Implementing the Adapted Physical Education E-learning Supplement into Physical Education Teacher Education Program

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A Dissertation

Presented to

The Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

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December 2014

ABSTRACT

Since the first special education classes were implemented in general schools in Korea in 1971, special education in Korea has gone through rapid development (Hwang & Evans, 2011). According to the Ministry of Education (2014), the approximate number of students with disabilities in Korea is 87,278, and of these, 61,451 students with disabilities are included in general school settings. This means that about 70.4 % of all students with disabilities are included in general schools. However, studies showed that GPE teachers would not feel comforatble or prepared to include students with disabilities (Oh & Lee, 1999; Roh, 2002; Roh & Oh, 2005). Since a lack of academic preparation in Physical Education Teacher Education (PETE) program was one of the primary reasons for lack of competence in GPE teachers toward including students with disabilities (Ammah & Hodge, 2006), it is necessary to develop and implement an Adapted Physical Education (APE) educational supplement throughout PETE curriculum. The purpose of this study was to explore whether an APE e-learning supplement would have an impact on the level of self-efficacy and content knowledge of pre-service teachers related to including students with intellectual disabilities. An APE supplement was developed based on the Instructional Design Model (Dick, Carey, & Carey, 2005) to provide three sources of self-efficacy, mastery experience, vicarious experience, and social persuasions. Three groups of pre-service teachers (N=75) took the same content supplement with different delivery system, E-learning group (n=25) with online, traditional group (n=25) with printed handout, and control group (n=25) without

supplement. Two instruments, the Physical Educators' Situation-Specific Self-efficacy and Inclusion Student with Disabilities in Physical Education (*SE*-PETE-D) and the content knowledge test, were given to all participants twice (i.e., pretest and posttest). A 3x2 mixed effect ANOVA revealed that pre-service teachers' perceived self-efficacy (p=0.023) improved after taking the e-learning supplement. However, there was no significant difference in the level of content knowledge (p=0.248). A modified Post-Study System Usability Questionnaire (PSSUQ) was employed to measure the level of satisfaction toward the supplement. The result indicated that the e-learning group showed significantly higher satisfaction levels than the traditional group did in usability and content quality.

DEDICATION

To Dr. Sungnam Hwang, my loving husband,
whose support for me has made me the person I am today.

To Edward Hwang, my amazing son,
who inspires me all the time.

To Clare Hwang, my daughter,
who gives me a reason to live.

ACKNOWLEDGEMENTS

The writing of this dissertation has been one of the most challenging endeavors of my academic career. Without the support and encouragement of my professors, the achievement of the work presented would not have been possible. I would like to take this opportunity to express my appreciation toward them.

I would first like to acknowledge and thank my advisor, Dr. Martin Block, for your support and encouragement over the years. I truly appreciate your time and support. I feel blessed to have had the privilege to work under the supervision of such a knowledgeable and respected dissertation committee: Dr. Martin Block, Dr. B. Ann Boyce, Dr. Diane Whaley, and Dr. Susan Mintz. I learned a lot more than I expected not only academically but also my integrity as an educator. Your consistent support motivated me to work on the research presented in this dissertation.

I would like to thank my father, Young Il Kwon and my mother, Nam Soon Bae, for unconditional love and support.

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CHAPTER ONE
INTRODUCTION

In 1948, the United Nations adopted the Universal Declaration of Human Rights as the foundation of international human rights law. This inspired a continual shift from segregation to inclusion in general society (e.g., Standard Rules of Equalization of Opportunities for Persons with Disabilities, 1993; United Nations Convention on the Right of Persons with Disabilities, 2006). More recently, UNESCO (1994) emphasized the right to inclusive education via the Salamanca Statement and Framework for Action on Special Needs Education (UNESCO, 1994). As a result, governments acted to ensure that all children be included in one school system (Pecora, Whittaker, Maluccio, & Barth, 2012). Currently, this international trend of including students with disabilities in general education settings is observed in General Physical Education (GPE) classes (Oh et al., 2010), and is supported by several studies (Kudláček, Válková, Sherrill, Myers, & French, 2002; Linert, Sherrill & Myers, 2001; Meegan & MacPhail, 2006). Since studies have indicated that GPE can provide a successful and meaningful experience for students with disabilities (Block, 2007; Block & Obrusnikova, 2007; Klavina, 2008; Obrusnikova, Valkova, & Block, 2003; Sherrill, 2004), on an international scale, inclusion is increasingly believed to be the preferred setting for physical education provision for students with disabilities.

However, unfortunately, research indicates that experiences of students with disabilities in GPE often are not always positive, and in fact they often experience feelings of isolation, frustration, and failure in GPE settings (Blinde & McCallister, 1998; Goodwin & Watkinson, 2000; Hutzler, Zach, & Gafni, 2005; Place & Hodge, 2001). For example, Goodwin & Watkinson (2000) interviewed nine students with physical disabilities aged 10-12 years about their experiences in GPE. Students' responses indicated that they had been teased by their peers and felt out of place during GPE. During the focus group interview, several students further described the feelings towards GPE as having "good" days and "bad" days. Specific examples were given about "good" days when students felt a sense of belonging, shared benefits with peers, and exhibited skillful participation; "bad" days were associated with experiences such as social isolation, restricted participation, and having their competence questioned.

One of the major reasons students with disabilities don't always experience success in GPE is that physical educators often do not feel they have the proper training or experience to work with students with disabilities, and thus instructors often lack confidence in their abilities to make the appropriate accommodation and modifications (Ammah & Hodge, 2006; Chandler & Greene, 1995; Hardin, 2005; Hodge, 1998; Kowlaski & Rizzo, 1996; LaMaster, Gall, Kinchin, & Siedentop, 1998; Linert, Sherrill, & Myers, 2001).

A key factor in the success of any inclusive physical education class is the training, competence, and the resulting confidence of the teacher (Block & Rizzo, 1995; Block, Taliaferro, Harris, & Krause, 2009; Hutzler, Zach, & Gafni, 2005; Lepore, Gayle, & Stevens, 1998). Research measuring perceived competence and confidence in physical

educators related to including students with disabilities in their classes indicates that GPE teachers feel they have not been adequately prepared to work with students with disabilities (Hardin, 2005; Haycock & Smith, 2011; Kowalski & Rizzo, 1996; Meegan & MacPhail, 2006; Rizzo & Kirkland, 1995). This perception of lack of preparation leads to questions about the adequacy of Physical Education Teacher Education (PETE) programs in providing appropriate training to the pre-service teachers.

Current studies have shown that most university PETE programs still require only one introductory Adapted Physical Education (APE) course (e.g., physical education for children with disabilities, Introductory Adapted Physical Education) (Kwon & Block, 2013; Piletic & Davis, 2010). Similarly, Oh et al. (2010) reported many of the PETE programs in the United States require a course in APE, but in other countries (e.g., Korea and China), the APE course is an elective. Since taking one APE course is probably not enough to truly train future GPE teachers to work with students with disabilities, DePauw and Goc Karp (1994), Kowalski (1995), and Rizzo and Kirkland (1995) argued that the standard PETE curriculum should be redesigned to better inform teachers about including students with disabilities by infusing disability concepts throughout the overall PETE curriculum. With this trend, researchers suggested that university Physical Education Teacher Education (PETE) programs should begin to modify their curricula to train future GPE teachers (Jin, Yoon, & Wegis, 2013; DePauw & Goc Karp, 1994).

Inclusive Physical Education in Korea

In Korea, since the first special education classes were developed in general schools in 1971, educating students with disabilities has gradually shifted from special schools to special classes within general education schools. In 1997, the Special Education

Promotion Act (SEPA) was mandated; the term "inclusion" was introduced in Korea. Since the passing of the revised SEPA, inclusion in Korea has increased. From 2000 to 2006, the number of special schools increased from 143 to 239. However, the number of special classes in general schools significantly increased from 3,802 to 5,204 (Ministry of Education and Human Resources, 2006). In 2014, the number of special classes in general schools reached 9,617 (Ministry of Education, 2014). Since more students with disabilities are included in general education schools, it is likely that these students are also included in general physical education classes. Unfortunately, studies (Oh & Lee, 1999; Roh, 2002; Roh & Oh, 2005) indicated that this is not necessarily the case.

Rho (2002) studied the status of inclusion in Korea. A total of 120 in-service teachers ($N = 120$) participated in the study, and the results revealed that 85% of students with disabilities were not fully included or were excluded from GPE classes. Thirty percent of GPE teachers refused to teach the students with disabilities, asking the students with disabilities to stay in their classrooms or take a break during the PE classes. In other words, in Korea, most of the students with disabilities in general schools were not included in the GPE classes, and GPE teachers often choose not to include students with disabilities in their classes. While there is more pressure on GPE teachers to include students with disabilities, a recent study confirms that exclusion still exists, with as many as 50% of GPE teachers in Korea still choosing not to include students with disabilities in their GPE classes (Jeong & Block, 2011).

There are limited studies that investigated GPE teachers' attitudes toward including students with disabilities in Korea (Jeong & Block, 2011; Oh & Lee, 1999; Roh & Oh, 2005). Jeong and Block (2011) investigated Korean physical educators' attitudes,

beliefs, and intentions toward teaching students with disabilities based on Ajzen & Fishben's (1980) theory of planned behavior. The results revealed that teachers' competence, teaching experiences, and beliefs were highly correlated with teachers' behaviors in teaching students with disabilities. Oh and Lee (1999) used Rizzo's (1993) Physical Educators' Attitude Toward Individuals with Disabilities (PEATID-III) to explore Korean GPE teachers' attitudes toward teaching students with disabilities. Results revealed that the best predictor of favorable attitudes toward teaching students with disabilities was the quality of GPE teachers' experiences in teaching students with disabilities, and the second best predictor was whether the GPE teacher had taken APE coursework. GPE teachers who have teaching experiences and who have completed APE courses showed more favorable attitudes toward teaching students with disabilities.

However, the curriculum study that compared the Korean system to the U.S. PETE system revealed that APE course is an elective course in most PETE programs in Korea (Lee & Choi, 2011; Oh et al., 2010). Research also found that some universities in Korea do not even offer any APE courses in their PETE program (Lee & Choi, 2011; Oh et al., 2010). Results from these PETE curriculum studies suggest PETE programs in Korea do not provide appropriate training to future PE teachers for including students with disabilities.

Infusion Approach Curriculum

In the early 1990s, apprehension about the inadequate state of teachers' preparation in working with students with disabilities in GPE classes prompted studies that used the infusion approach in PETE programs. The infusion approach curriculum means infusing disability concepts into the overall PETE curriculum; this means that teaching and

training programs like PETE and APE no longer provide a segregated curriculum (Kowalski, 1995). DePauw and Goc Karp (1994) viewed the infusion approach curriculum as comprising three levels: additive, inclusive, and infusion. The **additive level** is the stage in which specific information regarding individuals with disabilities is simply added to the course, and the **inclusive level** is the stage of questioning assumptions and educational goals, and it allows pre-service teachers to have a learning experience (e.g., practicum experience) through the courses (DePauw & Goc Karp, 1994). Finally, the **infusion level** suggests that all concepts of disabilities are interconnected throughout the overall curriculum, so that pre-service teachers are likely to develop competence in teaching students with disabilities (Hodge, Davis, Woodard, & Sherrill, 2002) along with a positive attitude (Hodge, Tannehill, & Kluge, 2003).

Studies revealed that an infusion approach curriculum model could positively affect students' attitudes toward individuals with disabilities (Barrette, Holland Fiorentino, & Kowalski, 1993; DePauw & Goc Karp, 1994; Lepore & Kowalski, 1992). There is evidence that the infusion approach curriculum positively correlates with attitudes and beliefs of pre-service teachers. For example, Kowalski and Rizzo (1996) examined pre-service teachers' (N = 133) perceived competence and their attitudes toward teaching individuals with disabilities who were enrolled in an infusion approach curriculum. Results revealed that pre-service teachers who took more courses based on the infusion approach curriculum had more positive attitudes toward teaching and working with individuals with disabilities. Hardin's (2005) study also showed that students who experienced an infusion approach curriculum had a higher level of confidence in their abilities to teach students with disabilities.

However, there are still barriers in developing an infusion approach curriculum. Power (2004) studied faculty perspectives on the infusion of environmental education into methods courses for pre-service teachers. He revealed that faculty agreed to infuse the environmental education into pre-service science and social studies methods courses by sharing sources and connecting to local communities. Still, there were some difficulties in integrating the infusion approach curriculum. Time pressure was a major constraint; faculty had to work within limited lecture hours, and students were overextended. Since universities pressured their faculty to decrease the number of credits pre-service teachers needed to graduate, faculty members were reluctant to set precedents for more add-ons in their limited lecture hours. Another barrier was the pressure/competition of other groups who wanted to be included in the curriculum. To successfully apply an infusion approach curriculum, it is believed that alternative instructional methods are necessary to control constraints such as time, pressure, and workload.

E-Learning Environment

Much research has been conducted to find alternative instructional methods to meet the needs of universities and students to overcome the barriers in general education curricula (Smith & Jones, 1999; Smith & Southern, 1999). Many institutions of higher education offer e-learning courses in degree programs, through interactive multimedia and the Internet, to infuse learning modules and special education issues in traditional elementary and secondary preparation (Smith & Meyen, 2003).

"E-learning can be defined as the use of computer network technology, primarily over an Intranet or through the Internet, to deliver information and instruction to

individuals" (Welsh, Wanberg, Brown, & Simmering, 2003, p. 345). Much of E-learning instruction also delivered through all electronic media, including audio/video tape, CD-ROM, intranet, extranet, interactive TV, and satellite broadcasts (Shank & Sitze, 2004).

While there has been a long and well-established history of studying the efficacy of teaching and learning through e-learning courses in terms of cognitive factors and student satisfaction (Woltering, Herrler, Spitzer, & Spreckelsen, 2009), the research outcomes are varied (Campbell, Floyd, & Sherida, 2002). Several studies showed that there is no difference between e-learning classes and traditional classes in terms of cognitive factors, such as academic performance, achievement, examination results, and grades (Campbell, Floyd, & Shefida, 2002; Carswell, 2000; Smith, Smith, & Boone, 2012). In addition to cognitive factors, researchers were also interested in the affective domain, such as student satisfaction and student attitudes. Some research has suggested that participants in e-learning showed positive perceptions of learning outcomes and the learning environment (Johnson, Aragon, Shalik, & Plama-Rivas, 2000; Sullivan, 2002).

Specifically, Smith, Smith, and Boone (2012) compared the effectiveness of lecture, guided instruction, and collaborative discussion between an e-learning and a traditional classroom environment in a teacher preparation program. Results indicated no difference in cognitive factors between the two educational environments. However, it appeared a significant number of students in the traditional environment chose not to participate in classroom discussion, while 100% of students online contributed to the discussion. Although many studies (Bartley & Golek, 2004; Spector, 2005; Koh & Boswell, 2011) reported admirable cost savings and compatible outcomes in online

learning when compared with face-to-face learning, universities are still struggling with how to integrate e-learning effectively (Croft-Baker, 2001).

Blended Learning

Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction (Horn & Staker, 2012). Applying the blended learning model could provide elements of student control over time, place, path, and/or pace (Horn & Staker, 2012). Currently, blended learning is popular with many educators who view it as a necessary component of classroom teaching that can promote effective learning. Research has revealed advantages to blended learning. For example, Jusoff and Khodabandelou (2009) showed that blended learning decreases the distance and increases the interaction between students and their instructors compared to pure e-learning. Graham (2006) categorized the advantages of the blended learning system into three categories: pedagogic richness, flexibility, and increased cost-effectiveness. Heinze and Procter (2004) argued that blended learning could be a more valuable tool for students with different learning styles than a traditional or e-learning-only course.

Specifically, Ocak (2011) studied regarding the blended coursework in faculty perspectives. Results revealed that many faculty members' responses for the definition of blended learning have related to traditional college settings in which in-class activities are mixed with web-based activities. Faculty responses indicated that blended learning is an integration of course activities that can promote student interaction through various computer-supported communication strategies. Faculty in this study also indicated that they believed blended learning provides diverse opportunities for participating students

into enriched learning activities, and that blended learning can help faculty follow up on student progress with these learning activities.

A blended approach to e-learning seems suitable for infusing disability concepts in the PETE curriculum. However, there have been no studies of PETE or APE regarding blended learning as a method for an infusion approach curriculum.

Self-Efficacy

Self-efficacy is a task-specific and situation-specific form of self-perception (one's perception of one's ability to perform a certain behavior successfully) and competence, and is defined by Bandura (1997) in this way: "Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influences over events that affect their lives" (Bandura, 1997, p. 27). In other words, pre-service PE teachers typically have high self-efficacy in their abilities to teach physical education content and motor skills; however, self-efficacy tends to decrease when students with disabilities are included within the general physical education setting (Block, Taliaferro, Harris, & Krause, 2010).

Self-efficacy theory involves influential sources that directly affect self-efficacy in individuals (Bandura, 1997, 1994). Four sources contribute to one's individual levels of self-efficacy: a) mastery experience, b) vicarious experience, c) social persuasion, and d) physiological states. These four sources of self-efficacy interact to establish, determine, and predict individual levels of self-efficacy. First, mastery experiences are noted as being the strongest indicator or most effective source to enhance self-efficacy (Bandura, 1994). Second, vicarious experiences are acted out by a second party as the individual lives through the experience as an observer. Third, social persuasion provides

support and encouragement from individuals, such as peers or colleagues. Finally, physiological states are factors we feel through our body, such as stress, fatigue, aches, anxiety, and mood (Bandura, 1994). The investigation of sources of self-efficacy is important to further understand how GPE teachers construct their self-efficacy to include students with disabilities.

It is believed that individual levels of self-efficacy influence one's level of performance (Bandura, 1994). Individuals with higher levels of self-efficacy are more likely to try a task, such as making accommodations to include students with disabilities, compared to those with lower levels of self-efficacy. According to the theory, two people with similar abilities may perform very differently due to their respective levels of self-efficacy (Pajares, 2002). Bandura (1997) argued that "individuals' level of motivation, affective states, and actions are based more on what they believe than what is objectively true" (Bandura, 1997, p.2). Self-efficacy theory would suggest that how pre-service PE teachers feel about their abilities to include students with disabilities in general physical education will directly affect their effort and ultimately their actual behavior in making modifications for students with disabilities in their classes.

While self-efficacy theory has been used successfully in research with general and special education teachers (Armor et al., 1976; Ashton & Webb, 1986; Roll-Peterson, 2008; Soodak & Podell, 1993; Woolfolk, Hoy, & Davis, 2006) and with PE teachers (Martin & Kulinna, 2003, 2004, 2005; Stephanou & Tsapakidou, 2007), there is only one major study that has used self-efficacy theory in adapted physical education. Hutzler, Zach, and Gafni (2005) applied self-efficacy theory about the inclusion of students with disabilities in general physical education in PETE majors. Participants (N = 153) were

asked to comment on their confidence toward including students with four different disabilities: (a) physical disabilities, (b) developmental disorder, (c) attention deficit disorders, and (d) visual impairments. It was concluded that higher self-efficacy was significantly related to variables including previous experience in instructing students with disabilities, attendance in a course focused on students with disabilities, and years in the PETE program. These researchers also concluded that self-efficacy was related to attitudes toward teaching students with disabilities in physical education. It is important to note that while Hutzler, Zach, and Gafni (2005) did explore using the self-efficacy theory, there has been no research conducted on the effectiveness of an APE e-learning supplement measuring pre-service teachers' self-efficacy change.

Since there has been a considerable amount of research on the unfavorable attitudes of GPE teachers toward including students with disabilities in their classes, new methods to adequately train GPE teachers should be considered.

Statement of the Problem

A global trend toward including students with disabilities in GPE has been observed (Oh et al., 2005). However, many studies have reported that GPE teachers have difficulties including students with disabilities (Hardin, 2005; Haycock & Smith, 2011; Kowalski & Rizzo, 1996; Meegan &MacPhail, 2006; Rizzo & Kirkland, 1995). Similarly, research indicates many GPE teachers feel they are not adequately trained to include students with disabilities (Hodge, Ammah, Casebolt, LaMaster, & O'Sullivan, 2004; Hardin, 2005; Oh & Lee, 1999; Roh & Oh, 2005). Specifically, one study (Block, Hutzler, Barak, & Klavina, 2013) indicated that GPE teachers were not confident in their abilities to modify team sports for students with physical, visual, and intellectual disabilities. In addition,

studies showed that GPE teachers had more difficulties including students with learning/intellectual disabilities (ID) than including students with physical or sensory disabilities (Clough & Lindsay, 1991; Ward, Center, & Bochner, 1994). Clearly, it is necessary to train pre-service PE teachers in methods to accommodate students with ID into team sports before they initiate their teaching in the field. However, to date there is limited research on how to adequately train pre-service PE teachers in their PETE programs.

In the early 1990s, apprehension about the inadequate state of teacher preparation in working with students with disabilities in GPE classes prompted studies that used the infusion approach in PETE programs (DePauw & Goc Karp, 1994). The infusion approach infuses the disability concept into the overall PETE curriculum; this means that teaching and training programs like PETE and APE would no longer provide a segregated curriculum (Kowalski, 1995). Several studies applied different methods in integrating the infusion model into their program, such as inviting guest lecturers, providing practicum, and using simulations to enhance understanding of certain disability concepts (DePauw & Goc Karpt, 1994; Kowalski & Rizzo, 1996; Lepore & Kowalski, 1992). Even though universities and faculties have put efforts toward systematically infusing disability concepts in PETE programs, barriers include the time required and the cost. To control these barriers, blended learning in the form of applying e-learning into PETE coursework as a means of integrating the infusion approach curriculum could be one alternative instructional method to train future GPE teachers.

Studies reported that globally, 80-90% of college classes are blended (Kim et al., 2006), and more than one billion learners around the globe advance their skills through

this instructional method (Kim, Bonk, & Teng, 2009). In Korea, more than 85% of universities of colleges implement blended learning environments by applying e-learning into their courses (Leem & Lim, 2007). Applying blended learning into PETE programs could be an alternative instructional strategy to train pre-service GPE teachers for including students with disabilities.

Purpose of the Study/Research Questions

The purpose of the study was to explore if an APE supplement in PETE courses would have an impact on the self-efficacy and content knowledge of pre-service Physical Education (PE) teachers related to including students with ID in their team sports classes. Specifically, the purposes of the study are: (a) to measure the self-efficacy levels of pre-service physical educators related to including students with ID in their team sports classes before and after taking an e-learning supplement or a traditional printed supplement, (b) to measure the content knowledge of pre-service physical educators related to including students with ID in their team sports classes before and after taking an e-learning supplement or a traditional printed supplement, and (c) to measure the level of satisfaction regarding using two different types of supplements.

RQ1: Does an APE supplement have an impact on the self-efficacy of pre-service teachers toward including students with ID in their team sports classes?

*H*o: Pre-service physical educators' self-efficacy to include students with ID in team sports classes will have no change following taking a supplement.

RQ2: Does the e-learning supplement have an impact on pre-service teachers' level of content knowledge regarding including students with ID in the team sports classes?

*H*o: Pre-service physical educators' level of knowledge regarding including students with ID in general team sports classes will have no change following taking a supplement.

RQ3: Is the participant satisfied with the supplement in terms of usability, accessibility, content, and format?

Sub RQ3: Are statistically significant differences observed between the satisfaction levels for the e-learning group and the traditional group?

Sub *H*o: The results of the satisfaction survey indicate there is no statistical difference observed between the e-learning group and the traditional group.

Definition of Terms

Within the context of this study, the terms used were defined as follows:

E-learning. "E-learning refers to the use of electronic media, information, and communication technologies in education. E-learning is broadly inclusive of all forms of educational technology in learning and teaching. E-learning is inclusive of and broadly synonymous with multimedia learning, technology-enhanced learning, computer-based instruction, computer-based training, computer-assisted instruction or computer-aided instruction, Internet-based training, web-based training, online education, virtual education, virtual learning environments (which are also called learning platforms), m-learning, and digital educational collaboration" (Wikipedia, 2014).

Blended Learning Environments. Blended learning is a formal education program that provides some part of content or instruction via online delivery with component

that allows students can control their instructional time and pace (Horn & Staker, 2012).

Inclusion. A philosophy in which students with disabilities receive an appropriate, individually determined physical education program within the general physical education setting alongside students without disabilities (Block, 2007).

Infusion Approach Curriculum. "Information regarding individuals with disabilities is systematically introduced throughout undergraduate curricula" (DePauw & Goc Karp, 1994)

Pre-service physical educators. Pre-service teachers are undergraduate students who are majoring in a teacher education program involving school-based field experience.

Self-efficacy. "Belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3).

*Intellectual Disabilities. "*Intellectual disability is a disability characterized by significant limitation in intellectual functioning and in adaptive behavior expressed in conceptual, social, and practical adaptive skills. The disability originated before the age of 18" (American Association on Intellectual and Developmental Disabilities, 2008, p.1).

*Team Sports. "*Team sports include any sport which involves players working together towards a shared objective. A team sport is an activity in which a group of individuals on the same team work together to accomplish an ultimate goal, which is usually to win. This can be seen in sports such as hockey, soccer, basketball, volleyball, tennis, lacrosse, American football, rowing, cricket, team handball and many others"(Wikipedia, 2014).

