- ★ Sensorimotor Scope and Sequence - Priority Skills based on task analysis

We will now align this information to the most appropriate grade level standard. We must connect to the most appropriate developmental standard keeping in mind the skills that represent the student's ZPD. For example, an elementary student at the Attention level is working on functional skills including visually tracking, moving their bodies in various ways (rolling, creeping), and participating in activities to enhance learning of specified motor development skills. These students should not be expected to engage in skills such as cross lateralization and sequencing of two skills because they have not demonstrated developmental baseline skills at that level.

An example of an elementary student at the Exploration level initiating movement of their hand or feet toward an object with intent is working on the prerequisite functional skills of tapping a ball with the inside of their foot or dribbling with one hand. This student should not be expected to kick the ball because that is a skill at the Function level. A sensorimotor stage learner at the Function level could have a goal connected to the content standard of kicking because they have an understanding of the function of the object (the ball) and more experience with object permanence (the ball is still available when it is away from their body or out of sight).

The process of writing a standard-based goal can be challenging and overwhelming. The PE Curriculum Connection has been developed to provide APE service providers with guidelines for each level of the sensorimotor stage learners' ZPD.

Additional resources include:

Technical Assistance: Individualized Education Program

Texas Essential Knowledge and Skills for Physical Education

Practice writing a goal for a current learner:

What is our APE provider role?

- ★ Routine Observation
- ★ Video Review
- ★ Schedule time for feedback
- ★ Help script routines
- ★ Suggest adjustments to routines when the learner seems less motivated to engage
- ★ Make suggestions for additional routines based on learner interest
- ★ Create an "integrated" routine to be used in a general education environment
- ★ Primary implementation partner OR transition partner

Describe how you will support routine implementation:

Routine Implementation

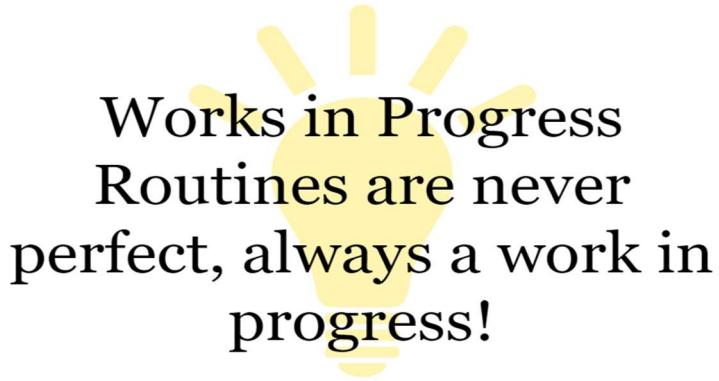
Question/Zone	Attention	Exploration	Function
About how many steps are in a routine?	5 steps	10 steps	15+ steps
About how long does the routine last?	5 minutes	10 minutes	15+ minutes
About how many goals should a routine address	1-3 goals	2-4 goals	3-5 goals
About how many times a day should a learner do the same routine?	3-6 times	2 times	1 tems