Delimitations

The study is delimited in the following areas:

1. Pre-service physical educators from one university in Korea were included in the study.
2. Only pre-service physical education teachers who agreed to volunteer and who returned: (a) consent forms and (b) pre/post *SE*-PETE-D and the content knowledge test will be included in the study.
3. Only pre-service physical educators' self-efficacy to include students with intellectual disabilities in team sports classes will be addressed in this study.
4. The supplement in this study provided only the first level (the additive level) of inclusion in an infusion approach curriculum.

CHAPTER TWO
REVIEW OF LITERATURE

The main purpose of this study is to examine the effectiveness of an APE supplement on perceived self-efficacy and level of content knowledge of pre-service PE teachers towards including students with ID in the team sports classes. This chapter provides a review of the relevant literature related to the purpose of this study. Specifically, this chapter focused on: (a) theoretical framework, (b) inclusive physical education in Korea, (c) infusion approach curriculum, (d) e-learning and (e) blended e-learning in higher education.

Theoretical Framework

In this study, pre-service PE teachers' self-efficacy toward including students with disabilities will explored through the framework of Bandura's self-efficacy theory. Within the social cognitive framework, self-efficacy theory indicates that the role of self-referent beliefs as the essential component that determines goal–directed behavior (Feltz, Short, & Sullivan, 2008). Bandura (1986) said that in the social cognitive view, people are "neither driven by internal forces nor automatically shaped and controlled by external stimuli" (p.18). In other words, people evaluate their behaviors and cognitive and environmental events in a reciprocal way (reciprocal determinism) and from this information anticipate consequences (See Figure 1).

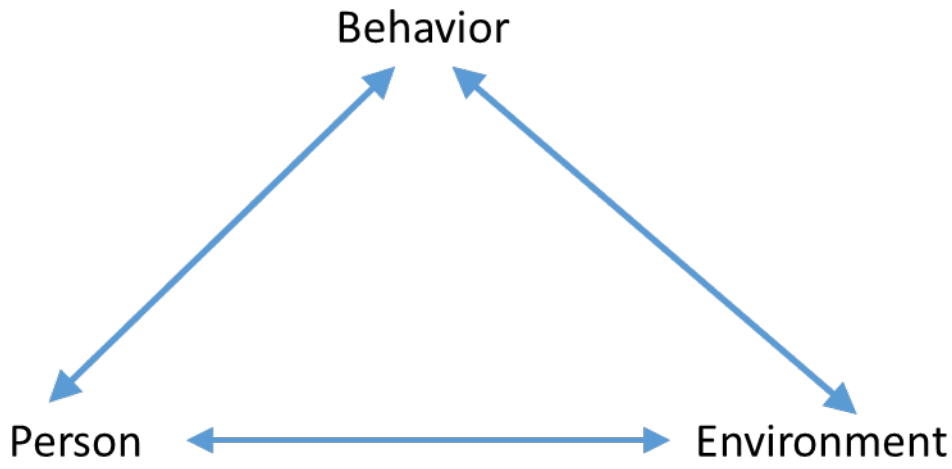

Figure 1. Triadic Model of Social Cognitive Theory.

Within the social cognitive framework, self-efficacy theory addresses the role of self-referenced beliefs as the core factor that determines people's goal-directed behavior (Feltz, Short, & Sullivan, 2008). It is believed that self-efficacy is the most important mediator of behavioral change in social cognitive theory (Bandura 1986, 1997).

Self-efficacy is context specific, situation specific, and task specific, as individuals use their judgments of self (Bandura, 1994; Pajares, 2002). Bandura (1986) defines self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance." That means self-efficacy refers to judgments made by the individual about their own behavior, task completion, or performance. He also explains, "It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura, 1986, p. 391).

A sense of self-efficacy can influence the way a person approaches tasks, goals, and challenges (Bandura, 1997). That means one can indirectly and/or directly affect self-efficacy through choice and behaviors displayed. Strong self-efficacy beliefs are highly resistant to change as a result of time and multiple experiences (Bandura, 1997). Once a positive level of self-efficacy has been established, an occasional unsuccessful experience will not have a critical impact on self-efficacy (Bandura, 1997). In contrast, weak self-efficacy beliefs are constantly reappraised in relation to the outcomes people experience as a result of their actions (Pajares, 2002). Consistent failure can have a serious damage on self-efficacy, specifically if those experiences occur in the early development stage of self-efficacy beliefs (Bandura, 1977). Once a person's self-efficacy established, this sense can generalize to different situations (Bandura, 1997).

In addition, when individuals lack the experiences in a specific task, they often over- or underestimate their true ability levels. This means, individuals tend to over- or underestimate their actual performance level when they make inaccurate judgment as to their level of self-efficacy (Bandura, 1997). Bandura (1997) explained that individuals must have appropriate levels of both skill and self-efficacy to use their abilities successfully. If the misjudgment is extremely inconsistent with reality, feedback from experience will be cognitively reflect upon and evaluated, and changes to self-efficacy beliefs will result accordingly (Bandura, 1997).

According to Pajares (2002), once individuals realize individual self-efficacy in given tasks, they will choose participate in tasks where they will be able to achieve success for the most part, and they tend to "cope and avoid" tasks or situations where they may be faced with lack of success. High self-efficacy levels have been related to high levels of motivation, the performance of more challenging tasks, the setting of higher goals, and the perseverance in reaching them (Schwarzer, 1992). In contrast, individuals with low self-efficacy are likely to avoid tasks and situations in which they do not feel competent (Bandura, 1997; Pajares, 2002). In other words, individuals with the exact same level of skill to perform a specific task may perform the task differently depending on their level of self-efficacy. For example, GPE teachers who have low self-efficacy with regard to including students with disabilities in their classes are likely to avoid the situation, but GPE teachers with high self-efficacy toward inclusion would be more motivated and put more effort toward including students with disabilities than GPE teachers with low self-efficacy.

Previous findings support the critical influence of self-efficacy beliefs on performance and motivation (Bandura, 1997). This is perhaps unsurprising given that self-efficacy has consistently been found to predict human accomplishment across diverse settings, including sports (Moritz, Feltz, Fahrbach, & Mack, 2000) and education (Multon, Brown, & Lent, 1991; Pajares, 1996). In addition to predicting performance, a substantive causal relationship has been observed between self-efficacy and personal performance (Bandura, 1982). In meta-analysis, Moritz, Feltz, Fahrbach, and Mack (2000) showed that the average correlation between self-efficacy and sport skill performance was 0.38. The result of the study indicated the significant influence of efficacy beliefs on individual's performance (Bandura & Locke, 2003).

In summary, Bandura's self-efficacy theory suggests that the motivation and performance level of an individual will be affected by efficacy motivation and perceived ability (Bandura, 1986; Bandura 1997). In other words, individuals will only perform a task as well as they think can perform a task (perceived ability). Also, they will only perform as well as they want to perform (motivation). The limitation of self-efficacy is that it is predictive of behavior only when the behavior is challenging or novel. Influence decreases as a given task becomes habitual or well learned. Even in limitation reports, self-efficacy theory has proven to be a very powerful behavioral determinant in many studies, so its inclusion in theories of behavior is warranted (Schwarzer, 1992).

Source of self-efficacy

According to Bandura (1977, 1994), individuals' levels of self-efficacy are directly related to four influential sources: (a) mastery experiences, (b) vicarious experiences, (c) social persuasion, and (d) physiological states. Bandura (1997) suggests that these four

sources of self-efficacy interact with factors within the environment (i.e. personal, social, and situational factors) to establish, determine, and predict individuals' levels of self-efficacy. It is critical when investigating the sources of self-efficacy to understand how pre-service teachers construct their self-efficacy toward including students with disabilities.

Mastery Experiences. Mastery experiences provide authentic evidence of a person's level of performance (Bandura, 1997). Mastery experiences consist of an individual's past performances of the task or skills, and they are the strongest indicator or most effective way to develop a high level of self-efficacy (Bandura, 1994). That means if an individual completed a task previously, he or she will feel a higher self-efficacy to perform the same task again. However, if an individual experiences past failures in performing a task, he or she will not feel as high as the level of self-efficacy to complete the same task next time. If a pre-service PE teacher has successful experiences including students with disabilities, he or she is more likely to have higher self-efficacy to include future students with disabilities than a pre-service PE teacher with unsuccessful experiences will have toward including students with disabilities. This supports the idea that the individual must process and reflect upon experiences (Bandura, 1994; Bandura, 1986).

Positive mastery experiences can also strengthen self-efficacy by supporting existing levels of self-efficacy beliefs. On the other hand, if individuals experience repeated failure in past attempts, they may judge themselves as low-efficacious in their ability to perform the task. As it applies to PETE, a pre-service teacher who has

experienced success in including a student with intellectual disability would likely have higher levels of self-efficacy in regard to including this student in future activities.

Vicarious Experiences. Individuals tend to assess their abilities in comparison to the performance and success of others (Bandura, 1994). Vicarious experiences can be provided by social models, and this type of vicarious experience results in when an individual sees others who are similar to them, such as peers, colleagues, authoritative figures, perform a specific task (Bandura, 1994).

Vicarious experiences are most influential when individuals perceive themselves as similar to the model. If an individual feels that he/she possesses a similar skill level as the model, then the model's success can convince the individual that he/she has the capabilities to perform and succeed as well. Observing others perform a task successfully allows for knowledge, skills, and problem solving strategies to be shared. At the same time, seeing the failure from similar others despite of sustained effort can give a negative impact on an individual's judgment of self-efficacy (Bandura, 1994, 1997).

While vicarious experiences are proposed to be less influential in general than authentic mastery experiences, they are especially influential when an individual lacks prior experience. In this instance, the information gained through vicarious experiences can influence self-efficacy beliefs due to a lack of direct knowledge of one's own abilities (Bandura, 1997). In regards to including students with disabilities, a pre-service PE teacher may need to observe others or watch videos that successfully include students with disabilities, and this would enhance the pre-service PE teacher's self-efficacy toward successful inclusion.

Social Persuasion. Social persuasion, also known as verbal persuasion, is support and encouragement from others. It occurs when an individual receives feedback on his or her work regarding their ability to perform a specific job in the specific situation. It is important to consider that when evaluating the influence of social persuasion to include the credibility, knowledge, trustworthiness, and skill of the individual providing the feedback. To deal with social persuasion experience, it is critical to take into account where the information is coming from. A pre-service PE teacher who has been persuaded that he/she can be successful in including a student with a disability by an instructor or a supervisor is more likely to strengthen his/her self-efficacy and try harder and persevere longer when faced with challenges.

Physiological Status. Physiological status is defined as factors that manifest in the body, such as stress, fatigue, aches, anxiety, and mood (Bandura, 1994). It is believed that all these factors can influence self-efficacy through information they send to the body. Bandura (1994) said that people indicate their physiological reaction as their level of performance. It is believed that physiological and emotional reactions could be a cue to expect success or failure. For example, if a pre-service PE teacher felt anxious and stressed about including students with disabilities, he or she could interpret that information as an inability to successfully include students with disabilities. In contrast, if a pre-service PE teacher kept their emotional status calm and relaxed toward inclusion, the teacher might interpret this as being able to successfully include students with disabilities into his or her class.

Understanding the sources of self-efficacy is critical to understanding how pre-service PE teachers develop their self-efficacy toward including students with disabilities.

Also, it is important to note that this could also provide direction to developing an e-learning supplement module for increasing pre-service PE teachers' self-efficacy. Therefore, self-efficacy theory provides a framework of this study in terms of how to improve pre-service PE teachers' self-efficacy toward including students with disabilities through taking e-learning supplements.

Self-efficacy in Physical Education/Adapted Physical Education

There have been several studies conducted to explore GPE teachers' self-efficacy (Martin & Kulina, 2003, 2004, 2005; Martin et al., 2008; Stephanou & Tsapakidou, 2007; Hutzler, Zach, & Gafni, 2005).

Martin et al. (2008) investigated the impact of mentoring-based professional development on physical education teachers' self-efficacy in using technology, pedometers, and computers. Experienced mentor teachers (n=15) were paired with inexperienced teachers (n=15) in a yearlong professional workshop. The workshop was designed based on Bandura's (1997) social cognitive theory, and the activities focused on using a computer and a pedometer, with the goal of improving levels of self-efficacy regarding incorporating technology. Results showed both mentors and inexperienced teachers significantly increased their levels of self-efficacy toward using a pedometer. At the same time, both had decreased anxiety levels with regard to computer use. The study used longitudinal data that allowed researchers to investigate the level of self-efficacy over time, but the small sample size (N=30) limited the ability to generalize the results. Still, it is important to note that the teachers' self-efficacy on pedometer and computer efficacy was positively influenced by professional workshop interventions based on the framework of social cognitive theory (Martin et al., 2008).

Martin, McCaughtry, Hodge-Kulinna, and Cothran (2008) found additional support for how PE teachers' self-efficacy is influenced by professional development training. The purpose of this study was to examine the effects of two versions of health-related professional development on teachers' self-efficacy to teach fitness and health-related lessons. Forth seven PE teachers (*N*=47) randomly assigned to one of the following groups: group 1: Received a one-day professional development workshop (*n*=15; lasted 8 hours); group 2: Received more extended professional development (*n*=15; two 8-hour sessions); or the control group (*n*=17). Multivariate analysis of variance (MANOVA) was employed to analyze Exemplary Physical Education Curriculum (EPEC) self-efficacy survey based on Bandura's (1986) social cognitive theory. The results revealed that groups 1 and 2 were significantly different from the control group, and self-efficacy scores using EPEC were significantly increased over time for both groups 1 and 2. In the study, they revealed that taking the professional development changed PE teachers' confidence in their abilities to teach a newly adopted curriculum. Strengths of this study included the use of a control group (*n*=20) who did not attend the professional development and served as a comparison. Of significance, the results suggested that even limited professional development, such is one day for eight hours, had a positive impact on teachers' self-efficacy.

In the field of APE, there is little research specific to self-efficacy. Hutzler, Zach, and Garni (2005) examined attitudes and self-efficacy of pre-service PE teachers in Israel toward including students with disabilities. The study focused on the variables, such as gender, previous experience, academic coursework, number of years in college, and teaching experience. A total 153 participants (*N*=153) answered two different surveys,

The Attitudes Toward Including Students with a disability in PE lessons questionnaire (ATIPE) and Self-efficacy in Teaching Physical Education Under Inclusive Conditions (SEIPE), that measured their attitude and self-efficacy including students with disabilities in four different disabilities: (a) physical disabilities, (b) developmental disorders, (c) attention deficit disorders, and (d) visual impairment. They examined participants' attitudes and self-efficacy in regards to including students with disabilities in GPE classes and found that the attitudes are correlated with (a) gender, (b) previous experience, (c) number of APE course taken, (d) number of years in college, and (e) teaching experiences.

Result indicated that females had more positive attitudes than males had toward including students with disabilities. More experience in teaching students with disabilities had higher self-efficacy than those who had no experience ($p = 0.002$). Higher attendances in courses focused on students with disabilities were significantly related to higher level of self-efficacy and attitude toward including students with disabilities ($p = < 0.001$). There was no significant difference on attitude and self-efficacy between pre-service teachers with and without previous teaching experience. The study concluded that self-efficacy was related to attitudes toward teaching students with disabilities in physical education. Limitation of the study was the unclear definition of disabilities and rating scale of the instrument. However, this study provided evidence that pre-service teachers' self-efficacy and positive attitudes toward teaching students with disabilities were related to academic support. It has been hypothesized that the more advanced the stage was in the teacher preparation process, the higher the self-efficacy and the more positive the attitude.

Summary

Self-efficacy is not the measure of the level of an individual's skill, but instead the measure of an individual's judgment of what he or she is able to do with the skill he or she has (Bandura, 1997). Pre-service PE teachers should have not only appropriate education regarding APE, but also direct or indirect experiences with students with disabilities in order to develop positive levels of self-efficacy toward including students with disabilities. Finally, self-efficacy theory provides an appropriate framework for this study to examine the improvement of pre-service teachers' self-efficacy beliefs resulting from APE-related supplements in their PETE program.

Literature Review in Inclusive Physical Education in Korea

Since the first special education classes were implemented in general schools in Korea in 1971, special education in Korea has gone through rapid development (Hwang & Evans, 2011). Since the term, inclusion was introduced in Korea with the enactment of the SEPA in 1997, a dramatic increase in the number of special education classes within general schools has been observed. For example, from 2006 to 2014, the number of special classes in general school has been increased from 3,802 to 9,617 (Ministry of Education, 2014). This demonstrates how special education in Korea is shifting from special schools to inclusive settings.

According to the Ministry of Education, the approximate number of students with disabilities in Korea is 87,278, and of these, 61,451 students with disabilities are included in general school settings. This means that about 70.4 % of all students with disabilities are included in general schools. However, Yang and Tack (2007) asserted that the status of inclusive PE in Korea has remained at a superficial level. The majority of students

with disabilities within general schools were excluded in GPE classes (Yang & Tack, 2007). Rho's (2002) study reflected this result. Rho (2002) conducted a study to determine the status of inclusive physical education in Korea ($N = 106$). Results revealed that 85% of students with disabilities were not fully included or were excluded from GPE classes, and only 15% participated in GPE classes. Interestingly, 30% of GPE teachers refuse to teach the students with disabilities by asking students with disabilities to stay in their classroom or take a break during the PE classes. That means the GPE teachers choose not to include students with disabilities into their classes. Yang and Tack (2007) also studied GPE teachers' experiences with inclusive physical education classes to determine the status of GPE classes. They interviewed five GPE teachers (N=5) to investigate GPE teachers' experiences and difficulties to understand the current status of inclusive physical education in Korea. Results indicated that GPE teachers have difficulties due to lack of information about the students with disabilities. This lack of information resulted in lack of preparation toward including students with disabilities. Participants stated that they implemented peer tutoring as a teaching strategy; however, the tutors were without training. Specifically, GPE teachers reported experiencing difficulties in providing effective PE in inclusive team sports to students with disabilities and students without disabilities.

Since the special education trend has resulted in a shift from a segregated setting to an inclusive one, it is true that more students with disabilities have been included in GPE classes. However, the studies showed that the teachers were not ready to meet the new demands posed by this inclusion (Cho, 2003; Oh & Lee, 1999; Roh, 2002; Roh & Oh, 2005). Two studies implemented Rizzo's (1993) Physical Educators' Attitude

Toward Individuals with Disabilities (PEATID-III) to investigate Korean GPE teachers' attitudes toward teaching students with disabilities. Oh and Lee's (1999) study revealed that the best predictor of favorable attitude toward teaching students with disabilities was the quality of GPE teachers' experience in teaching students with disabilities, and the second best predictor was their academic preparation. That means GPE teachers who have teaching experiences and completed more APE courses showed more favorable attitudes toward teaching students with disabilities. In other words, the study showed the importance of providing pre-service teachers with teaching experiences and APE coursework.

Similarly, Cho (2003) examined how GPE teachers' attitudes toward including students with disabilities varied depending on gender, experience, academic preparation, and personal interest toward students' education. Results revealed a significant difference among the GPE teachers' attitude by gender ($p < .05$), and teaching experience with students with disabilities ($p < .01$). Major factors that influenced GPE teachers' attitudes toward teaching students with disabilities were academic preparation ($p < .001$), the school where the educator worked ($p <. 01$), and the depth of GPE teachers' interest in students' education ($p < .05$). Jeong and Block (2011) applied Ajzen & Fishben's (1980) theory of planned behavior to investigate Korean physical educators' attitudes, beliefs, and intentions toward teaching students with disabilities. Results revealed that teachers' competence, teaching experiences, and teachers' beliefs were highly correlated with teachers' behaviors toward teaching students with disabilities. Results supported that teachers' teaching experience affected the attitudes of teachers toward teaching students with disabilities.

Because studies (Cho, 2003; Oh & Lee, 1999) indicated that academic preparation is the most important factor in predicting Korean GPE teachers' favorable attitudes toward including students with disabilities, it is important to train pre-service teachers for successful inclusion. However, the curriculum study that compared the Korean and U.S. PETE systems revealed that the APE course is an elective course in most PETE programs in Korea (Lee & Choi, 2011). They also revealed that some universities do not offer any APE courses in their PETE program. Oh et al. (2010) confirmed that some PETE programs in Korea offer the APE course as an elective course. These PETE curriculum studies show the PETE curriculum in Korea provides limited academic preparation to train pre-service teachers in the area of inclusion. Since the studies show that the ability to successfully include students with disabilities correlates with academic preparation (Hutzler, Zach, & Garni, 2005), it could be concluded that the PETE curriculum in Korea needs to be restructured to provide appropriate training to future PE teachers for including students with disabilities.

Literature Review in Infusion approach curriculum

With the growing trend moving away from policies of segregation, the number of students with disabilities who are being included in general physical education settings continues to increase (Block, 2007). However, findings indicated that GPE teachers have not been adequately trained to work with students who have disabilities (Ammah & Hodge, 2006; Block & Obrusnikova, 2007; Hardin, 2005; Hutzler, 2003; LaMaster, Gall, Kinchin, & Siedentop, 1998). It is questionable as to whether PETE programs in higher education provide adequate training to PETE students in regards to dealing with students who have disabilities and are in their GPE classes.

Current studies showed that most university PETE programs still require one APE course for PETE majors (Piletic & Davis, 2010). Hardin (2005) also indicated that most PETE programs offered one course in APE to prepare teacher candidates for teaching students with disabilities. This issue, lack of preparation of PE teachers on including students with disabilities, has been raised since the 1990s. Some researchers argued that the PETE program should be reconceptualized to infuse the disability concept in the overall PETE curriculum (DePauw & Goc Karp, 1994; Kowalski, 1995; Lepore & Kowalski, 1992).

Infusion is the systematic process of melding issues, knowledge, and awareness of individuals with disabilities throughout the undergraduate physical education curriculum. Kowalski (1995) developed three premises under which an infusion-based curriculum should be based. These premises include (1) changing the attitudes and behaviors of pre-service teachers toward working with individuals with disabilities, (2) providing learning experiences that encourage pre-service teachers to think differently about individuals with disabilities and enable them to construct new understandings, and (3) providing pre-service teachers with an opportunity to critically reflect upon experiences working with individuals with disabilities. DePauw and Goc Karp (1994) developed a chart describing a hierarchical approach towards infusion (see Table 1). There are three levels to illustrate stages to systematically infuse the disability concepts into a curriculum. The levels include additive, inclusion, and infusion: “The first level, addictive, includes the addition of general disability-related information into the content of the general curriculum courses and aims at initial familiarization of the students with disability-related topics. The second level, inclusion, includes the integration of more advanced disability-related

information into the content of the general curriculum courses and aims at stimulating students to think, hypothesize, and search into questions that relate disability. The third level, infusion, includes the interwoven disability concept within the general curriculum content and requires the commitment and cooperation of all the academic stuff and the students" (Kalyvas, Koutsouki, & Skordilis, 2011, p.24). The final goal of the infusion level is to promote faculty and students to create and implement the disability concept and be able to evaluate with comparable topics related to pedagogy and exercise science of individuals with and without disabilities (Kalyvas, Koutsouki, & Skordilis, 2011). According to Hodge, Davis, Woodard, & Sherrill (2002), the additive level is the stage in which topic-related information regarding disabilities is added to the course, and the inclusive level is the stage of questioning assumptions and educational goals, and it allows students to have a learning experience (e.g., practicum experience) through the courses. Finally, the infusion level suggests that all concepts of disabilities shoule be interconnected throughout in teaching students with disabilities (Hodge, Davis, Woodard, & Sherrill, 2002).

Since 1994, the infusion approach curriculum has been introduced and investigated. DePauw and Goc Karp (1994) introduced the infusion approach curriculum at Adelphi University (NY) and Washington State University. These two universities applied several methods in integrating the infusion model into their program such as inviting guest lecturers, providing practicum, and using simulations to enhance understanding of certain disability concepts. Through the ensuing experiences, students were exposed to many different instructional strategies and activity modifications.

Modifications were provided daily to encourage students to individualize their instruction when planning their own lesson.

Table 1. Infusion approach curriculum in higher education (Apache, 2003. P.1611)

Level	Approach	Content Level	Participant Commitment	Learning Experiences	Value Level
I	Additive	Comprehension	Comprehension	Single Isolated Unrelated Passive	Exposure Initial Awareness
Examples:	1. Guest lecture 2. View videotape 3. Modify a game 4. Assessment instrument in tests and measurement 5.Assess accessibility of sport facilities				
II	Inclusion	Application Analysis	Partial	Related Multiple Reflective	Enrichment Partial Understanding
Examples:	1. Two or more lectures 2. Journal writing at practicum sites 3. Course sections devoted to issues about laws, disability, and sport				
III	Infusion	Analysis Synthesis Evaluation	Strong	Integral Integrated Active	Enrichment Ownership Understanding
Examples:	1. Interwoven topics on disability throughout curriculum 2. Application of course topics to disabilities 3. History of disability laws and services 4. Method courses to include disability 5. Connect appropriate laws between issues 6. Discussions on sports, Paralympics, Special Olympics 7. Action research on behaviors in school				

Students were also asked to simulate their own lesson plan. Similarly, Lepore & Kowlaski (1992) introduced their infusion approach curriculum at West Chester University (PA) by inviting guest speakers into their PETE courses including the foundations of physical education course.

Shapiro, Pitts, Hums, and Calloway (2012) studied how to enhance sports management curricula through infusion of disability sport. They argued that inclusion should be now be modeled in a modern society, so that including individuals with disability becomes part of professionals' knowledge of disability sport and sport management. To adequately train future professionals relating to disability sports and successful management, leaders in the sports industry must know and understand disability sport in order to enhance the delivery of sport programs, services, and supports. They discussed how to promote sport management curricula via infusing disability sport and how to implement current social practices into their current curricula by integrating athletes with disabilities in sport. They pointed out that both internal and external support such as grants and partnerships with agencies servicing individuals with disabilities is considered one major factor. Also in-service training for faculty is another key component necessary for success. Finally they concluded the mission for sport management programs should reconceptualize their curricula by applying infusion approach curriculum. They also asserted that universities and each of individual department can create and implement their own strategy to successfully provide infusion approach curricula. Since the purpose of the study was discussed within sport management programs toward infusion disability sport content, they were unable to cover pedagogical information.

By far, the papers reviewed were about faculty perspective toward the infusion approach curriculum. Kalyvas, Koutsouki, and Skordillis (2011) studied pre-service PE teachers' perceptions and attitudes toward a disability-infusion curriculum model. They explored Greek physical education students' attitude toward participation in a course

designed with infusion approch curriculum. The attitudes and intentions of students were assessed through a set of questionnaires. The measured variables were attitudes, intentions, perceived behavior control, and the effect on important others. Participants were 470 Physical Education and Sport Science students ($N = 470$) during the 2006 to 2007 academic years at the University of Athens. The result indicated that 111 participants (23.62%) answered they had some type of experiences with individuals with disabilities, and 47 (10%) had worked with individuals with disabilities previously, whereas most (67%) had no experience. To assess the participants' attitudes toward an infusion approach curriculum, a survey was developed. The survey asked if participants were willing to choose participating in a hypothetical curriculum that applied an infusion approach model. Then MANOVA was used for statistical analyses.

In general, participants had positive attitudes and willingness toward participating in an infusion approach curriculum. Specifically, the results revealed that participants who had working experience with individuals with disabilities scored higher in perceived knowledge than participants without experience. In discussion, they pointed out that the existing curriculum in this university was traditionally segregated with only 5.5% of disability-infused courses (Kalyvas, 2007), but the findings of the study indicated that participants showed positive attitudes toward the infusion approach curriculum. Results of the study were limited by the nature of subjective studies such as the social desirability effect and personal characteristics of the participants. However, their findings revealed that participants indicated strong willingness to accept reconstruction of the segregated curriculum.

Impact of an infusion approach curriculum

Kowalski & Rizzo (1996) examined the infusion approach curriculum of the PETE program. The study examined the relationship between genders, the level of program, majors, the number of infusion-approached courses, the number of APE courses, the competence of PE students and their attitudes toward teaching individuals with disabilities ($N = 133$). The number of infusion-based courses taken ranged from one to eight ranging from a possibility of ten activity courses (e.g., basketball and volleyball) and four professional preparation lecture courses (e.g., elementary and secondary methods). Results revealed that the number of infusion-approached courses taken was significantly related to attitudes. In other words, the more infusion-approached courses, the more positive the attitudes were towards teaching individuals with disabilities. In this study, the infusion component of the courses primarily occurred during the second and third year of the undergraduate curriculum. Limitations of the study were: (a) no random sample, (b) no control group, (c) no investigating students' prior experience with individuals with disabilities, and (d) assessing only perceived competence. Even when this study revealed the change in attitude of pre-service teachers toward individuals with disabilities, it would provide clearer evidence if they compared differences in attitude between the infusion group and the traditional segregation group. However, a significant contribution was still made to show the positive effect of an infusion approach curriculum.

Apache and Rizzo (2005) evaluated the effectiveness of an infusion-approached curriculum on attitudes of pre-service PE teachers toward teaching students with disabilities. For an academic year, a total of 91 participants ($N = 91$) were exposed to an

infusion-approached curriculum as part of their core PETE courses. Participants took a pre- test and a post-test to assess the Physical Educator's Attitude toward Teaching Individuals with Disabilities III (PEATID-III, Folson-Meek & Rizzo, 1993). Results revealed that a significant positive change was observed in participants' attitudes toward teaching students with disabilities; specifically, participants' perception of teaching students with disabilities. Also there was a significant change in attitudes toward students with specific learning disabilities and those with mild to moderate mental disabilities. Participants consistently appealed for additional academic preparation. In self-reported competence, participants showed a change in perceived quality of teaching. These findings support that when exposed to issues of disability via infusion of curriculum into course content, these students self-reported they would have increased confidence in teaching and an appreciation of teaching students with disabilities.

The authors examined participants' level of knowledge of the area that was covered by the infusion through the content knowledge exam to figure out the objective effect of the infusion approach curriculum. With this suggestion, the proposed study will provide two different types of test, self-efficacy test and content knowledge test. These findings support that infusion approach curriculum can enhance the confidence of pre-service teachers in teaching individuals with disabilities.

Studies showed that universities and faculty are starting to apply the infusion approach curriculum. However, there have been a lot of barriers in this process, mainly time and cost. Power (2004) studied faculty perspectives on the infusion of environmental education into pre-service methods courses. He revealed that faculty agreed to infuse the environmental education into pre-service science and social studies

methods courses by sharing sources and connecting to local communities. However, there were some difficulties in integrating the infusion approach curriculum as time was a constraint. The faculty had to work within limited lecture hours, so students were overextended. Since universities forced their faculty to decrease the credit hours for pre-service teachers fulfilling the requirements for graduation, faculty members encountered obstacles in setting precedents for more add-ons. Another barrier was the pressure and competition of other groups who wanted to be in the curriculum. To apply an infusion approach curriculum successfully, alternative instructional methods are necessary to control constraints such as time, pressure, and workload.

Summary

Colleges and universities should provide proactive leadership in what is a critical responsibility in satisfying social needs (Boyer, 1990). Since 1990, students with disabilities enrolled in public schools have experienced dissatisfaction in general PE settings (Blinde & McCallister, 1998; Goodwin, 2001; Goodwin & Wakinson, 2000; Jeong & Block 2011; Roh, 2002). However, institutions of higher education have not kept pace to fulfill the needs of individuals with disabilities by preparing future PE teachers.

Specialized courses in APE are necessary to train future PE teachers. However, rather than just adding more specialized coursework, universities should restructure their programs and figure out how to systematically infuse information and concept about disabilities throughout the curriculum. However, constraints such as time, faculty training, and cost lead schools to maintain a segregated PETE curriculum rather than an

infusion approach curriculum. To make an infusion approach curriculum possible, alternative instructional strategies should be investigated.

Literature review in E-learning

E-learning includes all the educational instruction using of network technology (Shank & Sitz, 2004). One of major reasons to use e-learning is accessibility and flexibility: "People can log in at any computer, at any time to complete a lesson or refer to learning materials" (Shank & Sitz, 2004, p.2). Faster delivery and cost savings are other reasons to choose an e-learning environment (Bartley & Golek, 2004). For educational institutes or industries to deliver specific educational information that quickly becomes outdated, integrating e-learning modules are the most cost-effictive and faster than flying instructors across the country and requiring learners to attend the lecture or workshop for several hours (Aragon, 2003). Also, implementing e-learning program across the online network was recognized as the most effective way that meets the current academic and business environments in the global economy (Bartley & Golek, 2004). Changes in society along with increasing needs to train and retain people mean that the need to teach and learn with flexibility will only grow (Shank & Sitze, 2004).

The annual survey of 2,500 U.S. colleges and universities (Allen & Seaman, 2008), has claimed that e-learning program enrollments have more than doubled from an estimated 1.6 million students in the fall of 2002 to 3.9 million students in the fall of 2007. In one year, from 2006 to 200, e-learning enrollments in U.S. higher education institutions had increased 12.9%, and this rate was much greater than that of entire population of higher education enrolled (Allen & Seaman, 2008). In Korea, the Ministry of Education and Human Resources Development introduced the "Model Universities of

Cyber Educational Program" in 1997. Since the model has been introduced, e-learning in higher education was supported by a government program called "E-campus Vision 2007." Currently more than 85% of the universities in Korea implement e-learning (Leem & Lim, 2007). For these reasons, it could be concluded that the last decade has pushed institutions of higher education around the world to recognize e-learning as a viable alternative (or supplement) to traditional classroom instruction (Larreamendy-Joerns & Leinhardt, 2006, Tallen-Runnels et al., 2006).

Comparing e-learning vs. a traditional face-to-face learning environment

While there is a long and well-established history of studying the efficacy of teaching and learning through the medium of the Internet, the research outcomes are varied (Campbell, Floyd, & Sheridan, 2002). Several studies indicated there was no difference in cognitive factors such as academic performance or achievement, between e-learning course and traditional course (Carswell, 2000; McCleary & Egan, 1989; Naber & LeBlanc, 1994; Pirrong & Lathen, 1990; Souder, 1993; Weingand, 1984). However, other factors such as students' satisfaction revealed mixed results. Davis (1984), Richie and Newby (1989), and Pirrong & Lathen (1990) found that students in traditional classrooms were more satisfied with their learning than students in distance-learning were. On the other hand, many studies found students' attitudes favorable to e-learning (Goodwin, Miklich, & Overall, 1993; Jones, 1992; Naber & LeBlanc, 1994; Stahmer, Samaldino, Hardman, & Muffaletto, 1992). Different studies showed different opinions on satisfactions regarding the two different types of learning.

Cognitive achievement. Campbell and his colleagues (2002) studied students' performance and attitudes regarding courses taught in an e-learning environment and

courses taught onsite. A comprehensive exam that covered all the course material created and measured the students' performance. Students also completed a course evaluation designed to determine student satisfaction in specific areas. The total number of participants was 134; 120 students who took the onsite course, and 14 students who took the e-learning course. All participants answered 40 multiple choice questions covering 12 chapters. Results of the test revealed the average of onsite students as 24.4 (64%), while e-learning students answered an average of 31.3 questions correctly (78.3%). This difference is the most statistically significant finding ($p = 0.01$) in the study. In the student course evaluation and instructor evaluation, one question had a significant difference of 0.05. Students in the e-learning course felt that they had better interaction with the instructor, and that the instructor was more available/approachable for dealing with course questions, problems and issues. Another question with a response difference of 0.06 was the level of interaction. Students in the traditional course felt they had better interaction with their student peers. None of the response differences on the remaining questions were significant even at the 0.10 level. These questions showed that e-learning students were more satisfied in 10 areas, while onsite students were more satisfied in seven areas. Overall, students seemed to have been neither more nor less satisfied with e-learning instruction when compared with onsite instruction. One limitation of the study was the difference in sample size. The e-learning group had less people than the onsite group. The author also mentioned, in regards to course workload, that online students completed greater materials and activities. Variables such as age, major, and grade point average were not collected to see if there was a significant difference between the two groups.

In the teacher preparation course, Smith, Smith, & Boone (2012) questioned the effectiveness of lecture and instructional activities between an e-learning and a traditional classroom environment in teacher preparation programs. The course used technology in the general curriculum classroom. This course also offered an overview of computer-based technology integration for students majoring in special education, elementary education, or secondary education and preparing to teach in an inclusion environment. There were two lecture formats, e-learning and traditional. For the guided instruction, the online group used software packages, and the instructor used a projection device to display the instructor's computer screen to all the students. For the collaborative discussion, the traditional group took the traditional in class discussion session, the e-learning group used the digital classroom discussion, and in the online discussion, all students were asked to contribute to the discussion. Fifty-eight pre-service education students participated in the study. Each participant was enrolled in one of two concurrent offering courses. Using measured quasi-experimental, repeated-measures design, all students received both control and experimental conditions and treatment. Data were collected pretest and posttest. A repeated-measure ANOVA was conducted on the pretest and posttest data from the interventions. Notable differences between the traditional and e-learning instruction were observed in discussion activity. It appeared a significant number of students in the traditional collaborative discussion chose not to participate in classroom discussion. As the data illustrated, 100% online participants contributed to the discussion. These findings are similar to previous investigations, which found that student participation increased when instruction was presented via an e-learning format (Hiltz, 1986; Jaeger, 1991). For example, another investigation of student online

discussion by Harasim (1990) found that student participation and involvement in online discussions were a result of increased opportunity and access providing more time for students to formulate ideas and contribute response.

Connie and Cheung (2007) compared the effectiveness of online discussions and face-to-face discussions. The face-to-face group had an in-class discussion session, and the online group had a digital classroom discussion where all students were asked to contribute to the discussion. Fifty-eight pre-serviced education students participated in the study. Each participant was enrolled in one of two concurrent courses. In the measured quasi-experimental, repeated-measures design, all students received both the control and the experimental conditions and treatment. Data was collected pretest and posttest. A repeated measure ANOVA was conducted on the pretest and posttest data from the interventions. Notable differences between the traditional and the online instruction were observed in discussion activities. It appears that a significant number of students in the traditional collaborative discussion chose not to participate in the classroom discussion. As the data illustrated, 100% of the online participants contributed to the discussion. These findings are in line with previous investigations, which have found that student participation increased when the instruction was presented via online format (Hiltz, 1986; Jaeger, 1991).

Faux and Black-Hughes (2000) compared traditional, e-learning, and hybrid sections of an undergraduate social work course to investigate the effectiveness of different types of instructional methods. Their results showed that the most improvement (from pretest to posttest) was of students in the traditional, face-to-face section. Furthermore, Faux and Black-Hughes found that 41.7% of the students did not feel

comfortable learning in their e-learning course. Participants indicated that they wanted more specific feedback and auditory information from instructor; they also preferred to listen to, than read about the materials. Though this study was limited to a small sample size (*N*=33), the results raised concerns regarding (a) course design according to instructor convenience rather than student preferences, and (b) students' willingness to take responsibility for their own learning.

One study (Maki, Maki, Patterson, & Whittaker, 2000) showed that e-learning could be even more effective in students' learning than traditional instruction was. The researchers collected data from undergraduate students who enrolled in either the e-learning or the lecture section of a psychology course throughout an academic year and then compared achievements in the two different instructional modes. They found that students in the e-learning group acquired more content knowledge and achieved higher scores on the examinations than those in the traditional group did. As predicted, those taking the course online accessed and used computers more frequently than counterparts who took the traditional classes. The e-learning course experience also decreased students' anxiety regarding computers.

Spooner and his colleagues (1999) summarized the existing research in e-learning and revealed that there are no differences between e-learning and traditional face-to-face learning courses in regards to students' outcomes. In comparative studies, Russell and McPherson (2001) and Saba (2000) also found that there is no significant difference in learning outcome between those two groups. Ramage (2001) found similar results but cautioned that the multitude of variables that influenced learning and cognition may rule out any definitive answers to the question of which methodology would be most

effective. There are studies to figure out the variables that affect the outcomes. For example, Brown and Liedholm (2002), in a similar comparative course study (*N*=710), indicated that performance differences might be contributed to the level of student effort. Students in the face-to- face class spent three hours in class each week, while the e-learning and hybrid course students reported spending less than three hours per week on the course.

Student satisfaction. In addition to learning outcomes, researchers were also interested in affective domain satisfaction, e.g. students' attitudes. The researchers, interested in students' perceptions of their learning experience and perceptions of different learning activities via online using descriptive methods (Edwards & Fritz, 1997; Hansen & Gladfelter, 1996; Richards & Ridley, 1997; Sullivan, 2002), revealed that participants in their study showed positive perceptions of learning outcomes and the learning environment.

Johnson, Aragon, Shaik, and Palma-Rivas (2000) compared two graduate courses, those covered equivalent contents with different delivery systems, such as e-learning format and the traditional face-to-face one. The researchers pointed out that there must be a great dissimilarity between the two learning environments, and they questioned how to optimize the instructional design to maximize learning opportunities and achievement in both environments. The purpose of the study was to compare an e-learning course with an equivalent course taught in a traditional face-to-face format. Researchers questioned differences in (a) satisfaction with their learning experience, (b) student perceptions of student/instructor interaction and course support, and (c) learning outcomes (i.e., perceived content knowledge, quality of course projects, an final course grades) of

students enrolled in e-learning and face-to-face learning environments. Student ratings were included to compare the instructor and course quality, assessment of course interaction and support. The academic achievement was measured via course grades and students' self-assessment on various tasks. Both courses were taught by the same instructor, so that the required activities and projects were equivalent. Nineteen students were enrolled in each course ($N = 38$). To make sure the groups were equivalent, official university students records were reviewed to obtain a varied demographic of people and academic data for comparison. Student satisfaction was assessed using a course evaluation system. On instructor quality and course quality, both groups provided positive ratings, although the face-to-face group had more positive views than the online group. On student learning outcomes, both two groups were equally disgributed for the most part. On student satisfaction, both groups also indicated positive ratings on instructor quality and course quality. The mean rating for the instructor's overall teaching effectiveness for the face to face group was 4.21 (SD=.79) while the online students' mean rating was 3.58 (SD=1.07). While this difference was significant, the calculated p-value of .346 highlights the need for further research in this area. On perceptions of course interaction, the mean of the face-to-face course was 3.11 and that of the online course was 2.74. This difference was significant, t (35) = 2.455, $p < .05$. There was no differences in the variable that examined issues on course structure. The findings of this study showed that online learning could be as effective as face-to-face learning in many respects, but students in online programs might be less satisfied with their experience than students in more traditional environments.

Some researchers used correlational research to figure out the relationship between characteristics of learners, online learning environments, and satisfaction of the learner (Mortensen & Young, 2000; Swan et al., 2001; Wells, 2000). Their studies revealed that learners' prior experiences in computer related activities, quality of social interactions, and learning styles were all variables. Cleary, people with prior experiences and training in computer-related fields were more satisfied and comfortable in the online learning environment.

Other aspects. Spector (2005) studied time dimensions in e-learning environment. The researcher questioned if there was a significant difference in outcome, time demands, perceived effectiveness, and perception of benefits between e-learning and traditional environments for both learners and instructors. Three courses were involved in the study, all with an online and a traditional environment, for a total of six courses over a 17-week period. The results revealed that there was no significant difference in outcomes and perspectives throughout the courses. Students put in slightly more time in their e-learning course. However, teachers invested significantly more time on e-learning teaching than in a traditional face-to-face setting. He also pointed out that the time required to design and develop the online course was a primary factor in the cost effectiveness of e-learning. He claimed that the extra time that both teachers and learners put in for a course in an e-learning environment excluded e-learning from being undervalued as a second-rate education.

E-learning studies in Physical Education Teacher Education

Only two studies have been searched with "Physical Education" under "Online education." First, Tinning and Evans (1994) conducted a case study regarding distance

education in physical education. They proposed an Australian model for in-service teacher education. They figured out the advantage of the e-learning in time and space. They claimed the disadvantage of the e-learning model be student isolation, which means that it is the job of the instructor to provide alternative communication methods. Koh and Bowell (2011) studied how to overcome challenges in distance education such as student isolation and quality issues. They described their e-learning program, The Centa Program, at East Carolina University. The Centa Program was introduced to graduate PETE program students. To overcome the challenge of reported challenges of the distance education, the program provided both live lectures and recorded lectures. They also had an online chat room to give students an opportunity to interact with peers.

Pierre (1998) reviewed the literature regarding distance learning in higher education and introduced two success stories in the PETE program. He pointed out the reason why Emporia State University (ESU) and Kutztown University has successful e-learning PE courses. Both schools provided the content materials, assignments, bulletin board, and chat rooms. ESU even provided interactive two-way desktop video conferencing for group communication. Interestingly, Kuztown University conducted activity based course lessons online. This university opened fitness courses allowing students to participate in fitness activities outside of school but during the semester, and the students assessed their performance at the end of the course. The results of the assessment showed that all students improved their fitness level. This showed the importance of design and development in building a successful e-learning environment.

Summary

The findings of the study show that online learning can be as effective as face-to-face learning in many respects. In spite of this fact, there are still questions as to how to successfully implement an e-learning environment. In light of these findings, several considerations have emerged pertaining to the future of online programs.

Creating and implementing a successful online learning environment

Curriculum and instruction. "Learning is dynamic and interactive, regardless of the setting in which it occurs" (Council of REginal Accrediting Commisions, 2001, p.2). There are indications that e-learning instruction can be as effective as face-to-face instruction. Nonetheless, e-learning instruction may not be suitable for courses that require a high degree of student-instructor interaction (Johnson, Aragon, Shalik, &Palma-Rivas, 2000). The determining factor here is the way in which the curriculum designer integrates sound learning principles into the online learning environment (Johnson & Aragon, 2002).

Faculty support. Instructional programs that lead to degrees are organized around substantive and coherent curricula. A standard practice for instructors that teach e-learning programs is the posting of a detailed syllabus on the course web site. Furthermore, the instructor should include a road map for the course, mainly his or her expected outcomes (Alonso, Lopez, Manrique, & Vines, 2005).

Since, faculty spend tremendous time on course development and maintenance as so does course presentation in faculty perspectives (e.g. answering emails, providing feedback, and securing chat room availability), the administrators of the universities should understand and support faculty.

Student support. Research indicated that online students needed certain technical knowledge and skills to successfully participate in e-learning programs (Johnson, Palma-Rivas, Suriya, & Downey, 1999). Institutions offering e-learning programs should provide the necessary training to the student before and during their participation in an online program. Technical support should also be available to the students.

Successful online instructor. Even when an institution follows the best practices, the true impact of the learning experience relies heavily on the e-learning instructor (Huber & Lowery, 2003). First, instructors should have a broad array of life experiences and academic credentials so that they can provide real-life examples to students. Some of the better instructors were the program's adjunct professors who were either consultants or teachers. They were active practitioner and brought a wealth of experiences to the classroom especially helpful in providing tips in how to apply concepts in the real world. Second, the instructors' personality should be indicated through various communication strategies.

E-learning instructor should be trained in the e-learning experience. The e-learning instructors must develop new instructional skills (primarily related to the use of technology), as well as refining and augmenting existing skills (feedback, communication, innovation, and courseware design, among others). The educational institution can also assist instructors new to e-learning programs by providing training in the technology, instructional strategies, and teaching methods. The institution can also provide students an appropriate level of support to fulfill not only students' technical help but also their academic success.

Traditional programs will probably never disappear, but the process of learning is changed (Huber & Lowery, 2003). Many institutions use e-learning courses as a part of their programs but still require students to complete part of the coursework in traditional class format (Huber & Lowery, 2003). However, research examining e-learning course in PETE and APE in higher education is sparse. It is obvious that e-learning has the potential for future training in-service teachers to introduce new laws, teaching strategies, and equipment.

Literature Review in Blended Learning in Higher Education

The use of online network, cooperated with web-based courses, has become the prevalent and effective instructional method, especially in higher education (Derrick, 2003). In recent years, the delivery of university courses has shifted from pure face-to-face instruction to the use of e-learning resources (Williams, Bland, & Christie, 2008). The e-learning resources include lecture video/audio recordings, online discussion, online exams, and online assignment. Moreover pure e-learning courses to cover remote learning opportunities are encouraged in some circumstances (Tallen-Runnels et al., 2006). The use of e-learning resources for students has several potential advantages, including: (a) it provides students with the opportunity to share their knowledge, (b) it allows students to view course material again even if they miss face-to-face lectures and, (c) it provides students with flexibility on when they study (Brown & Ford, 2002). For these reasons, the last decade has seen a thread that encourages institutions of higher education around the world to recognize elearning as a viable alternative (or supplement) to a traditional, classroom instruction method (Larreamendy-Joerns & Leinhardt, 2006; Tallent-Runnels et al., 2006).

However, it has been observed that "the first generation of e-learning programs focused on just presenting physical classroom-based instructional content over the Internet" (Singh, 2003, p.1). More attention must be paid in considering the peculiar nature of this delivery program compared with the traditional face-to face class (Singh, 2003). This observation has led educators and researchers to realize that the two approaches are structurally different so that the direct translation of traditional material to an online one will not accessorily yield a successful program. In addition, the learning styles of each learner tend to be different, and hence, "a single mode of instructional delivery may not provide sufficient choices, engagement, social contact, relevance, and context to facilitate successful learning and performance" (Singh, 2003, p. 53). An attempt to accommodate all these revealed challenges results in what comes to be known as blended learning, or blended e-learning.

The Blended Learning Environment

Blended learning mixes various event-based activities, including face-to-face classroom learning, live e-learning, and self-paced learning. This is the combination of traditional instructor-led training, synchronous online conferencing or training, and asynchronous self-paced study (Singh, 2003). Originally, blended learning according to Singh (2003), was often associated with simply linking traditional classroom training to e-learning activities; however, definitions identified in his study constituently reflected the narrowest versions of blended course design and can be categorized into two groups:

1. Combining elements of face-to-face and e-learning courses (Allen, Seaman, & Garrett, 2007; Aycock, Garnham, & Kaleta, 2002)

2. Providing the substantial portion of content, typically relying on discussions within a planned and pedagogically driven structure (Laster, Otte, Picciano, & Sorg , 2005)

Much of the literature on blended learning are based on anecdotal reports focusing on instructors, programs, or institutional efforts to cope with the challenge of design and implementation. Blended courses are most successful when they are engaging with e-learning activities that complement face-to-face activities (Alberts, Murray, & Stephenson, 2010; Collins-Brown, 2011; Hoffman, 2003; Martyn, 2003; Poirier, 2010). Gerbic (2009) stressed that "there should be a strong integration between components; weekly topics or course content building off discussion, teacher feedback about progress or performance, and practice in face to face meeting"(p.35). Students are more motivated to participate in a required meeting and to be prepared for the deadlines of assignments or projects. Thus, they will assume more ownership of their learning. Gerbic (2009) stressed the format of the blended learning system should include the discussion followed by providing resources. Discussing the content of the resource will be required to integrate components, such as contents, discussions, and feedback from the PI.