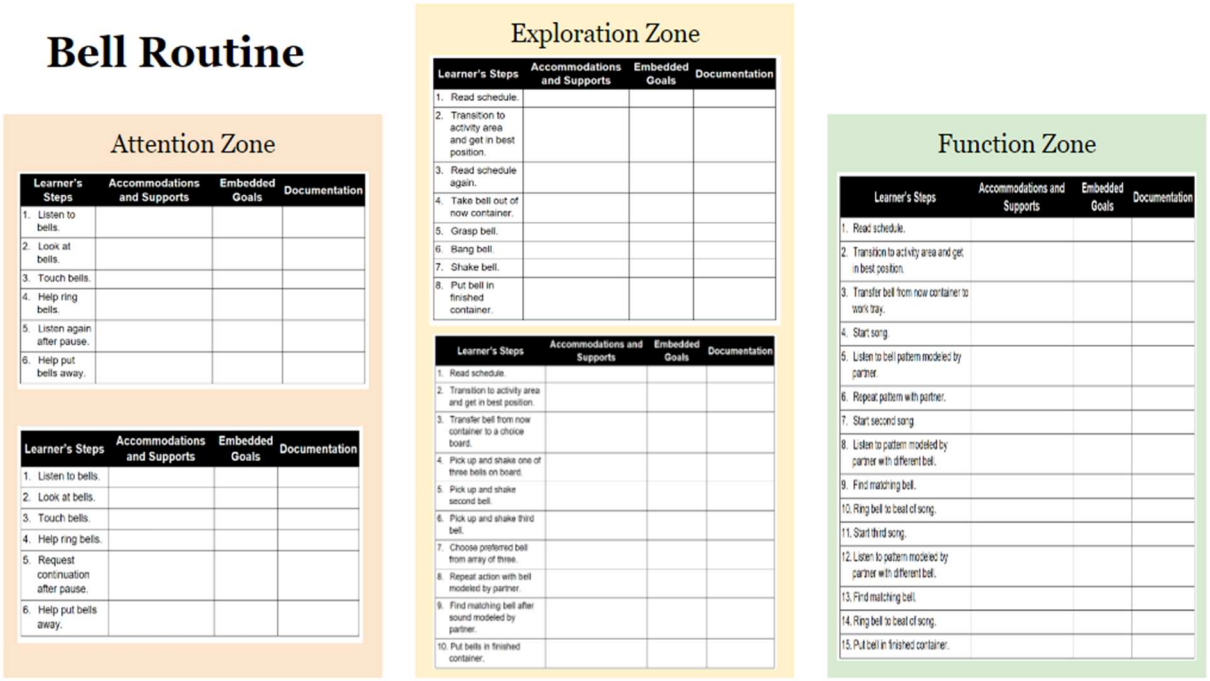
Routines must be individualized. However, routines can be expanded as the learner transitions or "graduates" from each stage of learning. You can use the same "topic" as long as it is highly motivating to the learner.

When learners are less motivated by the topic, you may need to create a new routine with similar targeted skills and embedded goals but with a new highly motivating topic.

Final Thought!

Routines can always be expanded. New routines can be developed to teach new skills. Learners move from zone to zone with new needs and interests.





Bell Routine

Attention Zone

Learner's Steps	Accommodations and Supports	Embedded Goals	Documentation
1. Listen to bells.			
2. Look at bells.			
3. Touch bells.			
4. Help ring bells.			
5. Listen again after pause.			
6. Help put bells away.			

Learner's Steps	Accommodations and Supports	Embedded Goals	Documentation
1. Listen to bells.			
2. Look at bells.			
3. Touch bells.			
4. Help ring bells.			
5. Request continuation after pause.			
6. Help put bells away.			

Exploration Zone

Learner's Steps	Accommodations and Supports	Embedded Goals	Documentation
1. Read schedule.			
2. Transition to activity area and get in best position.			
3. Read schedule again.			
4. Take bell out of now container.			
5. Grasp bell.			
6. Bang bell.			
7. Shake bell.			
8. Put bell in finished container.			

Learner's Steps	Accommodations and Supports	Embedded Goals	Documentation
1. Read schedule.			
2. Transition to activity area and get in best position.			
3. Transfer bell from now container to a choice board.			
4. Pick up and shake one of three bells on board.			
5. Pick up and shake second bell.			
6. Pick up and shake third bell.			
7. Choose preferred bell from array of three.			
8. Repeat action with bell modeled by partner.			
9. Find matching bell after sound modeled by partner.			
10. Put bells in finished container.			

Function Zone

Learner's Steps	Accommodations and Supports	Embedded Goals	Documentation
1. Read schedule.			
2. Transition to activity area and get in best position.			
3. Transfer bell from now container to work tray.			
4. Start song.			
5. Listen to bell pattern modeled by partner.			
6. Repeat pattern with partner.			
7. Start second song.			
8. Listen to pattern modeled by partner with different bell.			
9. Find matching bell.			
10. Ring bell to beat of song.			
11. Start third song.			
12. Listen to pattern modeled by partner with different bell.			
13. Find matching bell.			
14. Ring bell to beat of song.			
15. Put bell in finished container.			

Describe areas of knowledge you have gained through this professional development

What questions do you have?

Pronto Practice!

Touch Cues Fact Sheet

Please complete the Session 5 Quiz: Session 5 Goals and Implementation

Thank you!

You have completed the professional development module portion of the study. Please click on the link below to complete the posttest questionnaire. After completion of the Posttest Questionnaire, you will receive a Certification of Completion to provide to your supervisor for Continuing Professional Education (CPE) credit consideration.