Effectiveness of blended learning

Recently, some researchers have suggested that blended learning promises effectively boost the core of teaching and learning (Gomez & Igado, 2008). Other (e.g., Garrison & Kanuka, 2004) indicated that it could provide the learner with higher level of learning. Certain conducted researches have shown that blended learning has been very successful over the past years and it has the potential to yield better results than traditional and online learning alone (Balci & Soran, 2009). For instance, Allen and Seaman (2008)

pointed out that, one-third of all academic leaders continued to believe that the learning outcomes for blended learning are superior to those of face-to-face instruction. “Going beyond the barriers of time and location” is one of the other best potentials of blended learning (Justoff & Khodabanelou, 2009, p. 80).

There are many reasons why an instructor, a trainer, or a learner might pick blended learning over other learning options. Osguthorpe and Graham (2003) identified six reasons why one might choose to design or use a blended learning system: (1) pedagogical richness, (2) access to knowledge, (3) social interaction, (4) personal agency, (5) cost effectiveness, and (6) ease of revision. Beyond this general statement, Graham et al. (Graham, Allen, & Ure, 2003) found that instructors should choose blended learning for three reasons: (1) improved pedagogy, (2) increased access/flexibility, and (3) increased cost effectiveness.

Improved Pedagogy. As indicated above, one of the most commonly cited reasons for blending is more effective pedagogical practices. Some have seen blended learning approaches to increase the level of active learning strategies, peer-to-peer learning strategies, and learner-centered strategies (Collis & Margaryan, 2004; Hartman, Dziuban, & Moskal, 1999; Morgan, 2002; Smelser, 2002).

Increased Access/Flexibility. Access to learning is one of the key factors influencing the growth of distributed learning environments (Bonk, Olson, Wisher, & Orvis, 2002). Many studies emphasize that programs would not be possible if students were not able to have a majority of their learning experiences at a distance from instructors and/or other students (Reynolds & Greiner, 2005). Ross and Gage (2002), for

example, have seen an expansion of reduced seat time courses that allows for increased flexibility but still retains some traditional face-to-face contact.

Increased Cost Effectiveness. Cost effectiveness is the third major goal for blended learning systems in both higher education and corporate institutions. Blended learning systems provide an opportunity of reaching a large, globally dispersed audience in a short period of time with consistent, semi-personal content delivery. In higher education, there is an interest in finding cost effective solutions. The Center for Academic Transformation completed a three-year grant program designed to help universities explore ways of using technology to simultaneously achieve quality enhancements and cost savings (PEW, 2003). The University of Central Florida, for example, has predicted cost savings due to cost reductions in physical infrastructure and improved scheduling efficiencies, which have yet to materialize (Dziuban et al., 2005).

One of the major constraints applying the infusion approached model in the faculty perspectives was related to time. By applying this blended learning system, both faculty members and students can control the constraint of time. Faculty can minimize the lecture hours on disability concepts by uploading resources about disability in their online collaboration system. Then, students could access the resources based on their own pace. The constraints of applying an infusion approached curriculum can be resolved by the benefit of a blended learning system, so that the blended learning might provide a possible way to apply the infusion approach curriculum in PETE program.

Impact of the Blended E-learning

Much of the literature on blended learning are based on anecdotal reports with a focus on instructor, program, or institutional reflections regarding the challenge of design and

implementation. Blended courses are most successful when they are challenging and engaging with online learning activities that complement face-to-face activities (Crummett et al., 2010; Johnson, & Voelker-Morris, 2007; Yukawa, 2010)

According to Dziuban and Moskal (2011), blended learning refers to a redesign of the instructional model with the following characteristics: (1) a shift from teacher-centered instruction to student-centered one in which students become active and interactive learners; (2) increasing student-instructor, student-student, student-content, and student-outside resource interactions; and (3) integrated formative and summative assessment mechanisms for students and instructors. These characteristics make blended learning very effective. It has been found that the use of blended learning in teacher training programs could effectively improve pre-service teachers' critical-thinking skills and personal teaching efficacy (Khan, 2005).

Yeh, Huang, & Yeh (2011) investigated the effectiveness of blended learning in teacher training. Forty four pre-service teachers took a critical thinking instruction course for 17 weeks. The format of the course employed blended learning. Two hypotheses were proposed in this study to test whether a blended learning environment could improve pre-service teachers' professional knowledge and personal teaching efficacy related to creativity instruction. Both hypotheses were supported by the significant effects yielded from Repeated Measure ANOVA and positive responses in the reflection questionnaire. More specifically, the analytical results in this study showed that the designed training program based on the integration of the blended learning was effective in improving the pre-service teachers' professional knowledge (especially content knowledge). It also worked to improve their personal teaching efficacy and teaching creativity. Results also

revealed that blended learning, guided practice, observational learning, group discussion, peer evaluation, and feedback were all critical factors underlying the success of the course.

Delialioglu & Yildirim (2007) conducted a case study to investigate students' perception on the effectiveness of a blended learning environment. Twenty-five students enrolled in a computer network and communication course were interviewed at the end of the course. The findings revealed that: (a) access to the Internet, (b) selection of content elements, (c) learning activities and collaborations, and (d) the source of motivation all played an important role in successful blended learning. Also, access to the Internet was a critical factor to students in completing the blended course. The discussion about how much of the course should be online was an issue for the blended course in this study. They found that when the information provided online in the blended learning course was "overloaded", special attention should be required in both selecting the content and determining the amount of time to cover that content in the blended course.

Implementation of blended e-learning in higher education

The effectiveness of blended learning has been explored and reveals positive effects on students learning. Now it is important to note how to successfully implement the blended e-learning system in higher education.

Pedagogy. Pedagogy strategies used to support knowledge achievement by the learner is core to the blended course but may be the most challenging part to design. Most critically, for a blended course, it is recommended that there is an integration between the classroom and e-learning experiences (Alberts, Murray, & Stephenson, 2010; Gautsch, 2011; Hall Jr. & Mooney, 2010; Hoffman, 2003; Kim, Bonk, & Oh, 2008; Martyn, 2003;

Shibley, 2009). Recommendations for blended pedagogy are articulated in an attempt to illustrate how these strategies are unique within a blended delivery method. While many instructional strategies are suggested for classroom and online environments, there is a consistent belief that various interactivities and prompt feedbacks are key to student engagement in blended courses (Alberts, Murray, & Stephenson, 2010; Tan, Wang, & Xiao, 2010). Interactivity may involve instructor to student, student to student, or student to others, materials or resources. For example, students may complete online tutorials, share their experiences in an online discussion, and present their ideas about what they have learned in class. The value placed on interactivity is reflected in recommended instructional strategies in both face-to-face and online environments.

Assessments. Assessment is part of learning that contains information of students' learning outcomes, the level of courses, and assessment recourses. In the blended learning, however, assessment can be another challenging area. Additionally, institutions may not have administrative policies regarding the assessment schedule and the assessment methods. To make the assessment effective, the assessment administrative policy should be divided into schedule, format, and delivery system (Shibley, 2009; Hoffman, 2003; Martyn, 2003). Along with traditional objective assessments such as quizzes, exams, and essays, there are other assessments using projects, threaded discussions, and presentations (Shibley, 2009, Hofmann, 2003; Martyn, 2003; Twigg, 2003). Assessing groups rather than individuals is required when the activity is a project or a group presentation. Demanding a comprehensive assessment rather than individual contributions is emergent (Garnham & Kaleta, 2002; Hofmann, 2003; Troha, 2002).

Course implementation and student readiness. There are many researches regarding how to implement and manage blended course with consideration during the initial steps of a blended course (Collins-Brown, 2011; Hensley, 2005; Hofmann, 2003). While the recommendations reported "here may relate to course *design*, they should be a core to the actual course *delivery* when instructors make clear to the learner what is expected of them and how they can be successful" (Collins-Brown, 2011, p. 28). The communication methods in the blended learning course, expectation, and process is closely associated with student success (Collins-Brown, 2011; Hensley, 2005; Hoffman, 2003; Johnson & Voelker-Morris, 2007; Kelly, 2008). A face-to-face orientation (Martyn, 2003; Kelly, 2008) that reviews the e-learning components can remove the one of the major barriers of e-learning, lack of interaction.

Student supported learning is a common recommendation that promotes success. This includes giving prompt and specific feedback (Gautsch, 2011), clarifying and reinforcing the role of online discussions (Alberts, Murray & Stephenson, 2010), and monitoring and referencing online discussion in face-to-face meetings to substantiate their value (Alberts, Murray, & Stephenson, 2010).

To achieve success in the blended learning course, students should be able to independently manage their work, time, communication, and study (Collins-Brown, 2011; Kim, Bonk, &Oh, 2008; Rossett, Douglis, & Frazee, 2003). Several pre-course steps, such as pre-course self-assessments, practice activities and partnering (e.g., learning group) can be designed and implemented to provide opportunities to develop skills to take e-learning part of course. It is believed that students need to have a sufficient understanding of the technology used in the course to be successful (Crummett

et al., 2010; Yukawa, 2010). Prior to the course, pre-course assessments can provide critical information to students regarding prerequisite technology requirements and congigurations. Most critically, it is necessary to provide clear and accessible assistant for online technology that consequently increases student enrollment and reduces anxiety and frustration (Crummett, et al., 2010; Garnham & Kaleta, 2002; Hoffman, 2003; Johnson & Voelker-Morria, 2007; Tan, Wang, & Xiao, 2010; Yukawa, 2010).

Overall, it is believed that students do best when they are encouraged to be independent learners (Hofmann, 2003; Kim, Bonk, & Oh, 2008; Rossett, Douglis, & Frazee, 2003). To support and encourage students' learning outside of the class, the instructor should provide clear instructions, manageable assignments, and relevant activities (Hofmann, 2003). It also encourages them to be prepared to participate in class meetings. To provide the nurturing e-learning environment, it is critical to communicate with an entire course to give students a sense of belonging to the course, as well as to provide an online support and collaboration (Martyn, 2003; Poirier, 2010; Tan, Wang, & Xiao, 2010; Yukawa, 2010**)**. Finally, it is critical to provide periodical course evaluations that can give valuable information in making modifications during and after the course (Collins-Brown, 2011; Tan, Wang, & Xiao, 2010; Yukawa, 2010).

Direction to infuse disability concept in PETE program via e-learning supplement

Although many studies reported admirable cost savings and compatible outcomes in e-learning when compared with face-to-face learning, universities are still struggling with how to make online learning effective (Croft-Baker, 2001). It is critical in the question of how to implement all the characteristics of PE and APE into the online learning environment.

Understanding the content area. This means infusing the content area with the online supplements. For example, when the class focused on how to teach shooting, online supplement should support with modification of equipment and teaching strategies for the student with disabilities. When the class covers behavior management, the online supplement should support the class lesson with examples of behavior managements for students with disabilities, such as picture schedules, reward systems, and token systems. Since the content area covered by online supplements is closely related with the work done in class, it can boost up students' understanding.

Facilitate discussion not only online but also face-to-face. The biggest concern about the online course was interaction with faculty and peers. To promote discussion, the instructor should actively use online chatting, open discussion, or conference calls and should also provide chances to discuss the content covered online face-to face. Since this format would act as a supplement to a class, the instructor can also answer questions in class on a regular base.

Give hands on experiences. The instructor can provide indirect and direct experience using different sources. For the indirect experiences, instructor can provide articles and video clips through uploading the source on the web. They can simply ask students to read or watch and then write short papers. For direct experience, they can observe practicum or do labs that involve shadowing the APE teacher or using a wheelchair to play sports.

To create and implement successful e-learning environment, first of all, university professors should be prepared to meet the challenge of marketing before developing their online course. They can develop a survey with questions about content area in relation to

career goals, and the familiarity of e-learning, all to analyze the capacity of learners. Finally, it is recommended that an institution should conduct the pilot testing on any new course with one or two good students to work out all the bugs.

Summary

Blended learning is not considered a new method but in the past blended learning was comprised of physical classroom formats, such as lectures, labs, books, or handouts. The concept of blended learning is rooted in the idea that "learning is not just a one-time event; learning is a continuous process" (Harwell, 2003, p.6). Blended learning is more beneficial than using only one learning delivery medium because it appeals to those who have a limited chance to study at a specific time and in a specific space. It is believed that blended learning would optimize cost and time (Dean, Stahl, Sylwester, & Peat, 2001).

Most of the recommendations for successful blended course implementation and students' preparation are applicable for or similar to those for online courses suggesting that most of the attention is paid to the online element where students are majorly working at a distance primarily and via online network. Due to the variations in course schedules, routines, and delivery modes it would seem that setting expectations reasonably is of utmost importance so that learners understand how the course works, and whether or not they are equipped for the suitable learning.

Conclusion

This chapter reviewed literature supporting the hypothesis that an infusion approached curriculum could positively impact pre-service teachers' content knowledge and self-efficacy toward including students with disabilities in GPE. The first section reviewed the theoretical framework of the study, Bandura's (1977) self-efficacy theory. Self-efficacy

refers to judgments made by the individual about their own behavior, task completion, or performance (Bandura, 1986). Little research has been conducted in the field of APE based on the Bandura's self-efficacy theory. Hutzler, Zach, and Gafni (2005) were the first who applied self-efficacy theory to APE, and they continued to apply self-efficacy theory. Currently, Block and his colleagues (2013) verified a self-efficacy scale to measure the level of self-efficacy toward teaching students with disabilities in team sports classes. Since self-efficacy is a situation specific and content specific self-perception (Bandura, 1997), self-efficacy will be employed to measure the level of pre-service PE teachers' self-confidence toward including students with disabilities.

Inclusive physical education in Korea was described in the second section. Studies showed that GPE teachers in Korea did not feel comfortable in including students with disabilities, and the GPE teachers tended to refuse to include students with disabilities. The studies (Roh, 2002; Yang & Tack, 2007) showed that the most important factors to determine the GPE teachers' favorable attitude toward teaching students with disabilities was academic preparation. However, PETE curriculum studies (Lee & Choi 2011; Oh et al., 2010) revealed that most of Korean PETE programs offered the APE course as an elective course. It was concluded that even though GPE teachers' difficulties were reported, PETE programs did not provide appropriate training to pre-service teachers toward including students with disabilities.

The third section was about the infusion approach curriculum. In higher education, an infusion approach curriculum has been introduced and faculty agreed to apply the infusion approach curriculum in various fields (Power, 2004). However, faculty have reported difficulty in systematically applying the infusion approach curriculum in

their course because of lack of knowledge, time, and resources. Thus, it is necessary to find an alternative instructional method to apply the infusion approach curriculum in PETE program.

The blended e-learning approach was introduced as an alternative instructional method. Blended learning is an instructional method combining elements of face to face and e-learning courses providing the substantial portion of online content, typically relying on discussion within a planned and pedagogical driven structure (Allen, Seaman, & Garrett, 2007; Aycock, Garnham, & Kaleta, 2002; Laster, Otte, Picciano, & Sorg , 2005).

How do all the literatures presented in the chapter inform the present research questions? Students with disabilities in general school settings have increased over the decade, and studies have shown that not only in-service but also pre-service PE teachers showed difficulties including students with disabilities (Ammah & Hodge, 2006; Block & Obrusnikova, 2007; Hardin, 2005; Hutzler, 2003; Roh 2002; Yang & Tack, 2007). To train pre-service PE teachers toward teaching students with disabilities, an infusion approached curriculum has been introduced (DePauw & God Korp, 1994). However, faculty reported the difficulties in systematically applying the infusion approach curriculum because of constraints such as time, cost, and lack of knowledge (Power, 2004). To control the constraints, the blended learning system could be applied in curriculum to systematically apply the infusion approach curriculum. Since the studies indicated a ubiquitous presence of e-learning in higher education globally (Allen & Seaman, 2008; Kim, Bonk, & Teng, 2009; Kim et al., 2005; Leem & Lim, 2007), the

blended learning, integrating face-to-face course with e-learning resources, could provide successful and doable way to apply infusion approach curriculum in PETE program.

CHAPTER THREE
METHODS

The purpose of the present study is to investigate the effects of two different types of supplements, an e-learning supplement and a traditional handout supplement, in order to increase pre-service teachers' content knowledge and self-efficacy towards including students with disabilities in GPE. The research methodology employed in this study is presented in this chapter, including detailed description of three phases: Phase I, preliminary procedures involved with an e-learning supplement development; Phase II, of pilot study, Phase III described data collection methods; and Phase IV, the procedures for data analysis.

Phase I: Developing supplements

The process used to develop an e-learning supplement will be described below according to Dick, Carey, & Carey's (2005) instructional design model. In the process of developing, offering, and refining e-learning supplements, the need to apply an instructional theory has been recognized (Alonso, Lopez, Manrique, & Vines, 2005). Procedure for developing supplements followed the components of the instructional design model:

- Identifying an instructional goal
- Conducting an instructional analysis
- Identifying entry behaviors and characteristics

- Writing performance objectives
- Developing criterion-referenced test items
- Developing an instructional strategy
- Instructional materials
- Formative evaluation, and
- Summative evaluation

For the instructional design process for this supplement, the nine components in Dick, Carey, and Carey's (2005) model were employed. Since expert review was required to verify the process, professionals who met one of these criteria were invited to review this process: received their terminal degree in APE or pedagogy, works with students with disabilities, teaches APE in higher education, or works as a teaching assistant in APE.

Stage 1. Identifying an instructional goal. Based on Piletic and Davis's study (2010), faculty who teach the Introduction to APE course spend the majority of their lecture time on the following contents: (a) disabilities, (b) instruction and modification strategies, (c) physical fitness and motor skills, and (d) modification. However, it is unclear if content areas covered in the Introduction to APE course match with the actual difficulties that GPE teachers experience in their field. Research by Block, Hutzler, Barak, & Klavina (2013), found that modifying team sports for students with physical, visual, and intellectual disabilities was a challenge for GPE teachers. In addition, studies showed that GPE teachers had more difficulties when they included students with learning/intellectual disabilities than when they included students with physical or sensory disabilities (Clough & Lindsay, 1991; Ward, Center, & Bochner, 1994). As the studies described GPE teachers' difficulties, it could be interpreted that GPE teachers did not receive

adequate training in how to successfully include students with disabilities in the team sports. It also noted that GPE teachers require deep understanding about students with learning/intellectual disabilities (ID). However, there are wide diversities of areas of difficulties within learning disabilities, so it was difficult to describe all the characteristics of learning disabilities in one supplement. As a result, the supplement designed for pre-service teachers primarily focused on understanding the characteristics of individuals with ID and how to successfully provide modification strategies in team sports classes.

Specifically, the goals of the supplement were (a) providing basic understanding of the characteristics of individuals with ID that are necessary for GPE teachers to understand when including students with ID, and (b) identifying appropriate modifications for students with ID in team sports classes, and (c) providing positive effects on self-efficacy toward including students with disabilities. At the end of the course, participants in this study will be able to:

- Identify basic information about ID
- Identify learning, social, and motor characteristics of students with ID
- Identify teaching strategies for students with ID
- Understand basic concepts of modification in equipment, rules, and environment for including students with ID in team sports classes

Stage 2. Conducting an instructional analysis. To determine the appropriateness of the content of the supplement, three experts in APE who met the criteria were initially contacted via e-mail. The survey began with describing the purpose of the survey, described as verifying content to successfully train pre-service teachers toward including

students with ID. Then the survey explained that the experts were to assume they were planning a class to teach pre-service teachers about how to include students with ID into a team sports class. Finally it asked what the most important content the experts would cover to teach pre-service teachers about including students with ID into a team sports class and how to weigh the portion of content in the class.

Via e-mail, three experts in APE were asked to examine and prioritize the overall content to determine which content sections (e.g., environmental modifications, rule modification) were the most important to present to the students. These experts reviewed the content to determine priority (based on percentage totaling 100%) for each subarea (See Appendix III). Based on the experts' review on the priority content area, the following percentage of content spent on each subarea was established for the supplement (see Table 2). By verification from the experts, the PI could finally provide clear standards on how to order the content area and how to make a decision on the proportions of the content areas.

Table 2. Content Priority Survey Results

Content	Expert 1	Expert 2	Expert 3	Total	%
Basic information about ID	15	10	10	30	12
Characteristics of ID	10	10	20	40	13
Instructional strategy	20	20	20	60	20
Equipment modification	20	20	20	60	20
Rule modification	20	20	20	60	20
Environmental modification	15	20	10	50	15
Total	100	100	100	300	100

To keep participants focused and to prevent boredom, the amount of content was limited to 300 words in one section, and total length of all the videos combined was 25 minutes (each video presents 3-4 minutes). To verify if the participants read the text, the participants were asked to answer yes/no questions. Additional yes/no questions and

open-ended questions were followed to verify if the participants watch the videos. Examples of the questions are as below.

> Did you read the text?
> Did you watch the video?
> If yes, please describe at least two rule modifications you observed in the video.

Since the study was designed to enhance the self-efficacy of pre-service teachers' ability to include students with ID, three sources of self-efficacy, mastery experiences, vicarious experience, and social persuasion, were considered when designing the supplement. To provide mastery experience and social persuasion, all participants in the e-learning group were asked to participate in the online discussion. Participants were asked not only to make comments on a case regarding including students with ID but also to give positive comments on other participants' responses on the online discussion board (see Appendix IV). The instructor provided comments that initiated positive remarks on each participant's response as well. The supplement contained videos showing how physical education teachers modify equipment, rules, and the environment to accommodate a student with ID. Watching these videos could provide examples of vicarious experiences for participants (see Appendix V).

A total of eight videos were presented in the supplement. Video 1 described the characteristics of individuals with intellectual disabilities. Specifically, the video detailed the behavior characteristics of Fragile X syndrome regarding autistic behavior, such as being overwhelming with the visual information, melting down, and no eye contact. In teaching strategies, Video 2 and 3 provided examples of peer tutoring. These videos showed an elementary school student helping her peer with intellectual disabilities in physical education class. To show how a student with disability plays a team sports in

actual game setting, a high schooler with Down syndrome who participated in the school football team was shown in Video 4. Video 4 included a coach's interview about how the coach included the student with Down syndrome into his team.

To teach equipment modifications, Video 5 showed how to modify basketball in terms of size and weight, specifically teaching basketball dribble. A PE teacher showed different types of balls as examples of modification strategies. Video 6 and 7 were introduced as examples of rule modifications, one simulating inclusion and the other showing how to adapt a soccer game both with rules and with equipment in an actual game setting. Finally, Video 8 in environmental modification introduced how a hula hoop can be used to modify the environment. For example, the video described how PE teachers used hula hoops in teaching overhand throws and basketball shooting in the PE setting.

Stage 3. Identifying entry behaviors and characteristics. To determine which of the required enabling skills the learners bring to the learning task, participants in both the e-learning and traditional group were asked if they were able to access the Internet and open the link provided by e-mail. Since the satisfaction survey would be conducted online, it was assumed that all participants who successfully completed the task of the supplement and the survey were able to open the emailed link. Additionally, participants in the traditional group were asked by the instructor ahead of the pretest if they could enter the Internet address and open the web. Participants in the traditional group who were not able to use the Internet were trained by the instructor regarding usage of the Internet.

Stage 4. Writing the performance objectives. The component of an objective describes the criteria that will be used to judge the learner's performance. After taking the supplement, participants will be able to understand the characteristics of ID so that participants could provide an appropriate instructional strategy and modifications to students with ID in team sports.

- General information about ID: State definitions, classifications, incidence, cause, and different types of ID and apply this information to participants' students with ID.
- Characteristics of ID: state the characteristics of ID in the learning, social, and motor domains and be able to address students with ID.
- Instructional strategy: identify the teaching strategies for students with ID in communication, practice, and peer tutoring, and demonstrate appropriate instructional strategy for students with ID in team sports units.
- Equipment modification: State how moeify equipment and be able to provide appropriate equipment modification to students with ID in team sports units.
- Rule modification: State how to modify rules for students with ID and be able to provide rule modification for students with ID in team sports units.
- Environmental modification: State how to modify environmental modification for students with ID and be able to appropriately modify environment for students with ID in team sports setting units.

Stage 5. Instructional materials. This stage addressed what materials, for example books or media, were needed for development of the supplement and how to convey the supplement. The choice of instructional material was based on experts'

recommendations. The Primary Investigator (PI) physically met two experts, a professor in APE and an associate professor in pedagogy. In the meeting, the PI asked questions about appropriate instructional materials for the module. Both experts recommended the following chapters in two books: Chapters 7 and 8 of Block (2007)'s *A Teacher's Guide to Including Students with Disabilities in General Physical Education* and Chapter 9 of Lieberman & Houston-Wilson (2009)'s *Strategies for Inclusion: A Handbook for Physical Educators*. Texts were chosen based on the contents of these specific chapters in the books addressing specific and practical modification ideas and examples including of students with ID in team sports. Based on the recommendation from two experts in selecting the instructional material, the PI developed the content of the supplement. At this stage, content of the supplement was reviewed by four experts in APE. The PI sent emails to the five experts in APE. The email started with the purpose of the supplement, to provide information to pre-service PE teacher. These experts also reviewed the videos and verified that the videos were related to the content.

Since this study is identifying the effect of different types of delivery systems, the e-learning group took the supplement via online, whereas the traditional group received a printed-hand out by the instructor.

Stage 6. Designing and conducting the evaluation. The evaluation step can take many forms; in the case of this study, the test was a standard test of content knowledge that matches each of the objectives of this supplement. The content knowledge test was developed by the PI and the major advisor to determine the entry level of all participants. The content knowledge test consisted of fifteen items. Since the amount of content in each section of the supplement was determined by the experts' review in APE in stage 2,

the number of questions on each section was parallel with the level of importance in content. Four experts reviewed the questions and verified the quality of the questions. At the end of the content knowledge test, participants were asked to enter their name to verify their identity. Details regarding the content knowledge test are described in the section on instrumentation.

Stage 7. Summative evaluation. The purpose of the summative evaluation is to study the effectiveness of the system as a whole, and the summative evaluation is conducted after the instruction has passed through its formative stage (Dick & Carey, 1985). Since the supplement was a single module, summative evaluation of this module was replaced by the satisfaction survey of the supplement. Participants in the e-learning and traditional group were asked to take the satisfaction survey. Details of the satisfaction survey are described in the section on instrumentation. Experts in the field of APE and e-learning were asked to critique the readability and clarity of questions. Based on feedback from the experts, questions were revised or adjusted.

Phase II Pilot Study

A study reported that in the blended courses in higher education, online information tends to be overloaded and excessive (Garnham & Kaleta, 2002), so special attention was needed to determine the amount of time for content in the supplement. Since this study is developing an add-on into the regular course, the total amount of time that would be expected to cover the entire supplement would not exceed an hour. After developing the supplement, two pilot studies were conducted to verify the supplement and the instrument, one in the U.S and the other in Korea.

Pilot Study 1

The purpose of this pilot study was to measure the time allotment and system reliability. Pre-service teachers at the University of Wisconsin at La Crosse participated in the pilot study. Four participants completed the e-learning supplement (see Appendix V), and fifteen participants took the self-efficacy survey (see Appendix IX) and the content knowledge test (see Appendix XI) via Questionpro.com. Analysis revealed that the average time to take the supplement was 32 minutes. Time to complete the self-efficacy survey and content knowledge test were 5 minutes and 8 minutes on average, respectively. Therefore, the time to take the complete process did not exceed 50 minutes, also the online of Questionpro.com was stable enough to conduct the study.

Translation Procedure of Pilot Study

The supplement and instruments were translated from English to Korean. The translation procedure of this study followed the suggestion of Banville, Desroisiers, and Genet-Volet (2000). Five experts participated in the translation procedure to verify the Korean version of the supplements and instruments. All experts were born and raised in Korea, have a Bachelor's degree in PETE in Korea, and are fluent in Korean and English. Four experts are assistant professors in PETE program and fluent in English. These four experts received their doctoral degree in APE or PE pedagogy from a university in the U.S (Experts A, B, C, and D). One expert is a doctoral student in APE in the U.S (Expert E). Expert A and Expert E translated the supplement and the instruments into Korean. Expert B and Expert C translated the Korean version to English. Finally Expert E, an assistant professor in APE in Korea, compared the original version and translated version and confirmed that the translated statements were same as the original version.

Pilot study 2

To verify the readability of the translated version of the supplement and the instruments and system stability, five graduate students in PETE program at Kookmin University participated in the pilot study. They took the supplement (see Appendix VI) and instruments (see Appendix X and XII) via questionpro.com. Average time to take the supplement was about forty minutes. All of the students agreed the system was sufficiently stable to contact via the Internet in Korea.

Phase III - Data Collection

In an attempt to present an accurate overview of the participants, this section includes a description of the population and details about the selection of the sample. The target population of this study was pre-service teachers in PE. A demographic survey was included in the pre-self-efficacy survey to confirm if each participant met the criteria to participate in the study. Before the start of data collection, approval was obtained from the Institutional Review Board (IRB) at the University of Virginia (UVA). The following protocol number (2014-0092-00) was reviewed and approved by IRB at the University of Virginia on March 19, 2014 (see Appendix II). Ideally, based on G*Power 3 calculations (Faul, Erdfelder, Lang, & Buchner, 2007), a total of 128 participants were required with the following conditions: Three groups, two measures, effect size of 0.25, alpha level of 0.05, power of 0.80. After recruitment procedure, the total sample size consisted of 75 participants (N =75). Therefore, actual power of the study was modest at .58 with a small effect size of .43. Finally, the sample size for each group was confirmed with 25 participants (n = 25).

Recruiting participants

To initiate the experimental design, recruitment e-mails were sent to the alumni from Seoul National University who currently teach in the PETE program at universities in Korea (see Appendix I). Alumni were asked to forward the recruitment e-mail to other faculty in the PETE program who may be interested in participating. To explain the purpose of the study, the PI then contacted respondents showing interest in participating. The PI examined the syllabus of their team sports course to verify if the purpose of the course focused on how to teach team sports and not how to play a team sport. If the purpose of the course was focused on how to perform a team sport that school was not recruited. Finally, pre-service teachers taking a soccer instruction and team handball instruction course in Kookmin University became participants in this study. The instructor informed participants that participation in this study was voluntary and not associated with course grades.

Individual students who agreed to participate in the study were randomly assigned to one of three groups, either the e-learning group, the traditional group, or the control group. By using randomization, characteristics of the participants that might influence the outcome could be controlled, and this design allowed for determination of whether a treatment made a difference in results (Creswell, 2012). The instructor designated each group with the letter, A, B, or C, which designated the groups A (e-learning supplement group), B (traditional group), and C (control group).

E-learning group. Participants received an email with information about this study and a link to the e-learning supplement (see Appendix VI). By clicking the link, participants could access the website that contains the text, video links, and short questions about the content and the video.

Traditional group. Participants in this group received a traditional printed handout (see Appendix VIII). The content in the handout matched with that of the e-learning group's. Links to videos were included in the handout.

True control group. The true control group did not take any supplement at all. They took the pre-and post- self-efficacy and content knowledge tests. By establishing a true control group, the instructor for team sports recommended to all participants: (a) not to share the links of the e-learning supplements, (b) not to share handouts.

Participation procedures

Participants first were informed by their instructor that they would receive an email inviting them to participate in a study. The instructor provided detailed information regarding the procedure of the study that would help participants decide to participate or not. Those who decided to participate in the study took the pre-self-efficacy survey and the pre-content knowledge test in the classroom. To increase the response rate, printed surveys were provided and participants were asked to submit the pretests to the instructor before they left the classroom. Consents were obtained from all participants at this stage. A Korean version of informed consent agreement approved by IRB was presented to participants prior to initiating the pre-self-efficacy survey (see Appendix X).

After submitting the pre-tests, participants assigned to the traditional group received the printed supplement from the instructor. The instructor sent an e-mail that described the how to access the link to the e-learning supplement and how to participate in the online discussion to participants assigned in the e-learning group. Participants in the e-learning group initiated taking the supplement and participating in the activity by clicking the links. After completing the one- week supplements or receiving information

in the packet, all participants took the post self-efficacy survey and the content knowledge test. Additionally, the participants in the e-learning group and the traditional group were asked to complete the satisfaction survey regarding the usability and the quality of the supplement via Questionpro.com.

Instruments

Content knowledge test. Participants from all the groups took the pre- and post-online content knowledge test. The twenty test items were initially developed to measure the level of content knowledge covered in the supplement.

To verify the content knowledge test, this study employed face validity. Face validity is a very basic form of validity that determines if a question measures what it is supposed to measure (Holden, 2010). Based on the literature that measured teachers' level of content knowledge, the researchers employed face validity to verify the content knowledge test. For example, Sibuyi (2012) examined the teachers' pedagogical content knowledge in teaching quadratic functions in mathematics. To measure the teachers' mathematics teaching knowledge development, a content knowledge test was developed. The face validity from three experts in the mathematics department of a university established the validity of the content knowledge test in Sibuyi's (2012) study. Similarly, Harris (2013) studied the effects of a one-day APE workshop for physical educators. In her study, she employed face validity to verify her content knowledge test that measured the effectiveness of the workshop.

To verify the content knowledge test, this study employed the face validity from four experts in APE and Pedagogy. In addition, the test was piloted on five graduate students who had completed extensive coursework in APE and five college students with

no coursework in APE in order to determine the sensitivity of the test. Wording of test items was adjusted based on both feedback from the professors (see Table 3) and the results of the pilot test (Appendix XI and XII). Based on the results of the content priority survey and the pilot study, fifteen items were assigned as follows:

Table 3. Test Items Based on the Priority of the Contents

Content	Level of Priority (%)	Number of Questions
General information	10	1
Characteristics	12	2
Teaching strategies	20	3
Equipment modification	20	3
Rule modification	20	3
Environmental modification	18	3
Total	100%	15

Self-efficacy survey. The instrument used to measure pre-service physical education teachers' self-efficacy was the Physical Educators' Situational-Specific Self-Efficacy and Inclusion Students with Disabilities in Physical Education (*SE*-PETE-D) (Block, Hutzler, Barak, & Klavina, 2013). Since the *SE*-PETE-D has been validated and is based on Bandura's social cognitive theory, it was adopted and employed as the instrument of the study. The *SE*-PETE-D also provides questions on specific disabilities, such as intellectual disability (ID), physical disabilities (PD), and visual impairment (VI). Since studies have illustrated that PE teachers show different levels of perceived competence regarding different types of disabilities (Hodge & Jansma, 2000; Rizzo & Vispoel, 1991), the part of *SE*-PETE-D specifically related to ID was determined to measure the participants' level of self-efficacy (see Appendix IX and X).

Participants were asked to rate their degree of belief in their ability to perform tasks such as modifying instructions, instructing peers, modifying equipment, and making a safe environment for intellectual disability. Each section of the test began with a

description of a child with ID. This was followed by a series of questions focusing on modifying equipment, rules, and environment in a team sport. Responses ranged from 1 to 5. A score of 1 indicated the respondent had "no confidence" and a score of 5 was akin to "complete confidence." Figure 2 illustrates the format of the score system. Below is an example of the questions on the survey.

1. How confident are you in your ability to make modifications to sports skills if Ashton cannot perform like his peers when you are teaching sport skills?
2. How confident are you in your ability to make the environment safe for Ashton when teaching sport skills?
3. How confident are you in your ability to modify equipment to help Ashton when teaching sport skills?
4. How confident are you in your ability to instruct peers to help Ashton when teaching sport skills?

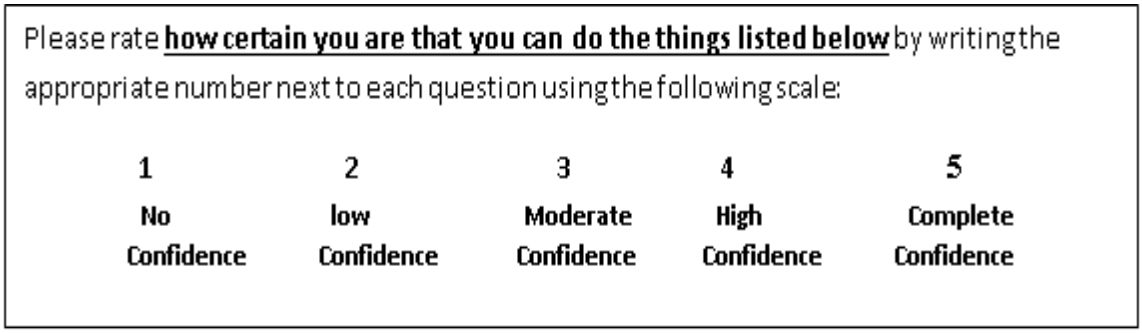

Figure 2. Score system of self-efficacy survey.

Since the *SE*-PETE-D was verified only with the American sample, it was necessary to measure the reliability of the SE-PETE-E with Korean samples. Internal validity was examined using the SPSS ver.21 (Analyze-Scale-Reliability analysis). Cronbach's alpha was observed as a measure of internal consistency, which indicates

how accurate a measure of scale reliability is. The high value for alpha provides strong evidence that the scale in question is unidimensional. Cronbach's alpha is not a statistical test, but it indicates coefficient reliability. Results indicated that the alpha coefficient for the sixteen items was .881. Since a reliability coefficient of .70 or higher is considered acceptable in most social science research, the items had relatively high internal consistency. Also, Cronbach's alpha on all sixteen items was well above the .80 threshold. As the initial Cronbach's alpha was above .70, no item was deleted.

Satisfaction survey. Student satisfaction can be defined as the student's perception of the college experience and perceived value of the education received while attending an educational institution (Astin, 1993). Most college students spend considerable time, money, and effort in obtaining a quality education and should perceive their postsecondary educational experiences as being of high value (Knox, Lindsay, & Kolb, 1993). Satisfaction is an important intermediate outcome (Astin, 1993, p. 278) in that it influences the student's level of motivation (Chute, Thompson, & Hancock, 1999; Donohue & Wong, 1997), which is an important psychological factor in academic success (American Psychological Association [APA], 1995). Satisfaction is also good predictor of retention (Astin, 1993; Edwards & Waters, 1982). End-of-course surveys administered to distance learners can give evaluators valuable student satisfaction information that can be used to improve the course or program (Chute, Thompson, & Hancock, 1999). Lewis (1995) proposed a renowned system usability scale, the Post-Study System Usability Questionnaire (PSSUQ). The PSSUQ approaches system usability via a multitude of aspects, ranging from system function, information and interface quality to users' satisfaction level. In a rather compact questionnaire design of

nineteen questions, the evaluation covers the standards of effectiveness, efficacy, and satisfaction (Lewis, 1995). The PSSUQ is proven to be of good reliability and validity (Lewis, 2002), and is therefore suitable for the evaluation of system usability. Responses will range from 1 to 7. A score of 1 indicates "strongly disagree" and a score of 7 is akin to "strongly agree." Figure 3 illustrates the format of the score system.

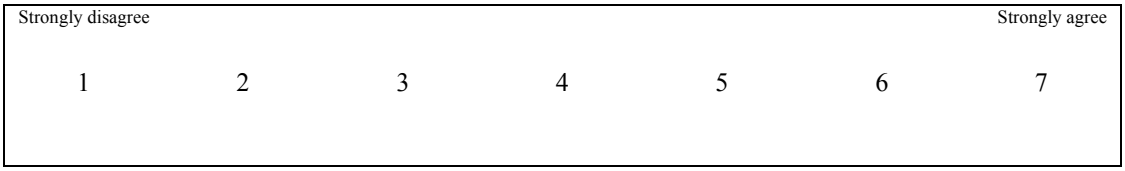

Figure 3. Score system of PSSUQ.

To measure the level of satisfaction toward two different types of supplements, the satisfaction survey was developed based on the PSSUQ. At the end of the survey, additional questions were asked regarding the quality of videos. The main purpose of additional questions was to verify whether participants watched the videos and if watching the videos was helpful in understanding the content. A satisfaction survey for the traditional group was also developed by modifying the questions of the PSSUQ. It was necessary to employ the PSSUQ for the traditional group to parallel the satisfaction survey of e-learning group. The PSSUQ questions were modified to measure the level of satisfaction with the traditional handout. For example, the following is a question on the PSSUQ for the e-learning group: "Overall I am satisfied with the system." The modified version for the traditional handout group was as follows: "Overall I am satisfied with the format of the handout."

After questions were modified by the PI, the surveys for both the e-learning group and the traditional group were sent to the experts for verification. Experts gave feedback to the PI after they reviewed the PSSUQ. Three experts reviewed the surveys for both

groups. One reviewer noted two questions were similar, so one question was deleted. The final satisfaction survey consisted of twenty-eight multiple choice questions for the e-learning group. Specifically, eight questions are related to satisfaction on the overall e-learning module, and twenty questions reflect satisfaction on videos. The satisfaction survey for the traditional group consisted of 26 multiple choice questions, six questions measuring overall satisfaction on the handout and 20 questions measuring satisfaction on the videos (see Appendix XIII and XIV). The survey for the e-learning group had two more questions than that of the traditional group because of questions regarding the error message and usability of the website (see Appendix XV and XVI) were included.

Phase IV: Data Analysis

An experimental design was employed in this study using *SE*-PETE-D and the content knowledge tests. The fundamental question addressed in this investigation is whether the type of delivery system of supplements would allow a different level of impact on pre-service teachers' perceived self-efficacy and level of cognitive knowledge.

After collection of data from the three groups, data were analyzed using a statistical software package (SPSS ver.21). Mixed effects ANOVA was used to analyze the data. This decision was made because there will be three groups (control = 0, e-learning = 1, traditional = 2), which served as the between subjects measures and two repeated factors measure. Once data were entered into SPSS ver.21, assumptions for mixed effects ANOVA were tested.

Descriptive statistics

Descriptive statistics were conducted for normality, homogeneity of variance, additivity, and sphericity to test the assumptions for ANOVA (Stevens, 2009). The results of the

satisfaction survey for both the e-learning group and the traditional group were analyzed with descriptive statistics.

t-test

The *t*-test was conducted to see the difference in the levels of satisfaction toward the supplement between the e-learning and the traditional group. The level of satisfaction was analyzed in each section of the satisfaction survey, satisfaction on the supplement, and video.

Mixed effects ANOVA

Mixed effects ANOVA was used to analyze collected data. The dependent variables were the content knowledge test and the self-efficacy survey, and the independent variables were time (pre- and post-test) and treatment (e-learning, traditional supplement, and control group). The mixed effects ANOVA analyzed between-group differences, within-group differences, and interaction, allowing the treatment effect and time effect to be considered. Between-subject factors (e-learning vs. traditional group) assumptions were tested for normality (Shapiro-Wilk) and homogeneity of variance (Levene, 1960). Within-subject factors (measures of self-efficacy and time) assumptions were tested for additivity (Tukey) and sphericity (automatically met or assumed). All assumptions were tested using an alpha level set as 0.05. Additivity will be examined at alpha level 0.05. Results and conclusions were drawn based on these statistical analyses.

CHAPTER FOUR
RESULTS

The purpose this study was to determine whether the APE supplement impacted pre-service teachers' perceived self-efficacy and the level of content knowledge toward including students with ID in team sports class. More specifically, three groups of pre-service teachers were randomly assigned to provide different types of the supplement (i.e., the e-learning group, the traditional group, and the control group) regarding modification strategies toward including students with ID in team sports.

In this chapter, the results of these investigations are presented. The chapter is organized into five sections: (a) demographic statistics, (b) statistical assumptions, (c) examination of perceived self-efficacy (research question 1), (d) examination of the level of content knowledge (research question 2), and (e) analysis of the level of satisfaction toward the supplement (research question 3).

Demographics Statistics

Initially 75 participants were recruited to participate in the study. Criteria for participating in the study included the following: (a) the student had not taken an introductory APE course and (b) the student was majoring PETE program. Participants were asked these two questions in the demographic questions at the end of the pre-self-efficacy survey. With the exception of a single individual in the control group, no participant had taken the APE course. Therefore, data from this particular individual were not included. The final sample in the study was composed of 74 participants (n = 53

males, and n = 21 females). All participants (N = 74) were pre-service teachers currently majoring in PETE and taking team sports courses such as soccer instruction and team handball instruction in Kookmin University located in Korea. The ethnicity of all participants was Korean. The ages of the participants in the sample were as follows: M = 19.44 , SD =.757, range = 18 to 21, with 5.3% of participants age 18, 55.3% of participants age 19, 27.6% age 20, and 10.5% of participants age 21. All participants were in either their first or second year in the college; 82.9% of participants were in their first year and 15.8% were in their second year.

Participants' experience in teaching students with disabilities was investigated in this section. Results indicated that none of the participants had a GPE internship or practicum in K-12 setting. Most participants had no experience with students with disabilities in PE or community sports. Two participants in the study had previous experience in dealing with physical disabilities. Furthermore, roughly 10% of participants (n = 7) had personal experiences with people with disabilities. Two participants answered they have a family member with ID. One participant reported he had someone at school with a visual disability. Four participants answered that they had someone at school with a physical disability.

Testing Statistical Assumptions

Prior to conducting the primary data analysis, three data sets were examined for missing values. To increase the response rate, all the participants who wanted to participate in the study were asked to complete a pre- and post-*SE*-PETE-D as well as the content knowledge test, which they handed to the instructor right after the team sports class. Evaluation indicated no missing values in pre-and post-tests of the *SE*-PETE-D and

content knowledge tests. However, in the satisfaction survey conducted via online, twenty-one participants in the e-learning group and sixteen participants in the traditional group completed the survey.

The two primary dependent variables of this study (i.e., the *SE*-PETE-D score and the content knowledge test score) were examined for their compliance with the underlying assumption to be conducted. All variables were examined separately for three groups: e-learning group (n = 23), traditional group (n = 25), and control group (n = 24). The assumptions included (a) outliers, (b) normality, (c) homogeneity of variance, and (d) additivity.

Outlier. Outliers are anomalous values in the data. Outliers tend to increase the estimate of sample variance, thus decreasing the calculated F statistics for the ANOVA, and lowering the chance of rejecting the null hypothesis. The boxplot and normal Q-Q plot were examined with the presence of outliers in the data. No outlier was observed in the dataset.

Normality. Univariate normality was examined separately for each group through evaluation of skewness and kurtosis, histograms, and the Shapiro-Wilk test.

In *SE*-PETE-D, skewness and kurtosis values were well within acceptable limits (<1.0) for pretest and posttest, the pretest (skewness = .302, kurtosis = .419), the posttest (skewness = .277, kurtosis=.548). The Shapiro-Wilk test revealed that normality of the *SE*-PETE-D in pretest and posttest of all the groups did not violate the level of normality ($p > .05$).

Skewness and kurtosis. Skewness and kurtosis for the content knowledge test were examined. Results indicated that skewness and kurtosis of the pre-content knowledge test

were within the acceptable limit at skewness = .850, kurtosis = .205. However, those of post-content knowledge test were beyond the acceptable limit at skewness = -1.070, kurtosis = .535. Based on the histogram of the post- content knowledge test, which showed that the graph was slightly skewed and the level of skewness was moderate (< 1.5), it is confirmed that the data were approximately symmetric. The Shapiro-Wilk test indicated that pre- and posttest of the content knowledge test violated the level of normality ($p < .05$). However, the Shapiro-Wilk test is overpowered in that it could reject normality more frequently than it actually occurs (Lomax, 2007), and Stevens (1996) revealed that the violation of the normality assumption is not a major problem with a large sample size ($n > 30$). Therefore, data transformation was not required. Regarding the histogram of dependent variables through all the groups, it appears visually to be reasonably normal. Therefore, normality was not violated for the content knowledge test in all the groups.

Homogeneity of variance. Homogeneity of variance means that the variance within each of the population is equal (Lomax, 2007). Lavene's test (Lavene, 1960) was used to determine if groups had equal variance ($p > .05$). In the SE-PETE-D, Lavene's test indicated equal variance for the pretest ($p = .080$) and posttest ($p = .250$). Result of Lavene's test on the content knowledge test revealed the equal variance for both pretest ($p = .130$) and posttest ($p = .883$).

Additivity. This assumption basically states that subjects and levels don't interact with one another. This means the difference between the groups is consistent for both pre and posttest. Tukey's test of additivity indicated that self-efficacy data followed an additive

model (F [1, 71] = .553, p = .468 (p > .05)). Additivity was met for the content knowledge test data with F (1, 71) = .076, p = .783 (p > .05).

Sphericity. Mauchly's test of sphericity indicated that sphericity was met for both the SE-PETE-D scores (p = 1.00) and the content knowledge test scores (p = 1.05).

RQ1. Does an APE supplement have an impact on the self-efficacy of pre-service teachers including students with ID into team sports classes?

Ahead of reporting major findings, results of participating in the online discussion are reported below. Twenty-three of 25 participants in the e-learning group participate in the online discussion. The data for the two participants who did not participated in the online discussion were excluded from further analyses. Discussion is considered to engage students better with the course content and encourage them to share and gain knowledge from each other. In this study, the discussion had another purpose, providing social persuasion. Social persuasion is one of the sources of self-efficacy in Bandura's social learning theory (Bandura, 1997). Social persuasion involves support and encouragement from individuals, such as peers or colleagues. They might tell the individual what a great job they are doing or give them some resources for including students with disabilities and encourage them to try it in their classroom. Participants in the e-learning group participated in the online discussion regarding including students with ID. Participants were asked not only to answer the questions but also comment on other students' answers. Most participants commented on the other's answers as 'Great idea' or' 'I agree with your idea.' It is questionable how these simple comments on the answers could impact perceived self-efficacy. It should be noted that Bandura (1997) said social persuasion alone is limited in its' ability to permanently improve self-efficacy.

A 3X2 mixed-effects ANOVA was employed to investigate the changes in perceived self-efficacy across the different types of supplement (i.e., e-learning group, traditional group, and control group). The Bonferroni adjustment was calculated by dividing the alpha level by the number of tests being performed (i.e., pre- and posttest). The Bonferroni adjusted the level of significance at (.05/2) = .025. Any test that results in a *p*-value of less than .025 would be considered statistically significant.

Results of this analysis revealed a statistically significant main effect between the pre- and posttest with a large effect size; F (1, 71) = 23.438, $p < .001$, partial eta-squared=.581. Main effect for different groups were found to be statistically significant with a small effect size; F (2, 71) = 3.953 p = .023, partial eta squared = .099. Results indicated that the interaction of time and groups was statistically significant with a large effect size (F [2, 71] = 24.286, $p < .001$, partial eta-squared = .403) (see Table 5 and Figure 4). The null hypothesis, pre-service teachers' self-efficacy toward including students with ID in the GPE class before and after taking an APE supplement will have no change, was rejected. In other words, using an APE supplement proved to be effective to influence self-efficacy.