Posttest Questionnaire

References and Resources

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Appendix I

Interview Protocol

Researcher Introduction:

Hi, I am Angela Campbell. I am conducting this study in the pursuit of securing my Doctor of Education (EdD) in Special Education. I have been in the field of Special Education and Adapted Physical Education as a teacher and intend to generate new information that will be beneficial to the field of Adapted PE. A reminder There are two purposes of this investigation. The first purpose of the study is to examine the APE service providers perceptions related to providing APE services for students with severe disabilities at the sensorimotor stage of learning. Secondly, the self-reported use of instructional practices and strategies before and after a self-paced asynchronous professional development learning module will be examined to determine the extent of alignment with research-based strategies and evidence-based practices recommended in the research literature. The follow-up interview is to examine the current highly effective instructional strategies utilized by APE teachers currently in the field. The interview will give you a chance to share your thoughts about the professional development module. There are no right or wrong answers to the questions.

The interview should be completed in about 30 minutes. I may take notes during the interview but will keep that to a minimum. Also, the interview will be recorded. After the interview, a follow-up email will be sent with a description of the interview. This description is not meant to be a transcription of the interview. You will have the opportunity to check the accuracy of the description and provide any comments or feedback.

Do you have any questions before we start the interview?

Opening Question:
How would you describe your typical day as an Adapted PE teacher?

Content Questions:

1. What strategies do you typically use when working with students with severe disabilities at the sensorimotor stage of learning?
2. What instructional strategy changes when working with students with severe disabilities at the sensorimotor stage of learning have you made after participating in the professional development module?
3. How has your level of confidence about working with students with severe disabilities at the sensorimotor stage of learning changed after participating in the professional development learning opportunity?
4. How have your perceptions of students with severe disabilities at the sensorimotor stage of learning changed after participation in the study?
5. What thoughts or comments would you like to share about the professional development learning opportunity?

Do you have any additional questions or comments you would like to share?

Closing:
Thank you for taking the time to complete the questionnaires, professional development learning opportunity, and the interview. Interview data will be used to add rich descriptive data and will not include personally identifying information. The recordings, notes, and follow-up emailed description will be stored on a password protected device and will be destroyed by May 2026.

Appendix J

Adapted Physical Education Service Providers Perceptions of Sensorimotor Stage Learners' Service Provision (PSP) Posttest

General Instruction

This questionnaire is an investigation that tries to discover the perceptions and challenges of adapted physical education service providers related to providing APE services for sensorimotor stage learners. There are no right or wrong answers. When given multiple options, please check all that apply.

Many of the questions on this questionnaire use a rating scale of 7 points. Please check the number that corresponds best with your beliefs and opinions. For example, if you fully and completely understand these instructions, put a CIRCLE on the DEFINITELY YES as shown below.

DEFINITELY NO : 1 : 2 : 3 : 4 : 5 : 6 : 7 : DEFINITELY YES

Sensorimotor Stage Learner
Consider the possibility of having a Sensorimotor Stage Learner on your caseload.

Study Terminology:
Severe disability: Refers to individuals with multiple impairments, including cognitive, visual, hearing, orthopedic, and communication impairments with medical complications who demonstrate limited environmental awareness and voluntary movement (Jansma, 1999; Vogler et al., 2000; Sherrill, 2014).

Sensorimotor stage of learning: The earliest stage (birth to 2 years) in Jean Piaget's theory of cognitive development, when learning occurs through a child's sensory and motor interactions with their physical environment.

Providing APE Service for a Students Like Taylor and Alex
Taylor has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Taylor utilizes a wheelchair and is dependent on others for both pushing the wheelchair and transitions into and out of the wheelchair. Taylor is not able to follow verbal directions. Taylor can reach and grasp objects. However, it takes an extended amount of time for movement. Taylor sleeps during the day and can be fussy. Taylor does not seem to engage with classmates. When given an object, Taylor may drop the object away. Taylor allows physical manipulation of the arms, hands, legs, and feet by adults during activities.

Alex has a severe cognitive disability and has a visual impairment, hearing impairment, and health-related challenges. Alex is ambulatory and wears ankle-foot orthoses and a scoliosis brace. Alex typically walks at a reduced pace with stand by support for safety. Alex can transition from standing to sitting and sitting to standing with support. Alex can manipulate

objects by grasping, releasing, banging, swiping, dropping, and is beginning to toss objects in an intended direction for a short distance. Alex can reach for a floating balloon and pull the balloon to his body in an attempt to catch. Alex enjoys looking at and interacting with familiar adults and peers. Alex will protest when not feeling well or not interested in an activity. Alex can make choices and communicate wants with pictures and an Augmented and Alternative Communication (AAC) device.