Since statistically significant results were noted, post hoc tests were conducted. Tukey HSD was selected to compare the means to each of the other groups. This test compared the e-learning group to the traditional group; the e-learning group to the control group, and the traditional group and the control group. Tukey HSD multiple comparisons of means provide a correction factor to the pairwise comparison with a 95% family-wise confidence level (Lomax, 2007). Results indicated that the mean score for the e-learning group was significantly different than that for the control group at p = .024. However,

significant differences were not observed in self-efficacy between the e-learning group and the traditional group (p = .102); and the traditional group and the control group (p = .842). Table 5 and Figure 4 indicated a summary of ANOVA results.

Table 4. Summary of Group Means and Standard Deviations ($N = 72$)

Group	Subject	Level	Mean	SD
E-learning	Self-efficacy score	Pretest	2.940	.334
(*n*=23)		Posttest	3.515	.345
	Content knowledge score	Pretest	5.76	1.53
		Posttest	8.36	1.439
Traditional	Self-efficacy score	Pretest	2.927	.291
(*n*=25)		Posttest	3.104	.429
	Content knowledge score	Pretest	5.87	1.98
		Posttest	7.125	1.569
Control	Self-efficacy score	Pretest	2.899	.351
(*n*=24)		Posttest	3.019	.299
	Content knowledge score	Pretest	6.11	1.50
		Posttest	6.692	1.435
Total	Self-efficacy score	Pretest	2.921	.344
(*N*=72)		Posttest	3.211	.417
	Content knowledge score	Pretest	5.920	1.666
		Posttest	7.386	1.626

Table 5. Mixed Model ANOVA Summary Table for Self-efficacy Score

Source		**SS**	**df**	**MS**	**F**	**p**	**Effect size**
Between							
Group	A	2.020	2	1.010	3.953	.023	.099
Error	S(A)	18.392	72	.255			
Within							
Group	B	3.167	1	3.167	50.681	.000	.581
Time X Group	AXB	1.543	2	.772	24.286	.000	.403
Error	BXS(A)	2.287	72	.032			

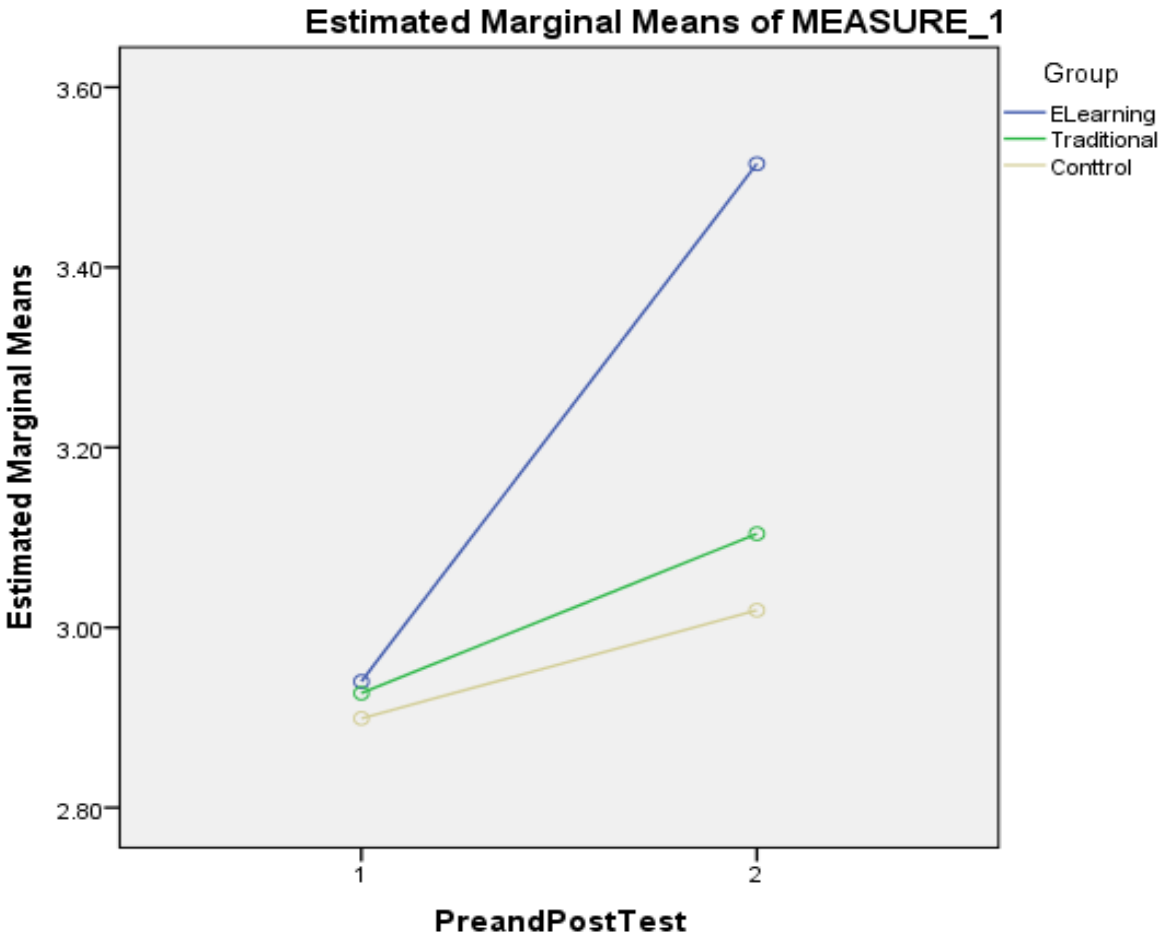

Figure 4. Slot self-efficacy survey.

RQ2. Does an APE supplement have an impact on pre-service teachers' level of content knowledge for including students with ID in the team sports?

To test the change in the level of content knowledge across the type of supplement (e-learning, traditional, and control group), a 3X2 mixed effect ANOVA was executed. A Bonferroni adjustment accounted for multiple tests at p =.025 (.05/2 = .025).

The analysis did reveal a significant main effect of time (F [2, 71] = 7.023, p < .000) with a large effect size (partial eta squared =.663). However, the test between subjects effects showed that the content knowledge score between groups were not statistically significant with a small effect size (F [2, 71] = 1.420, p = .248, partial eta squared = .038). Results revealed that interaction of time and group were statistically significant with a medium effect size (F [1, 71] = 50.681, p < .001, partial eta squared = .394). A summary of ANOVA results are presented in Table 6. Figure 5 shows the interaction effect. Since results indicated the main effect for time and interaction of time and groups were statistically significant, the null hypothesis that pre-service teachers' content knowledge score for including students with ID into team sports have no change following an APE supplement was rejected. In other words, using an APE supplement proved to positively impact the level of content knowledge regarding including students with ID.

Since a statistically significant result was found in time and interaction of time and groups, follow-up tests were explored. One-way ANOVA with simple effect analysis was conducted to reveal the difference between pretest and posttest on each group. In the e-learning group, a significant difference between pretest (M = 5.76, SD = 1.535) and posttest scores (M = 8.360, SD = 1.439) was observed (F [1, 48] = 18.149, p < .001,

Cohen's d = 1.77). In the traditional group, results revealed a significant difference between pretest (M = 5.875, SD = 1.985) and posttest scores (M = 7.125, SD = 1.569) (F [1, 48] = 6.474, p = .014, Cohen's d= 1.017). However, there were no significant differences between pretest (M = 6.115, SD = 1.505) and posttest scores (M = 6.692, SD = 1.435) in the control group (F [1, 48] = .578, p = .451, Cohen's d= .031).

Table 6. Summary Content Knowledge Test

Source		SS	df	MS	F	*p*	Effect size
Between							
Group	A	12.638	2	6.317	1.420	.248	.038
Error	S(A)	157.923	72	4.449			
Within							
Time	B	81.570	1	81.570	50.681	.000	.663
Time X Group	AXB	26.910	2	13.455	23.387	.000	.394
Error	BXS(A)	41.423	72	.575			

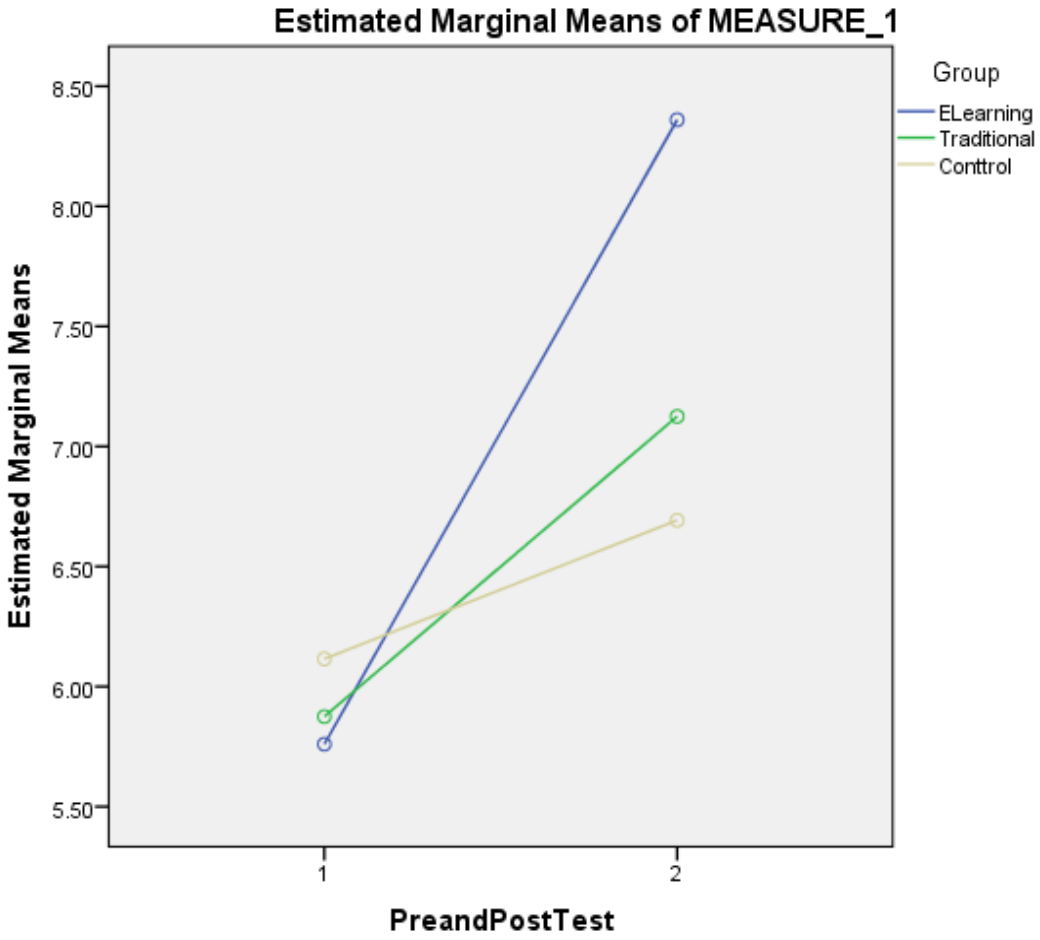

Figure 5. Slot content knowledge test.

RQ 3. Are participants satisfied with taking an APE supplement in terms of usability, quality of content, and video? Do participants in the e-learning group feel satisfied with the e-learning supplement? Do participants in the traditional group feel satisfied with the supplement delivered with the printed hand-out?

The levels of satisfaction on two different types of supplements, an e-learning supplement and a traditional supplement, were examined in this research question. To measure the level of satisfaction toward the supplement, the satisfaction survey consisted of two parts. The first part of the survey measured overall satisfaction toward the supplement, such as the usability of the supplement and quality of the content. The main purpose of the second part was verifying that participants watched the videos and were satisfied with the quality of the videos. Responses of the survey ranged from 1 to 7. A score of 1 indicated the respondent "strongly disagreed" and a score of 7 indicated "strongly agreed."

Analyses of satisfaction were divided into three parts. Part one showed the result of descriptive statistics of the satisfaction survey for the e-learning group. Part two showed the level of satisfaction of the traditional group**.** Finally, part three compared the satisfaction level between the e-learning group and the traditional group with the paired *t*-test. Since the content of the two different types of supplements were equivalent, comparing the level of satisfaction toward each type of the supplement could help determine which format of the supplement pre-service teachers preferred.

Descriptive statistics for the satisfaction survey of the e-learning group. Ninety-one percent of participants in the e-learning group completed the survey.

In system accessibility, a total of eight questions were asked to measure the level of satisfaction in function and usability of the system. The first question measured participants' satisfaction with the system function on opening the supplement link, picture links, and video links. Results indicated participants were satisfied with the system function with a mean at the level of agreement (M = 6.12, SD = 1.07). Next, participants agreed that they could effectively complete the tasks in the e-learning supplement (M = 5.24, SD =.70). The mean of the question on the satisfaction level about the interface was 6.08 (M = 6.08, SD =.83).

On the questions regarding the error message and system recovery, all the participants answered not applicable, which means that the e-learning system did not cause system error while the participants were taking the e-learning supplement. There were two questions regarding the quality of the content. Participants agreed that the content of the supplement was easy to understand (M = 5.98 SD = .75). They also agreed that the content was clearly organized (M = 5.74, SD = .91). Finally, the mean of the overall quality of the e-learning module was 5.24 (M = 5.24, SD = .81). Table 7 presents the summary of the satisfaction scores of the e-learning group.

The second part of the survey focused on the quality of videos. The first question in this part of the survey was designed to determine if participants truly watched the videos. Note that in order to receive as honest an answer as possible, the following statement preceded this section on video analysis: "*It is ok if you choose not to watch the videos, and there would be no penalty on your grade*." The level of satisfaction on the videos measured the helpfulness in understanding the content, the quality of video, and the effectiveness to take the post-test. These questions were asked on each section.

Table 7. Overall Satisfaction Score Summary of E-learning Group

Part	**Item**	**Mean**	**SD**	***n***
System Usability	System function	6.12	1.07	21
	Easy to complete	5.24	.70	21
	Interface	6.08	.83	21
	Error Sign	N/A		21
	Easy to recover	N/A		21
Content Quality	Easy to understand	5.98	.75	21
	Organization of information	5.74	.91	21
Overall Quality		5.24	.81	21

N/A- Not Applicable

In the section Characteristics of ID, 15 participants answered that they watched the video. Participants were satisfied with the quality of the video (*M* = 5.73, *SD* = .92). Means for helpfulness in understanding the content and that of the quality of video were 6.5 and 5.7 respectively (*M* = 6.5, SD=5.7). However, participants answered that the video in this section was not effective when taking the posttest (*M* = 3.06, *SD* = .93). There were three videos in the section on teaching strategies. Thirteen participants answered that they watched all three videos. One participant answered that he/she watched one to two videos. Participants agreed the videos were helpful in understanding the content area in the section (*M* = 5.4, *SD* = .48). They were also satisfied with the quality of videos (*M* = 6.47, *SD* = .49). They agreed the videos were effective in helping them on the post-test (*M* = 4.8, *SD* = .65).

There was one video in the section on equipment modification. Fifty-six percent of participants answered they watched the video. They answered that they watched the video in this part and agreed that the video was helpful in understanding the content (*M* = 5.83, *SD* = 1.20). Quality of the video was rated as 6.47 (*M* = 6.47, *SD* = .50). Participants also agreed the video was helpful when taking the posttest (*M* = 4.73, *SD* = .57).

In rule modification, 35% answered they watched two videos, and 4% (one participant) answered that he/she watched only one video. On the question regarding the quality of the video, participants answered the videos were helpful to understand the content (*M* = 5.83, *SD* = .56) and were satisfied with the quality of the video (*M* = 6.14, *SD* =.44). The mean of the question on the effectiveness to take the posttest was 4.73 (*M* = 4.73, *SD* =.92).

There was one video on environmental modifications, and 30% of participants answered they watched this video. They agreed that the video was helpful in understanding the content area ($M = 5.83$, $SD = .56$) and they were satisfied with the quality of the video ($M = 6.14$, $SD = .44$). Participants agreed the video was effective to take the posttest ($M = 4.00$, $SD = .92$). The satisfaction survey summary is presented in Table 8.

Table 8. Video Satisfaction Score Summary of the E-learning Group

Part	**Item**	**Mean**	**SD**	***N***
Video: ID Characteristics	Help to understand	6.5	.65	15
	Quality of video	5.73	.92	
	Help to posttest	3.06	.93	
Video: Teaching Strategies	Watched 3 videos			12
	1-2 videos			1
	Help to understand	5.4	.48	13
	Quality of video	6.47	.49	
	Help to posttest	4.8	.65	
Video: Equipment M.	Help to understand	5.87	1.20	13
	Quality of video	6.47	.50	
	Help to posttest	4.73	.57	
Video: Rule M.	Watched 2 videos			8
	1 video			1
	Help to understand	5.11	.59	9
	Quality of video	6.00	.67	
	Help to posttest			
Video: Environmental M.	Help to understand	5.83	.56	7
	Quality of video	6.14	.44	
	Help to posttest	4	.92	

Note. **Scale 1 to 7**

Descriptive statistics for the satisfaction survey of the traditional group

Participants in the traditional group were asked to complete an online satisfaction survey to investigate the level of satisfaction regarding the handout. Sixty-five percent of completed the satisfaction survey. A total of 26 questions were included in the survey. Six questions related to quality of the hand-out, and twenty questions addressed the quality of videos. Participants were not satisfied with overall quality of the handout (M = 3.51, SD = .81).

Regarding the quality of the handout, mean of the question on the quality of the copy of the handout was 6.12 (M = 6.12, SD = 1.07). This mean score indicates that participants agreed the quality of the copy, which includes indicating letters and pictures, was good. Participants disagreed that the information on the handout was effective to complete the task (M = 3.24, SD = .70). However, they agreed the display of the handout was pleasant (M = 4.43, SD = .91).Participants agreed that content of the handout was easy to understand (M = 5.08, SD = .75). On the question about the organization of the content, the mean score was 4.43 (M = 4.43, SD = .91). A summary of satisfaction survey results are presented in Table 9.

On the question about the quality of video, 12% in the traditional group who completed the satisfaction survey indicated they watched first video only (Video 1), and did not watch the next seven videos (Video 2, 3, 4, 5, 6, 7, and 8). The mean score of helpfulness to understand the content was 6.0 (M = 6.0, SD =.65), and the mean for the quality of video was 5.73 (M = 5.73, SD =.92). However, three students answered that the video was not helpful in answering the post questions (M = 3.06, SD =.93). Satisfaction

survey results indicated that participants in the handout group did not watch the video. The satisfaction survey results are presented in Table 10.

Table 9. Summary of Satisfaction Survey of the Traditional Group

Part	**Item**	**Mean**	**SD**	***n***
Quality of hand-out	Quality of print	6.12	1.07	21
	Easy to complete the task	3.24	.70	21
	Display	4.52	.83	21
Content Quality	Easy to understand	5.08	.75	21
	Organization of information	4.43	.91	21
Overall Quality		3.51	.81	21

Table 10. Video Satisfaction Score Summary of the Traditional Group

Section	**Item**	**Mean**	**SD**	***n***
Video: ID Characteristics	Help to understand	6.0	.65	3
	Quality of video	5.73	.92	
	Help to posttest	3.06	.93	

Mean differences between the e-learning group and the traditional group

To see the difference between the e-learning group and the traditional group in the satisfaction level, four questions were analyzed with paired-samples t-tests to reveal the difference in the level of satisfaction between two groups.

1. E-learning group: Overall, I am satisfied with how easy it is to use this e-learning module.

   Traditional group: Overall, I am satisfied with how easy it is to use the information in the hand-out.
2. E-learning group: The content of the e-learning module was easy to understand.

   Traditional group: The content of the hand-out was easy to understand
3. E-learning group: Information was effective to complete the tasks and scenarios using this e-learning module.

   Traditional group: Information was effective in helping me complete the tasks and scenarios.
4. E-learning group: The organization of information was clear.

   Traditional group: The organization of information was clear.

Results of the first question revealed that participants taking the e-learning supplement ($M = 5.214$, $SD = .893$) had significantly higher satisfaction levels than those taking the traditional supplement ($M = 3.649$, $SD = .745$) ($t\,[13] = 8.901$, $p < .001$, Cohen's $d = 1.903$). On the second question, results indicated the e-learning module ($M = 5.357$, $SD = .633$) was more effective than the traditional supplement in completing the task of the supplement ($M = 2.79$, $SD = .699$). ($t\,[13] = 9.527$ $p < .001$, Cohen's $d = 3.849$). However, satisfaction on the quality of content was not statistically significant

between the e-learning (M = 5.142, SD = .662) and the traditional group (M = 5.286, SD = .611) (t [13] = .922, p = .435, Cohen's d = .0226). On the question regarding satisfaction level for the organization of content, the e-learning group (M = 5.357, SD = .750) had statistically higher satisfaction levels than the tradition group (M = 3.643, SD =.297) (t [13] = 6.450, p < .001, Cohen's d = 3.004).

CHAPTER FIVE

DISCUSSION

The purpose of this study was to investigate the effects of an APE supplement in a PETE course on pre-service teachers' self-efficacy and level of content knowledge toward including students with ID into team sports classes. The major findings of this study were: (a) pre-service teachers' self-efficacy increased following the APE supplement, (b) the APE supplement positively affected pre-service teachers' level of content knowledge regarding inclusion in team sports, and (c) participants in the e-learning group showed higher satisfaction levels regarding the supplement than those in the traditional group did. This chapter includes a discussion of the results of this study including pertinent literature, implications for practice, and suggestions for future research.

Discussion

RQ1: Does an APE supplement have an impact on the self-efficacy of pre-service teachers toward including students with ID into team sports classes?

Findings revealed pre-service teachers' perceived self-efficacy improved after taking the supplement. And a significant difference between groups was observed. Based on the results, the null hypothesis was rejected. Increased self-efficacy scores over time were consistent with the findings of Hodge et al. (2004). Although the participants in the e-learning group showed a greater increase in their self-efficacy scores compared to either

the traditional or the control group, there was no significant difference in self-efficacy scores between the e-learning group and the traditional group in the post-hoc test.

Participants in both the e-learning group and the traditional group took the same APE supplement in terms of content; only the delivery system was different. Participants in the e-learning group received some advantages. Since Bandura (1997, 1994) suggested that self-efficacy is directly affected by four sources (i.e., mastery experience, vicarious experience, social persuation, and physiological status), the activities watching videos, and the online discussion activity were designed to provide vicarious experiences and social persuasion to participants in the e-learning group. Unfortunately, there were no differences in increases in perceived self-efficacy between the e-learning and traditional group, although both groups showed a significant improvement compared to the control group.

Participants in the e-learning group could access the videos by clicking the links, whereas the participants in traditional group had to type the addresses of the links. Participants in the e-learning group obviously had advantages in terms of access time. This difference in convenience could prompt more participants in the e-learning group to watch the video than those in the traditional group. This was in fact the finding in this study: 65% of participants in the e-learning group watched the videos. In contrast, only 12% of participants in the traditional group answered they watched only one video listed in the handout. That means 88% of the traditional group did not have the vicarious experience of how to include students with ID into team sports. It could be hypothesized that using online methods made it easier to deliver instructional video.

For example, Zhang, Zhou, Briggs and Nunamaker (2006) studied the effectiveness of video in different class formats. They provided two different types of video (i.e., non-interactive video and interactive video) into two different types of class settings (i.e., e-learning and traditional class). The results showed that the traditional group with non-interactive video had the lowest learning outcome and satisfaction with regard to the videos, whereas participants who took the interactive videos in the e-learning class showed the highest achievement and the highest satisfaction in contents that provided by video. Since this study examined the non-interactive videos in different class settings, it is necessary to consider this aspect of the result. The result of the study showed that even the same video in a different setting could provide different outcomes and satisfaction toward videos. Specifically, videos in e-learning settings could have more effectiveness in learning outcomes and higher satisfaction than videos in a traditional setting. This aligned with the results of this study that provides empirical evidence that e-learning could be better suited for delivering educational video than a traditional format is.

Participants in the e-learning group also participated in an online discussion. Online discussion is believed to better engage students with the course content and encourage them to share and gain knowledge from each other (Mazzolini & Maddison, 2003). In this study, discussion had another purpose: providing social persuasion. Social persuasion is another source of self-efficacy (Bandura, 1997). Social persuasion, also known as verbal persuasion, is support and encouragement from others. It occurs when an individual receives feedback on his or her work regarding his or her ability to perform a specific task (Bandura, 1997). Social persuasion includes having support and

encouragement from individuals, such as peers or colleagues. Others might tell an individual what a great job he or she is doing, or offer resources for including students with disabilities and encourage the individual to try it in their classroom. Participants in the e-learning group participated in the online discussion regarding including students with ID into team sports class. Participants not only asked and answered questions but also commented on other students' answers. Unfortunately, most of the participants comments on the others' answers were very brief, including answers such as "Great idea" or "I agree with your idea." The instructor of the team sports participated in the discussion to provide feedback on participants' comments. However, the instructor was not fully engaged in the discussion but rather only gave simple feedback on participants' comments. Perhaps a richer discussion among participants would have occurred if the moderator was more engaged and actively encouraged greater participation in the online discussion. Studies supported that the role of the moderator or "contingencies" in the online discussion is a critical element in making the online discussion more effective (Chen 2004; Hara, Bonk, & Angeli, 2000).