1. Have you ever provided APE services for students similar to Taylor and Alex?
   Yes ___ No ___

2. If yes, how similar are the students you have provided APE services to Taylor and Alex?
   No experience ___ Not at all Similar ___ Somewhat ___ Similar ___ Very Similar ___

Now, please respond to each question about sensorimotor stage learners below using the 7 point rating scale provided.

- Please think carefully about which part of the 7 point scale best describes your beliefs and perceptions.
- Please be sure you answer all items-please do not omit any.
- Please never put more than one check mark on a single item.
- All responses will be kept anonymous.

Please share your attitude toward providing APE services for students like Taylor and Alex.

Providing APE services for students like Taylor and Alex would be:

1. Extremely harmful : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Extremely beneficial
2. Extremely bad : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Extremely good
3. Extremely worthless : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Extremely useful

Please share your perceptions of what others think about APE service provision for students like Taylor and Alex.

4. Most people who are important to me think that I should include students like Taylor and Alex on my caseload.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

5. It is expected that I provide APE services to students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

6. I feel under social pressure to provide APE services to students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perception of your ability to provide APE services for students like Taylor and Alex.

7. I am confident in my ability to provide APE services for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

8. I am confident in my ability to develop a Present Level of Academic Achievement and Functional Performance statement for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

9. I am confident in my ability to develop measurable annual goals and benchmark objectives for students like Taylor and Alex.

   Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

10. For me to provide APE services to students like Taylor and Alex would be extremely difficult.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

11. In general, I can provide accommodations for students like Taylor and Alex.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

12. Whether I provide APE services effectively for students like Taylor and Alex or not is mostly up to me.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your beliefs about providing APE services for students like Taylor and Alex.

13. Students like Taylor and Alex who are provided APE services would be required to participate in activities that are inappropriate for Taylor and Alex's abilities.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

14. Requiring Taylor and Alex to participate in activities would be inappropriate for Taylor and Alex's abilities.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

15. Providing APE services for students like Taylor and Alex would provide students like Taylor and Alex with a better opportunity to learn.

    Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

16. Increasing opportunities to learn for students like Taylor and Alex would be valuable.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

17. Providing APE services for students like Taylor and Alex would be safe for Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perceptions of expectations of others for APE service provision for students like Taylor and Alex.

18. Most parents of students with disabilities think that I should provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

19. Generally speaking, I would do what most parents of students with disabilities think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

20. Most organizations (TAPHERD, APENS) supporting people with disabilities think that I should provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

21. Generally speaking, I would do what most organizations supporting people with disabilities think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

22. Most adapted physical educators think that I should provide APE service for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

23. Generally speaking, I would do what other adapted physical educators think I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

24. My school administrator thinks that I should provide APE service for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

25. Generally speaking, I would do what my school administrator thinks I should do.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your perceptions of external factors when providing APE services for students like Taylor and Alex.

26. I have paraprofessional support when I provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

27. Limited paraprofessional support when providing APE services for a student like Taylor and Alex makes providing APE services for students like Taylor and Alex more difficult.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

28. I have appropriate equipment for students like Taylor and Alex available.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

29. Limited appropriate equipment available makes providing APE service for students like Taylor and Alex impossible.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

30. There are materials and programs available to help me provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

31. Having access to materials and programs available would make providing APE services for students like Taylor and Alex easier.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

32. Various in-service programs related to adapted physical education provided in my district.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

33. Having access to various in-service programs related to adapted physical education would make providing APE services for students like Taylor and Alex easier.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

34. Usually, people have a prejudice against students like Taylor and Alex, and believe these students cannot learn and do well.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

35. Having limited professional knowledge to provide APE services makes providing APE services for students like Taylor and Alex more difficult.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

36. There are administrative supports to provide APE services for students like Taylor and Alex in my district/charter.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

37. Having limited administrative supports to teach students like Taylor and Alex in my district/charter makes providing APE services for students like Taylor and Alex impossible.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Please share your intentions to provide APE services for students like Taylor and Alex.

38. I intend to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

39. I will try to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

40. I am determined to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

41. I plan to provide APE services for students like Taylor and Alex.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

Adapted Physical Education Service Provision Perceptions

42. How many students like Taylor and Alex have you provided APE services for in the past 3 years?

Approximately _____ Number of students like Taylor and Alex

43. If you have provided APE services for students like Taylor and Alex, what was your experience with students like Taylor and Alex?