For example, Hara, Bonk, and Angeli (2000) studied how participants could be more engaged in an online discussion. The supplemented online discussion was provided using an instructional method within a traditional face-to-face graduate level course for 15 weeks. To participate in the study, each participant were asked to sign up at least once for the role of "starter" who initiated weekly discussion by asking questions related to the readings and the "wrapper" who summarized the weekly discussionson and readings. Additionally, the instructor was strongly engaged in discussions to purposefully create a learning environment. The role of the instructor in the discussion was not only

encouraging student interaction but also recognizing student participation when they resulted in significant comments in discussion. Results revealed that student comments were significantly dependent on the guidance of discussion facilitator and instructor. The study showed the importance of the discussion starter and the instructor to foster students' engagement in the online discussion. In the present study, both participants and the instructor were passive on providing feedback, and no one served as a moderator. Without a moderator who could create more engagement and thought-provoking questions for participants to respond, it is no wonder participating in the online discussion was not enough or not valued enough to provide social persuasion to participants in the e-learning group.

Chen (2004) also pointed out that instructors can use and manage online discussions at the message level to promote critical thinking, facilitate discussion of controversial topics, and reduce status effects. Interestingly, Chen and Chiu's (2008) study also determined that online discussion messages that disagreed with an earlier message were more likely to elicit responses unlike face-to-face discussion. Since the online discussion in this study only allowed positive comments, this environment may decrease the students' active participation in the discussion. It could be concluded that the quality of the online discussion could vary by the moderator's engagement and format on the discussion. These factors must be considered in designing the online discussions to keep the attention of learners, demonstrate key points, clarify misunderstandings, and provide clear and concise feedback. The activities provided by the supplement in this present study focused on two sources of self-efficacy (i.e., vicarious experience and social persuasion). However, the most powerful source of improving self-efficacy is

mastery experiences (Bandura, 1994). It is critical to investigate if mastery experience can be provided via e-learning.

Mastery experiences consist of an individual's past performances of the task or skills (Bandura, 1994). That means if an individual completed a task previously, he or she will feel a higher self-efficacy to perform the same task again. In this present study, the online discussion was expected to provide some small level of mastery experiences. However, it turned out the online discussion was not successfully implemented to provide mastery experiences because of lack of a moderator and limitation in feedback (i.e., only positive feedback allowed). Future supplements should be adjusted to allow for application of some of the modifications into the PETE class. This would allow the inclusion of mastery experiences and would more likely promote improved self-efficacy.

One possible way to provide a mastery experience through an e-learning tutorial could be online simulation. Medical education has a long history of simulation-based education. The traditional model of surgical discipline is "learning by doing" (Okuda et al., 2009), and such simulations have a connection to personal mastery experiences with success (Bandura, 1997). Since "learning by doing" is the traditional model of surgical discipline, the simulation-based education is prevalent in medical education to provide lifelike experience and decrease medical errors or risk (McGaghie, Issenberg, Petrusa, & Scalese, 2010). The most advanced form of simulation is the realistic patient simulation that allows handling of complex and high risk clinical situation in a lifelike setting (Okuda et al., 2009). Research suggests trainee surgeons who experienced a wide range of clinical conditions via an education simulation program gradually build up the necessary operative skill (Okuda et al., 2009; Ziv, Small, & Wolpe, 2000).

Since studies revealed that simulations could allow trainees exposure to a variety of clinical presentations and atypical patterns as well as crises in medical situations (Okuda et al., 2009; Ziv, Small, & Wolpe, 2000), it can be applicable to provide simulations to pre-service teachers to handle wide variations (i.e., type and severity of disabilities, age, situation, and class type) of their future PE classes. Since a lack of APE practicum and APE courses was observed (Piletics & Davis, 2010), it is obvious that pre-service teachers have limited experiences in working with students with disabilities. This limited experience could be negatively correlated with mastery experiences working with students with disabilities. To provide experience, simulation programs providing virtual PE class should be developed and implemented into PETE programs. This can provide mastery experiences to pre-service teachers in student-based experiences in classroom settings.

The importance of academic preparation for working with students with disabilities was pointed out by several studies (Hutzler, Zach, & Gafni, 2005; Rizzo and Kirkland, 1995). For example, one study (Morrison, Wakefield, Walker, & Solberg, 1994) supports the idea that the self-efficacy of teachers could be increased via appropriate intervention strategies. Similary, Hutzler, Zach, and Gafni (2005) also pointed out that knowledge acquisition about children with special needs and methods for including them is expected to increase perceived self-efficacy. Since results revealed that taking an APE supplement could be more helpful in increasing self-efficacy than no APE supplement, this study aligned with the underlying hypothesis of these studies that the more advanced stages in teacher training are expected to increase levels of perceived self-efficacy.

RQ2. Does an APE supplement have an impact on pre-service teachers' level of content knowledge including students with ID in the team sports?

Hodge et al. (2004) explained that participants in his study stated a need for academic preparation in adapting equipment, developing lesson plans, and meeting the needs of students with disabilities. The APE supplement in the present study was developed based on these needs for academic preparation, and to evaluate whether significant improvement on pre-service teachers' level of content knowledge occurred after teachers took an APE supplement. Fifteen questions were asked to measure the level of content knowledge. The score was one point per question for a total of 15 possible points.

Results indicated an increase in content knowledge for both groups. The APE supplement resulted in a positive increase in the content knowledge scores of pre-service teachers from pretest and posttest in the e-learning group and the traditional group. Results of follow-up tests confirmed that posttest score was significantly higher than pretest score in both e-learning group and traditional group. However, there was no significant difference observed in the control group.

Findings were supported by previous research. Harris's (2013) study examined the effectiveness of a one-day APE workshop and observed improved content knowledge scores following the workshop. Similarly, Armour and Yelling (2004, 2007) found that physical education teachers' knowledge increased as the result of a professional development program. In the present study, two treatment groups took the supplement with two different types of delivery systems, online and a traditional supplement. Results of this study found no difference between the two groups in content learning. Literature that examined the difference in content knowledge between online and traditional

education settings supports these results. For example, Goldberg, Russell, and Cook's (2003) meta-analysis of several studies concluded that the majority of studies analyzed found "no significant difference" between e-learning and traditional delivery methods in academic achievement as measured by a content knowledge score. Because the studies found no significant difference between e-learning and traditional delivery method, it is important to see what factors influence learning outcome in online education. Lapointe & Gunawardena (2004) revealed positive relationship between instructor's feedback and learning outcome. Similarly, Eom, Wen, & Ashill (2006) revealed that students' learning style and instructor's feedback could affect perceived learning outcome.

Instructor feedback to the learner is defined as what information a learner received about the learning process and achievement comments by the instructor (Butler & Winne, 1995), and it is "one of the most powerful components in the learning process" (Dick & Carey, 1990, p. 165). Since the blended e-learning can provide two different types of feedback from the instructor via face-to-face and web-based systems, the blended e-learning environment could provide better feedback to the students. Since the APE supplement is designed for PETE courses; for example, as per individual/team sports, sports psychology, or exercise physiology, the instructors may have limited knowledge regarding the APE content. As instructors' feedback turned out to be a critical source in academic achievement in e-learning, APE professionals should be invited when the APE e-learning supplement is being presented in PETE courses. In doing so, giving specific feedback could be achieved effectively.

A student's learning style should enhance the learning outcome. Curry's study (1983) observed diverse dimensions in learning style of each learner. A popular typology

for “the physiological dimension of the learning style is VARK (Visual, Aural, Read/write, and Kinethestic)” (Drago & Wagner, 2004, p.2). Drago and Wagner (2004) described VARK as follows: Visual learners prefer demonstrations and can learn through description. Aural learners learn by listening, read/write ones do best by taking notes or by reading difficult material, and kinesthetic learners learn best by doing. The fundamental assumption of learning styles is that different students learn differently, and a higher level of student satisfaction and learning outcome can be expected only when the online learning module fits a learner’s learning style (Eom, Wen, & Ashill, 2006). Since each learner has his/her own learning style, there cannot be a universal e-learning instructional model meeting each learner’s learning style. Therefore, e-learning should implement different types of activities.

As mentioned, participants in the e-learning group participated in additional activities, watching the video and participating in the online discussion. However, there was no significant difference observed between two groups. In this study, participants watched the video with simple description (e.g., a peer tutoring example or a girl with Down syndrome). Lawson, Model, Houlette, and Haubner (2006) studied how to enhance students’ learning by watching educational videos. They tested a procedure designed to enhance psychology students' learning from education videos. Results revealed that students who watched an educational video with special instructions had significantly higher scores in the follow-up quiz than students who watched the video without the special instruction. Since the videos in the present study did not provide special instruction, it is recommended that future lessons and supplements provide instructions

and explanations about the videos to boost the level of understanding regarding the content.

The online discussion was required for participants in the e-learning group. According to Blackmon (2012), online discussion can promote interaction between peers and increase academic achievement. However, no significant difference was observed between the e-learning group and the traditional group in the content knowledge test. As noted above, lacking a discussion moderator and limited participation in the discussion might be one of reasons that lead to the ineffectiveness of the online discussion. Additionally, it is also critical to consider characteristics of Korean students. Traditional relationships between students and a teacher can be described by Confucianism, as a relationship between the young and the old. It is reflected in the school system as "hierarchical" (Lee, 1998). Lee (1998) described hierarchical relationship as follows: "This hierarchy is strongly infused in classroom environment. Commonly, people in higher positions have more authority, which means students have to obey the teacher and they tend to be passive. Conventionally, teachers have authority in the classroom." (Lee, 1998, p. 240) Thus, interaction patterns depend on the hierarchical position. Lee, Frasor, and Fisher (2003) studied teacher-student interactions in Korean senior high school classrooms and observed the youth-elder relationship in society of "directing teachers and obeying students" in the classrooms.

Even though most of participants in this study were freshmen in college, and the instructor teaching the team sports in this study was an assistant professor, just one year's difference between senior high school students and college freshmen does not significantly change the relationship between teacher and students. As Lee, Frasor, and

Fisher's (2003) study revealed, the relationship between students and the instructor did not go beyond "directing teacher and obeying students." The instructor's participation in the online discussion of this study may influence participants' passive participation into the discussion. To design successful online discussions, cultural characteristics should be considered, and Korean students may prefer to have a moderator who is younger than the professor or someone with lower authority, such as a teaching assistant or a graduate student.

It would also be necessary to consider the different types of discussion formats to determine which would impact the level of content knowledge. In studies regarding online discussion (Althaus, 1997; Bliuc, Ellis, Goodyear, & Piggott, 2010), the combination of face-to-face and computer-mediated discussion provided a superior learning environment compared to traditional discussion or online discussion only. Similarly, Larkin-Hein (2001) reported that online chatting or online forums could provide in-depth understanding on the content. To facilitate the acquisition of understanding content, it is necessary to find an appropriate type of online communication that meets the characteristics of the course.

RQ3: Are participants satisfied with taking an APE supplement in terms of usability, quality of content, and video? Are participants in the e-learning group satisfied with the e-learning supplement? Are participants in the traditional group satisfied with the supplement and printed handout?

Student satisfaction is an important indicator of the quality of learning experience (Moore & Kearsley, 1996; Yukseltyrk & Yildirim, 2008). Previous studies confirmed that there would be no considerable difference between e-learning and traditional face-to-face

classroom learning in terms of learning outcomes (Allen & Seaman, 2008; Biner, Bink, Huffman & Dean, 1995; Brown & Liedholm, 2002).

In this study, the level of satisfaction on two different types of supplements, an e-learning supplement and a traditional supplement, were examined with responses on a 7-point scale (1 = I strongly disagree to 7 = I strongly agree). Participants in the e-learning group answered they were satisfied with the usability and quality of content. The means of these questions were higher than four points, which means that participants were satisfied with the usability and quality of content. On the questions regarding the videos, nine out of twenty-three participants in the e-learning group who watched the video were satisfied with the quality of video. Specifically, they agreed the videos were helpful in understanding the content. However, they did not agree watching videos was helpful in taking the posttest. This may explain why a significant difference in self-efficacy was observed between groups. Since watching videos was helpful in understanding the content, participants in e-learning increased their level of perceived self-efficacy. However, there was no difference in content knowledge scores between groups. This aligned with the results of the satisfaction survey in which participants answered that the videos were not helpful in the posttest.

Participants in the traditional group took a satisfaction survey about the traditional printed handout. Fifteen participants out of twenty-five completed the survey. Participants were satisfied with the quality of print and the display of the handout. However, they did not agree that the supplements helped them to complete the task (e.g., watching videos). As mentioned above, participants in the e-learning group obviously had advantages in terms of accessing time. This difference in convenience could be one

of the primary reasons to prompt more participants in the e-learning group to watch the video than those in the traditional group. On the questions about the content quality, participants agreed the content was easy to understand, and they were satisfied with the organization of information. However, only three participants answered they watched the first video out of six listed videos, and they agreed the video was helpful in understanding the video and image quality of the video. That means more participants in the e-learning group watched the videos, which seemed to help them understand the content. Thus, the online system was a more effective way to provide videos to participants. However, we do not know whether online is always effective to promote participation in activities.

Janniro's (1993) study compared two different versions of course, the traditional classroom version of a course and a revised and technology-delivered version of the course. Differences that were found might have been due, at least in part, to course design rather than the use of technology. For technology to be effective, it should be delivered via well-designed instruction in a manner that facilitates learners' motivation and achievement (Brown & Ford, 2002). While technology can supply learning opportunities, it is a teacher's careful planning and instructional strategies that contribute to student academic achievement and satisfaction in e-learning (Yukselturk & Bulut, 2007). However, Johnson and Aragon (2002) pointed out that many e-learning courses were simply modeled after traditional forms of instruction instead of a design meeting the unique capabilities of e-learning environment. Most recently, Reiser and Dempsey (2012) suggested a framework for future instructional design and technology. This framework outlined three basic roles for instructional design and technology professionals (Reiser & Dempsey, 2012): 1) design by assignment, 2) master designer and 3) design researcher.

Design–by–assignment teams design instruction and activities considering multiple perspectives of content and cultures that can empower the instruction. Then the master designers apply technology based on the developed instruction. Finally, design researchers test the instructional tool that involves installing and monitoring tools and systems and requiring technical levels of expertise. To create successful e-learning modules, these experts should cooperate at all stages of instructional design. However, this present study applied Dick, Carey, and Carey's (2005) instructional design model and did not utilize these three basic roles for instructional design.

To develop a successful APE e-learning supplement, Reiser and Dempsey's (2012) instructional design and technology can be applied by following the key steps. First, a designer-by-assignment team would design and develop instruction and activities considering the characteristics of APE contents and a local culture. Second, master designers would apply technology based on the developed instruction and activities. They should also decide when and where specific content would be introduced. Finally, design researchers would test and validate tools for specific use with technology teams. Since one of the most important factors that influence the success of e-learning is instructional design (Winfield, Mealy & Scheibel, 1998), the instructional design should be carefully developed to meet the characteristics of culture, learners, and the course subjects (e.g., individual/team sports, or motor development).

Multiple *t*-tests were conducted to see the difference in level of satisfaction between the e-learning group and the control group. The only difference in the supplement between the e-learning group and the traditional group was the delivery system. However, the e-learning group showed a significantly higher satisfaction level on

the supplement compared to the traditional group. Since participants in the e-learning group could easily complete the activities via links, it was not surprising to see the difference in the level of overall satisfaction between two groups. This result also showed the affective domain of the participants on the format in delivery system. Results from the present study align with similar studies. For example, Rockinson-Szapkiw, Courduff, Carter, & Bennett and collegues (2013) compared university students' learning using two different types of textbook, electronic textbooks and traditional print textbooks ($N = 538$). However, the mean scores indicated that students who chose the e-text book had significantly higher perceived satisfaction than those who chose to use traditional textbook. Results of Rockinson-Szapkiw, Courduff, Carter, & Bennett's (2013) study also indicated that there was no difference in students' cognitive learning between using the e-textbook and traditional textbook. This supports the finding of the present study that participants felt no difference in understanding the content between e-learning and traditional supplement. Clearly, students prefer to take online materials. Since online texts and other online materials have advantages in terms of cost and it can be suggested that providing educational materials via online could be recommended in university courses.

In quality of the content, *t*-test confirmed that there was no difference between two groups. That means both groups agreed that they were satisfied that the content of the supplement was easy to understand. However, participants in the e-learning group had a higher satisfaction level regarding the organization of content than those in the traditional group. Even though content was organized exactly parallel for both groups, participants in the e-learning group had reported higher satisfaction than the traditional group. Since

the e-learning supplement was organized based on the sub-content, new content was opened in new webpage. This may have refocused the attention of participants on taking the supplement. Bernasconi and Galizzi (2012) studied the satisfaction levels for online textbooks as related to students' learning. Results revealed that students commented favorably about the online textbook, but did not show improved performances. The present study aligned with these results. Even though participants had higher satisfaction levels, there was no difference in content knowledge scores between groups.

These findings suggest that while this online technology increased students' satisfaction, that does not necessarily result in improved achievements on the content. In blended learning environments, various factors aew associated with student satisfaction asuch as flexibility, computer expertise, usefulness, convenience, self-directedness, accessibility, availability of good resources, flexibility, diverse assessment methods, instructor availability, active communication and interaction, and a variety of activities and assignments (Sahin & Shelley, 2008; Ausburn, 2004; El Mansour & Mupinga, 2007; Ginns & Ellis, 2007; Welker & Bernardino, 2006).

For example, Ginns & Ellis (2007) studied the quality of blended learning, specifically how campus-based students' experiences of the online parts of their courses are associated with their experience of the course as a whole ($N = 127$). To figure out these correlation, scale scores were created as Good e-teaching, Good e-resources, Student interaction, and Appropriate workload. Results revealed that students' satisfaction level on each of the proposed scales correlated with the level of quality of the e-learning materials and activities ($p < 0.05$). Results of the present study also showed correlation between good e-resource and student interaction and students' satisfaction. For example,

participants in the e-learning group could easily access the video by clicking the link, and results indicated that 70% of participants in the e-learning group watched the videos. In addition, a large number in the e-learning group also participated in the online discussion as an activity. In contrast, only three participants (12%) in the traditional group answered they watched the first video, and no one watched the next five videos listed on the supplement. Since watching the video and participating in the discussion could be assumed to be good e-resources and student interaction, these activities worked as advantages for the satisfaction of the e-learning group. Finally, based on results of the satisfaction survey, it is recommended that faculty must consider factors such as usability, accessibility, convenience, and the availability of good resources when implementing blended learning into their courses.

Implications for practice

Results of the current study offer severa; implications for future teacher training programs.

First, findings of this study have implications for the development of APE e-learning programs not only for pre-service but also in-service teachers. Since this present study showed a one-hour APE supplement made a significant difference in improving perceived self-efficacy and content knowledge, by providing additional activities along with the supplement, the PETE program could finally appropriately train future PE teachers for including students with disabilities. For example, innovative methods for providing vicarious experiences should be explored. For example, pre-service teachers can watch how in-service teachers are including students with disabilities via real-time video calls (i.e., Skype or Facetime). This real-time video call could be extended to a

discussion with in-service teachers. In this way, pre-service teachers can benefit from two sources of self-efficacy, vicarious experiences and social persuasions. Difficulties in including students with disabilities are also observed in the teaching of in-service PE teachers. Developing e-learning workshops that introduce current issues in inclusion, new teaching strategies, and new equipment could be a great opportunity for improving teaching practices of in-service teachers.

Second, to integrate effective e-learning into the PETE programs or the APE workshops, faculty should be trained in developing and using e-learning programs. Pajo and Wallace (2001) investigated the barriers of faculty in developing e-learning. Factor analysis identified three groups of factors: personal barrier (lack of knowledge, skills, training, and time), attitude barriers (no faith in technology, unwillingness to work with technology), and organizational barriers (inadequate technical support, hardware, software, and instructional design). To overcome the barriers, faculty development programs should be conducted in both technology and the pedagogy of e-learning. With a positive attitude and training, faculty can create effective e-learning programs with diverse activities that meet the characteristics of APE.

Results indicated that online activities, watching videos, and participation in an online discussion increased pre-service teachers' perceived self-efficacy toward including students with disabilities. Since each disability has great variability in terms of severity and characteristics, it is critical to observe as many different types of students with disabilities as possible before pre-service teachers go out to the field. Video clips should be used to provide training on the different types of disabilities, teaching strategies and modification strategies. Another reason to develop an APE supplement was the lack of

faculty specialized in APE. Based on Piletic and Davis's (2010) study, only 48% of the faculty teaching the Introduction to APE course had their terminal degree in APE.

To implement a well-designed e-learning supplement, faculty training in course design and creation should be provided by universities. Rovai, Ponton, Derrick, and Davis (2006) indicated that faculty should not be expected to know how to design and deliver e-learning courses and will require a significant amount of training before doing so. This faculty training may include workshops with specialists such as instructional designers, graphic designers, multimedia specialists, editors, and librarians. It is necessary for adequate training of faculty to be provided to enable instructors to create and implement effective e-learning courses. Also faculty workload and compensation for the time required in creating online courses should be considered by the college administrators.

Future Research

The e-learning module was created based on the instructional design model (Dick, Carey, & Carey, 2005). To figure out the best fit instructional theory that meets the characteristics of APE, Different instructional theory should be applied in developing the APE e-learning. Since this present study only provided only text and videos as an APE supplement, applying different supplement format need to be implement into PETE program. Especially, it is suggested that researchers conduct the different types of e-learning supplements such as video-recorded lecture or synchronous lecture could be applicable.

Different types of activity should be included in the supplement to enhance social persuasion. Participants in the e-learning group participated in the online discussion. Online chatting can be provided to promote rich interaction with peers and the instructor. Specifically, creating activities to boost each source of self-efficacy; mastery experience, vicarious experience, social persuasion, and physiological status. The strongest source to effect self-efficacy, mastery experience, could be provided by activities such as video simulation to determine if the mastery experience effect on perceived self-efficacy of pre-service teacher including students with disabilities.

Faculty is a key component of instructional delivery. Since the quality of faculty primarily depends on the qualification of the faculty teaching in e-learning. It is necessary to conduct a study how to conduct the faculty training and effectiveness of faculty training toward developing effective e-learning education.

Limitations

This study was conducted with a number of limitations. First, the study was conducted using a modest, small sample size ($N = 73$). The targeted sample size was $N = 128$, but because participants were able to self-select into the study, many individuals who attended the team sports class chose not to participate in the study. It would be useful to replicate the study on larger scale to increase actual power.

Second, participants were recruited from one university in Korea. To determine the impact of the APE supplement, it is necessary to investigate data from participants from diverse cultural and regional backgrounds. Then the findings could be generalized to all the pre-service teachers majoring in PETE.

Third, it is important to note that the e-learning supplement used in this study was a single module, and the days between pretest and posttest might not have been long enough. Even though increased self-efficacy and content knowledge were observed, it is not clear that these gains will remain over time due to the lack of a retention test.

Finally, it is important to note that participants were from one university in Korea. Participants each brought levels and perceptions (both positive and negative) of experience in working with students with disabilities, which were factors beyond the control of the researcher.

Conclusion

This study investigated the impact of an APE supplement in a PETE course on the perceived self-efficacy and level of content knowledge toward including students with ID in the team sports class. Major findings of this study were (a) taking an APE supplement could provide a significant positive impact on pre-service teachers' self-efficacy toward including students with disabilities, (b) the level of content knowledge regarding inclusion increased following the APE supplement, (c) participants who took the e-learning supplement showed higher satisfaction levels toward the supplement than those who took the traditional supplement.

Since the studies indicated that both pre- and in-service teachers had difficulties including students with disabilities into GPE classes (Hardin, 2005; Haycock & Smith, 2011; Kowalski & Rizzo, 1996; Meegan & MacPhail, 2006; Rizzo & Kirkland, 1995), appropriate training must be provided for successful inclusion. The results of this study indicated that taking an APE supplement could make an meaningful increase in pre-service teachers' perceived self-efficacy and level of content knowledge. This study

could be a basis for future development of more effective e-learning resources to train both pre- and in-service teachers. Further study should be conducted to confirm the findings of this study and extend the use of the systematic APE supplements to train future PE teachers toward including students with disabilities into GPE classes.

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APPENDIX I . Recruiting Email

Dear Faculty of the Physical Education Teacher Education Program:

Hi. My name is Eun Hye Kwon, and I am a doctoral student at the University of Virginia in Adapted Physical Education. This email is an invitation to my study, which is focused on the effectiveness of e-learning supplements in Physical Education Teacher Education (PETE) programs.

I would like to invite undergraduate students who are PETE majors in your program in this study. This study is about how to infuse disability concept into PETE program. I will provide a 30-minute long adapted physical education supplements to your pre-service PE teachers via online or a paper-based handout. The content of the supplements focus on teaching strategies and modification strategies for students with intellectual disabilities in team sports classes. Also, your pre-service PE teachers will be asked to complete a 15 minute survey and a 5 minutes knowledge test once at the beginning of the study and once at the end of the study. For your information, additional information, such as consent form, sample content knowledge test and self-efficacy survey is also attached. Participation by your students is completely voluntary. If you choose your students to participate in the study, I will send you a link to the supplement, content knowledge test, and self-efficacy survey.