Extremely bad : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Excellent

44. How competent do you feel to provide APE services for a student like Taylor and Alex?

___ Not at all competent ___ Somewhat competent ___ Competent ___Very competent

45. Please indicate your perception of the following statement:

Students with severe disabilities at the sensorimotor stage of learning are provided effective APE services at my school.

Strongly disagree : 1 : 2 : 3 : 4 : 5 : 6 : 7 : Strongly agree

46. Where do you believe that students like Taylor and Alex should receive physical education?

General Physical Education Setting: _____

PE in Separate Class: _____

Other (describe): _____

47. In your district/charter, can you exclude a student like Taylor and Alex from receiving APE services?

___ Yes ___No

48. What was the reason(s) for excluding students like Taylor and Alex from being provided APE services? Please check all that apply.

1. ___ Safety concerns.
2. ___ No paraprofessional support.
3. ___ Lack of preparation.
4. ___ Assessment issues.
5. ___ Extra burden.
6. ___ No equipment.
7. ___ Lack of knowledge about APE.
8. ___ Inappropriate PE program for students with disabilities.
9. ___ Other: _____

49. If you have total freedom to choose, would you provide APE services to students like Taylor and Alex?

Yes _____ No _____

Adapted Physical Education Service Provision

50. With the students like Taylor and Alex that you have provided APE services for, how often did you provide the following research-based strategies, evidence-based practices, accommodations, and modifications for these students?

Repeat directions	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Assign a peer tutor	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Change rules of the game	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always

Adapting for safety	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide adapted equipment	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide extra skill instruction	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Modify fitness testing	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Give special reinforcement	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Implement a routine	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide least-to-most prompting	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide most-to-least prompting	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide hand-over-hand guidance	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide hand-under-hand guidance	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide tactual modeling	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide visual modeling	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always
Provide one-on-one instruction	Not at all	: 1 : 2 : 3 : 4 : 5 : 6 : 7 :	Always

Appendix K

Professional Development Formats

	Level of Education		Certification Held				Years of Experience			
	Bachelor's Degree	Master's Degree	Certified Adapted Physical Educator	Physical Education	Special Education	Other	1-3 years	4-6 years	7-10 years	More than 10 years
Attendance at a district or regional workshop	4	15	12	16	14	5	5	6	0	6
Attendance at a regional APE conference	1	15	8	12	13	3	7	5	0	3
Attendance at a national or state APE conference	1	2	2	3	2	0	3	0	0	1
Formal college/university course	0	3	1	3	3	0	0	2	0	1
Observation of other APE service providers as personal professional development	2	13	9	12	12	3	3	4	0	6
Formal or informal collaboration with other APE service providers	5	14	11	15	15	6	3	5	0	8
Other	0	3	3	3	3	2	1	2	0	0

Note: Focused on students at the sensorimotor stage of learning attended in the past 3 years

Appendix L

Recommendations for Districts, Professional Development Instructors, and Course Instructors

District Considerations

In-service training should:

- Support APE service providers' knowledge and understanding of physical and motor skill development and implement developmentally meaningful instruction using purposeful instructional practices of the targeted skill.
- Increase APE service providers' understanding of their professional roles and responsibilities.
- Address APE service providers' lesson planning practices by promoting student centered lessons with direct instruction and active practice on students' individualized goals and objectives indicated in the IEP.
- Support APE service providers' knowledge and understanding of strategies and practices most relevant to students with severe disabilities at the sensorimotor motor stage of learning.
- Expand APE service providers' understanding of students' Zones of Proximal development to ensure instructional time is meaningful.
- Increase APE service providers' skills to develop and implement sensorimotor routines with evidence-based practices.

Professional Development Instructors

Should address:

- Physical and motor skill development.
- APE service providers roles and responsibilities.
- Lesson planning practices.
- Research based strategies and evidence-based practices that promote active participation.
- Identification of Zones of Proximal development to support meaningful instruction.

- Provide opportunities to engage in ongoing collaboration with other APE service providers.

Course Instructors

Additions to current curriculum:

- Increase number of courses offered or required.
- Emphasize research-based strategies and evidence-based practices.
- Content focused on instructional practices relevant to students with severe disabilities at the sensorimotor stage of learning.