Feel free to forward this invitation to other faculty members who teach team sports to pre-service PE teachers. Thank you for your time and consideration.
Any thoughts, feedback, and suggestions would be greatly appreciated as well. If you have further questions/concerns, please contact me at:

Eun Hye Kwon
8025 Ohio Dr. # 14306
Plano, TX 75024
434-218-8112
Ehk2v@virginia.edu

Best,
Eun Hye Kwon

APPENDIX II. IRB Approval

Project Title: Introducing Disability Concepts into Physical Education Teacher Education Program through E-learning Supplements

Informed Consent Agreement

Please read this consent agreement carefully before you decide to participate in the study.

Purpose of the research study: The purpose of the study is to examine the effectiveness of an e-learning supplement in Physical Education Teacher Education program.

What you will do in the study: As participant in the study you will either (a) enroll and take E-learning supplements provided by the researcher focused on inclusion of students with disabilities in physical education class, or (b) not enroll in E-learning supplement. Regardless if you are enrolled or not enrolled to take E-learning supplements, you will complete a self-efficacy survey, and a content knowledge test at the very beginning, and at the end of the study. If you are enrolled to take E-learning supplement, you will complete the system usability Questionnaires at the end of the study.

Time required: The participants will take E-learning supplements 15 to 20 minutes a week for 2 weeks. Total time of taking supplements will be approximately 40 minutes. At the beginning and end of the study you will be ask to complete a self-efficacy survey and content knowledge test, which will take about 15 minutes each. The system usability Questionnaires will take 15 minutes. These surveys and test will be completed online.

Risks: There are no anticipated risks in this study.

Benefits: There are no direct benefits to you for participating in this research study.

Confidentiality: The information that you give in the study will be handled confidentially. Your name will appear on the survey but then be given a number code. We need to keep your name to match the three surveys you will complete. Once you complete all three surveys your name will be replaced with a code number. All data analyses and oral/written presentation of the data will only use the code numbers and not your name. All surveys will be kept in a locked file in the researcher's office, and he will be on the only person with access to this file. Once all data has been collected and transferred to a computer file, the actual paper and pencil surveys you completed will then be destroyed.

Voluntary participation: Your participation in the study is completely voluntary. Choosing not to participate in this study will not affect your class grade in this or any other class.

Right to withdraw from the study: You have the right to withdraw from the study at any time without penalty prior to final data analysis (when names will be deleted and only code numbers will be used). If you choose to withdraw prior to final data analysis (after you complete E-Learning supplements), then the surveys and tests you completed will be destroyed. It will not be possible to withdraw once data has been converted to code numbers, as your data will be unidentifiable.

How to withdraw from the study: If you want to withdraw from the study, simply email the investigator, and he will destroy any surveys you have completed. There is no penalty for withdrawing.

IRB-SBS Office Use Only		
Protocol #	**2014-0092**	
Approved	from: **3/19/14**	to: **3/18/15**
SBS Staff		

Project Title: Introducing Disability Concepts into Physical Education Teacher Education Program through E-learning Supplements

Payment: You will receive no payment for participating in the study.

If you have questions about the study, contact:
Researcher:
Eun Hye Kwon
Kinesiology Program, University of Virginia
210 Emmett Street, S. Box 400407
Charlottesville, VA 22904
Telephone: (434) 218-8112
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Faculty Advisor's Name:
Martin Block, PhD
Kinesiology Program, University of Virginia
210 Emmett Street, S. Box 400407
Charlottesville, VA 22904
Telephone: (434) 924-7073
meb7u@virginia.edu

If you have questions about your rights in the study, contact:
Tonya R. Moon, Ph.D.
Chair, Institutional Review Board for the Social and Behavioral Sciences
One Morton Dr. Suite 500
University of Virginia, P.O. Box 800392
Charlottesville, VA 22908-0392
Telephone: (434) 924-5999
Email: irbsbshelp@virginia.edu
Website: www.virginia.edu/vpr/irb/sbs

Telephone: (434) 924-5999
Email: irbsbshelp@virginia.edu
Website: www.virginia.edu/vprgs/irb

Agreement:
I agree to participate in the research study described above.

Signature: _____ **Date:** _____
You will receive a copy of this form for your records.

IRB-SBS Office Use Only		
Protocol #	**2014-0092**	
Approved	from: **3/19/14**	to: **3/18/15**
SBS Staff		

APPENDIX III. Content Priority Survey Results

1. Overall content area

Content	Expert 1	Expert 2	Expert 3	Total	%
Basic information about ID	15	10	10	35	12
Characteristics of ID	10	10	20	40	13
Instructional Strategy	20	20	20	60	20
Equipment modification	20	20	20	60	20
Rule modification	20	20	20	60	20
Environmental modification	15	20	10	55	15
Total	100	100	100	300	100

2. Section I. Basic information about ID

Goal	Content	Sub-content	Details	Expert 1	Expert 2	Expert 3	Total	%
What is ID?	Definition	By different agency (AAIDD, ADA)		45	20	40	105	35
	Classification	By IQ level		5	15	5	25	8
		By WHO		5		5	10	3
		By AAIDD		5		5	10	3
	Incidence of ID	Statistics		5	5	5	15	5
	Cause of ID	Prenatal -Chromosomal Disorder - Heredity -Environmental Peri/post natal		5	15	10	30	10
	Different types of ID	Down Syndrome	Cognitive function Social attribute Motor Development	10	15	10	35	12
		Fragile X Syndrome	Cognitive function Social attribute Motor Development	10	15	10	35	12
		Fetal Alcohol Syndrome	Cognitive function Social attribute Motor Development	10	15	10	35	12
Total				100	100	100	100	300

3. Section II. Characteristics of ID

Content	Sub-content	Details	Expert 1	Expert 2	Expert 3	Total	%
Learning	Short-term memory	Difficulty to remember in long-term	10	10	10	30	10
	Difficulty in generalizing	Difficulty in understanding abstract concept 'as fast as you can' or/and 'as far as you can'.	10	10	10	30	10
	Problem with complex	Hard to understand the complex questions	10	10	10	30	10
Social	Difficulty in interacting with others	Poor eye contact Difficulty relating to others	10	10	10	30	10
	Selective attention	Only focus based on preference	15	10	10	35	12
	Unaware of others in early age, when they become aware, others become a distraction.	Focus on behavior of others but not what is taught	10	10	10	30	10
Motor	Hypotonia	Low muscle tone, improvement observed in later age.	10	10	10	30	10
	Difficulty in fine motor skills	More difficulty in fine motor skills than gross motor skills	5	10	10	25	8
	Balance and coordination issue	Lack of precision or smoothness in performance	10	10	10	30	10
	Coordination issue	Lack of precision or smoothness in performance	10	10	10	30	10
Video							
Total			100	100	100	300	100

4. Section III. Teaching strategies for ID

Content	Details	Expert 1	Expert 2	Expert 3	Total	%
Communication	Shorter sentence	5	10	10	25	7.5
	Not too many cues in one time	5	10	10	25	7.5
	Use gesture and demonstrations with verbal cues	10	10	10	30	10
	Repeat directions and have student repeat direction back.	10	10	10	30	10
Practice	Extra practice trials	10	10	10	30	10
	More feedback after the trial	10	5	5	20	7
	How to rehearse and practice	10	10	5	25	8
	Extra time to master skills	5	5	5	15	5
	extra cues, picture schedule for , provide specific and positive feedback often, eliminate the distractions	10	10	10	30	10
Peer tutoring	Provide support to student with more mild ID	10	10	10	30	10
	Provide more natural cues in inclusion	5	5	5	15	5
	Train peers how to assist the student with ID, as the peers become more comfortable	10	5	10	25	10
Video						
Total		100%				

5. Section IV. Equipment modification

Equipment modification	Content	Details	Expert 1	Expert 2	Expert 3	Total	%
What is equipment modification	Definition		40	10	10	60	19
Example	Volleyball	Different types of ball Different sizes of ball Different colors of ball	20	30	30	80	27
	Basketball	Different types of ball Different sizes of ball Different colors of ball	20	30	30	80	27
	Softball	Using T Different types of ball Different size of the ball Different sizes of the bat	20	30	30	80	27
Video							
Total			100	100	100	300	100

6. Section V. Rule modifications

Rule modification	Content	Expert 1	Expert 2	Expert 3	Total	%
What is rule modification?	Definition	40	20	20	80	28
Soccer	Pass the ball without being defended Different score system (Advantage to student with ID)	15	20	20	55	18
Softball	Hit off T/ground Vary the number of strokes Time extension Two bases instead of three base Peer runner/guide	15	20	20	55	18
Soccer	Hand used for protection No heading Different point system Undefended Free shooting Peer placing Ball on the ground for kicking	15	20	20	55	18
Basketball	Walking without dribble Pass the ball to student with ID before shooting Different point system Free shooting Increase the number of players	15	20	20	55	18
Video						
Total		100	100	100	300	100

7. Section VI. Environmental modification.

Environment Modification	content	Expert 1	Expert 2	Expert 3	Total	%
Definition	What is environmental modification?	40	10	25	75	25
Baseball	Vary the distance between bases Allow hitting the base while student with ID should bit the base with Use the guardrail Cones next to bases	20	30	25	75	25
Basketball	Use box or trash can for goal Modify court size Cones as boundaries	20	30	25	75	25
Soccer	Extend the goal area Modify field size Smooth surface	20	30	25	75	25
Video						
Total		100	100	100	300	100

APPENDIX IV. Online Discussion

Online Discussion – English Version

Please read the case carefully and answer the questions. To complete participating in the discussion, please give positive comments on your peers' remarks.

Case

Mr. Ellis, the newly hired physical education teacher, was discouraged. "whenever peter and Jasmine come to physical education, I just get this tight feeling across my chest. Yes, I know I should be able to accommodate them and I 'd like to be able to, but I just don't feel qualified, so I get nervous. Peter has been diagnosed with Fragile X syndrome and Jasmine has Down syndrome. That's as much as I know. I get an aide when they come to the gym with their 30 classmates. What am I supposed to do with that information? On one hand, I am glad they're in the physical education class with their buddies. On the other hand, I wish I had better ideas of how to work with them. Do I change an approach? My curriculum? What if the other students get angry or bored? What if I don't have time for all of the others? With all the different levels and learning steps, I wish I had been a little better prepared.

Descriptions about Students

-Peter is a 9-year-old boy with Fraxile X syndrome. He has behavior issues such as rocking and making odd sounds while the students are sitting and listening. Peter has difficulties to participate in any activities and follow directions.
-Jasmin is a 9-year-old girl with Down Syndrome with mild mental regardation. She has been included in GPE since kindergarten. She has difficulties in balance, coordination and fitness. Jasmin easily loses her attention and discourages with unsuccessful trails in activities.

Questions)
What is the primary issue in this case?
What are some of factors that contributed to this case?
Please describe the teaching strategies and modification strategies for Peter and Jasmin in first week of basketball unit.

Online Discussion- Korean Version

아래의 지지문을 읽고 문제에 답하십시오. 온라인 논의를 성공적으로 마치기 위해서는 학우들의 토론에 긍정적인 답변(피드백)을 제공해야 합니다.

케이스

새로 부임한 체육 선생님 김선생님은 무척 난감해하고 있습니다. “철수와 영희가 체육시간에 올 때마다 너무 부담스러워서 가슴이 답답합니다. 물론 체육교사인 제가 학생들을 잘 수용해야하고 그렇게 하고 싶습니다만, 제가 과연 잘할 수 있는지 잘 모르겠습니다. 그래서 불안합니다. 철수가 취약 X 증후군이 있다는 것과 영희가 다운 증후군을 가지고 있다는 것 외에는 별다른 정보를 가지고 있지 않습니다. 체육 시간에 조교가 함께 들어옵니다. 과연 이만큼의 정보를 가지고 무엇을 할 수 있을지 감이 오지 않습니다. 물론 철수와 영희가 체육시간에 함께 하여서 기쁩니다만, 한편으로는 제가 좀 더 그 아이들을 잘 교육할 수 있었음 좋겠습니다. 접근방법을 바꿔야 할까요? 아니면 제 교육과정을 바꿔야할까요? 만약 다른 학생들이 지루해 하거나 화를 내면 어떻게 할까요? 모든 학생들을 위한 시간이 부족하면 어떻하나요? 학생들의 다양한 수준과 학습 속도에 맞추기 위해서 조금 더 준비하기를 희망합니다.

학생설명
철수는 9 살의 취약 X 증후군이 있는 학생으로 행동면에서 문제가 있습니다. 철수는 다른 학생들이 설명을 듣거나 앉아 있을 때, 몸을 흔들거나 적절치 못한 소리를 내곤합니다. 철수는 체육활동에 참여하고, 지시를 따르는데 어려움이 있습니다.
영희는 9 살의 경미한 지적 장애의 다운증후군을 가지고 있습니다. 일학년 때부터 통합체육에 참여했지만, 여전히 균형감각, 협응력, 그리고 체력에 있어 뒤떨어집니다. 영희는 집중력이 쉬 떨어지며, 실패한 경험에 의해 쉽게 좌절합니다.

질문)
본 사례에 주 요점은 무엇입니까?
본 사례에 영향을 미친 요인들은 무엇입니까?
농구 첫번째 주 단원을 가르치는 데 있어 철수와 영희를 위한 교수전략 및 변형요소에 대해서 논의하십시오.

APPENDIX V. E-learning Supplement, English Version

11%

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I. Intellectual Disability

Definition – American Association on Intellectual and Developmental Disabilities (AAIDD, 2010)
"Characterized by significant limitations in intellectual functioning and in adaptive behavior expressed in conceptual, social, and practical adaptive skills. The disability originated before the 18."

Classification: In the past intellectual disability was classified by IQ. However, more recently ID has been classified by level of support needed for a person to function in society. Below are the four levels of support (AAIDD, 2010).

II. Dimension
Intermittent support: Support on an "as needed basis." An example would be support that is needed in order for a person to find a new job in the event of a job loss. Intermittent support may be needed occasionally by an individual over the life span, but not on a continuous daily basis.

Limited support : May Occur over a limited time span such as during transition from school to work or in time-limited job training. This type of support has a limit on the time that it is needed to provide appropriate support for an individual.

Extensive support: A life area is assistance that an individual needs on a daily basis that is not limited by time. This may involve support in the home and/or support in work. Intermittent, limited and extensive supports may not be needed in all life areas for an individual.

Pervasive support: Constant support across all environments and life areas and may include life-sustaining measures. A person requiring pervasive support will need assistance on a daily basis across all life areas.

• ID incidence: Estimated 2.28% of the total population
• ID causes: 1. Prenatal : Chromosomal Disorders (Down Syndrome). Heredity (Fragile X) Environmental (Diseases, drugs, alcohol)
2. Perinatal/Postnatal: Abnormal labor, head trauma, infection, oxygen deprivation, malnutrition, neglect & abuse.
Did you read the text?

- Yes
- No

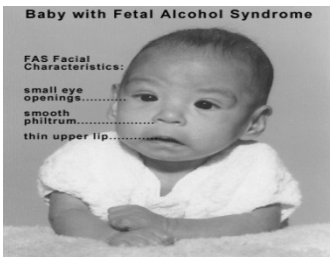
.Down syndrome (DS)
Cause: Having 3 instead of 2 chromosome in the 21st group, 1/733 births (NDSS, 2010)
- Students with DS function as a person with mild mental retardation

2.Fragile X
Causes: Change or mutation in the genetic information on the X chromosome
- Wide range of IQ
- Behaviors: Autistic behavior (Tantrums, Poor eye contact, Difficulty relating to others, anxiety), Hyperactive.

" target="_blank">

a. Young male with fragile X syndrome Same individual when mature b. Fragile X chromosome c. Inheritance pattern for fragile X syndrome

3.Fetal Alcohol Syndrome
Cause: Cluster of abnormalities (most notably facial features) that are the result of maternal alcohol consumption during pregnancy.
- Small stature, sensory problem, ADHD.



Did you read the text?

Yes

No

27%

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II. Characteristics of intellectual disabilities

Learning: Short-term memory, Difficulty in understand abstract concept e.g., as fast as you can, as far as you can, Hard to understand complex questions with excessive procedures. Only focus based on their own preference, focus on behavior of others

Learning rate of students with intellectual disabilities is usually 40-70% of the learning rate of students without intellectual disabilities. Students with intellectual disabilities may be limited to simpler form of formal operations, may not be able to process beyond the level of their attention span. This means you may need to teach less information to students with ID.

For example, it is probably more appropriate to teach the serve, bump and spike in volleyball along with the rule that you cannot lift a ball. You may also teach the rule about three hits on one side. But more details about rotating, strategies and advanced positioning is going to be difficult for many students with ID to understand.

Social: Difficulty in interacting with others, selective attention (focus on behavior of others but not what is taught)

Student with intellectual disabilities have difficulty generalizing information and learning from past experiences at the same rate as student without intellectual disabilities. They are likely to be unprepared to handle all the situations they encounter. They often do not fully understand what expected of them, and they might respond inappropriate because they have misinterpreted the situation.

For example, teaching passing and catching in basketball at a station does not mean the student will generalize this skill to passing in a game of basketball.

Motor: Low muscle tone, improvement observed in later age, More difficulty in fine motor skills than gross motor skills, issue in balance and coordination (lack of precision or smoothness in performance)

As a group, students with intellectual disabilities walk later, are slightly shorter, and usually are more susceptible to physical problems and illnesses compared with other students. In comparative study, students with intellectual disabilities consistently score lower than children without intellectual disabilities on measures of strength, endurance,

agility balance, running speed, flexibility, and reaction time.

For example, many students with ID will not have the strength to serve a volleyball over the net from the regulation line, and many students with ID may not have the endurance to run up and down the field in a soccer game.

The video is about the characteristics of individuals with intellectual disabilities
Please watch from 2:00 to 4:00
http://www.youtube.com/watch?v=-6-J_YcVRi4

Did you read the video?

- Yes
- No

Did you watch the video?

- Yes
- No

44%

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III. Teaching Strategies

1. Communication: Use shorter sentences. Do not give too many cues at one time. Use gestures and demonstrations to supplement verbal cues. Repeat directions and have student repeat directions back to you.

For example, when you teach softball pitching to a student with intellectual disability, It is better to provide verbal cue 'side, stretch, step, and throw' with demonstration than

general explanation ' make a side orientation, stretch your arms, make a step, and throw a ball'.

2. Practice: Extra practice trials, extra tome to master skills, more feedback after practice trials, Structure practice sessions (e.g., Using picture schedule), how to rehearse and practice.

3. Promote attention span: Do activities for shorter periods of time, have structure in the environment, provide praise often and be specific, reduce playing area to reduce distractions, eliminate distractions, direct teaching.

4. Peer tutoring: Peer tutors can provide support to students with disabilities. Supports from specialists often can be faded away so that the student is responding to more natural cues in the environment with occasional support from peers. As the peers become more comfortable with the student, the specialist can begin to train peers how to assist the student in participating in the game.

Please watch the videos.
1. You can see two students, a student with a hat and a student with pink pants. The student with pink pants are guiding the student with the hat.
Link 1 (0:38):
Link 2 (0:11): : http://www.youtube.com/watch?v=cczGi8zOOY8

2.These two videos describe how a student with disability play a team sports in actual game setting. Please watch the video
동영상 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

Did you read the text?

Yes

No

Did you watch the videos?

Yes

No

Please describe how to apply the teaching strategy, peer tutoring, in video link 1 and link 2.

61%

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IV. Equipment Modification
What is equipment modification? It involves any change that would make the participant more successful than he or she would be if using the unmodified equipment.
In a game of volleyball, a PE teacher can allow some students to use regulation volleyballs, other students to use larger volleyball trainers, and even other students such as those with disabilities that effect strength and coordination to use a beach ball to serve.
In a baseball game, a PE teacher can allow students with intellectual disability to bat on the T with bigger size ball or bat, while peers without disabilities bat a pitched ball with regular size ball and bat.

Example) Different size racquet

Example) Using T
View File

Example) Different size balls

Example) Different weight

Example)
Baseball: Nerf ball, Waffle ball, Bigger ball, Flat bases, Safety base, Fat bats, regulation bats, Batting tee, Gloves and catchers mitt different sizes, Helmet.
Basketball: Foam ball, Larger ball, Low basket, Wide basket, Texture ball, Bright basket.
Soccer: Larger ball, Ball on string, Sider goal, Flags, Cones, Larger goal.
Videos related with equipment modifications in team sports.
Link 1(3:18):
http://www.youtube.com/watch?v=Gh86OiF7OtY
Did you read the text?

- Yes
- No

Did you watch the video?

- Yes
- No

If yes, please describe at least two equipment modifications you observed in the video.

77%

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Exit Survey

V. Rule Modification

A rule modification can involve any deviation from the original or culturally accepted rules of the game. The instructor must create an atmosphere of flexibility among all participants

For example, in a soccer game, a student with intellectual disability can shoot or pass a ball without being defended. A PE teacher can allow different score system to a student with intellectual disability by scoring 2 points on making a goal of student with disability instead of 1 point. In a basketball game, a PE teacher can allow a student with disability walk without dribble. The team members must pass a ball to student with disability before a shooting.

Example
Baseball : Hit off of tee, Hit off ground, All bat before switching, Vary number of strokes, Time limitation, Two bases only, No tag-out, Peer runner/guide.

Basketball: No double-dribble rule, Different point awarded for baskets. Extra step on lay-up, Free shooting, Vary playing times, Increase number of players.

Soccer: Hands used for protection, No heading, Walk with ball, Stay in assigned area, Undefended, Free shooting, Lane soccer, Peer places, Ball on ground for kicking.

Videos related with rule modification.
Link 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
Link 2 (1:42): http://www.youtube.com/watch?v=llNPtv27C6o
Did you read the text?

- Yes
- No

Did you watch the videos?

- Yes
- No

If yes, please describe at least two rule modifications you observed in the videos.

100%

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VI. Environmental Modification

Environmental modifications include decreasing distractions, increasing visual cues, limiting noise, changing lighting, and increasing accessibility of the playing area.

In a baseball game, a teacher can vary the distance between bases. A student with disability will be allow to hit the base while, students without disabilities should hit the base with

In a basketball game, a teacher can use a box or trash can for a student with disability. The teacher can also apply same idea in the soccer game by drawing lines to extend the zone of goal port.

Example:
Baseball: Ropes leading to bases, Guide rail, Cones next to bases, Shorter pitching distance, Shorter base distance.
Basketball: Visual shooting line, Modify court size, Stations, Cones as boundaries.
Soccer: Modified field size, smooth surface, station.

Pleas watch a video related with environmental modification
Link 1 (3:48)
:http://www.youtube.com/watch?v=FLMECVRU6LE

Did you read the text?

- Yes
- No

Did you watch the video?

- Yes
- No

Please describe at least two environmental modification you observed in the video.

Your name?

APPENDIX VI. E-learning Supplement, Korean Version

11%

Back Exit Survey

I. 지적장애란?

지적 장애는 지적 기능은 물론 일상적인 사회적 및 실제적인 기술을 포함하는 적응 행동 모두에 심각한 제한을 보이는 특징을 말하며, 18 세 이전에 나타난다 (AAIDD, 2010) .

장애 등급 분류 : IQ 테스트 결과 (70-75 미만)로 장애인 등급을 분류하는 것이 일반적이였으나 (대한민국 장애인 복지법 규정). 장애인에 대한 특수교육법에는 지적 기능과 적응행동상의 어려움이 함께 전재하여 교육적 성취에 어려움이 있는 사람을 지적 장애 학생으로 분류하려는 움직임이 있다. 아래는 미국의 네가지 단계의 장애인 지원에 관한 내용이다 (AAIDD, 2010).

II. 복지 기준 설명
1. 간헐적 지원: 장애인의 필요에 의해 발생되는 지원이다. 예를 들어, 다니고 있던 직장을 잃어 새로운 직장을 찾는 시기에만 충원되는 지원을 말한다. 간헐적인 지원은 장애인의 생애 중 상황에 따라 필요한 때에만 발생되며, 이는 일일 주기로 지속적으로 발생되는지원과 다르다.
2. 제한적 지원: 제한적인 시간동안에 발생되는 지원으로서, 학교에서 직장으로 넘어가는 과도적인 시기, 혹은 제한적 시간 내의 직업 훈련 시기의 기간동안 발생한다. 이런 방식의 지원은 제한된 시간동안 개인에게 필요한 적절한지원을 해주는 것을 의미한다.
3. 확장적 지원: 지원 시간의 제한없이, 일일 주기(매일)로 발생되는 지원을 포함한다. 이는 가정 내 혹은 직장 내에서의 지원을 포함한다. 간헐적, 제한적, 그리고 확장적 지원은 장애인의 평생에 걸쳐 요구되는 지원은 아니다.
4. 편재적 지원: 생활 및 환경 전반에 걸친 지속적인 지원을 의미하며,이는 생존 유지를 위한조치를 포함한다.편재적 지원이 요구되는 장애인은 평생동안 전반적인 생활에 대해 일일주기(매일) 지원을 받는다.

III. 지적장애인 인구 통계: 통계적으로 전체 인구의 2.28% 가 지적 장애를 가지고 있다.
IV. 지적장애 원인: 1. 출생전 : 염색체 (다운 증후군), 유전 (취약 X 증후군), 환경 (질병, 음주, 및 투약, 태아 알콜 증후군)
2. 출생 중/후: 난산, 두개관내 출혈, 감염, 영양실조, 산소결핍, 학대 및 무관심

위의 지문을 읽었습니까?

예

아니오

17%

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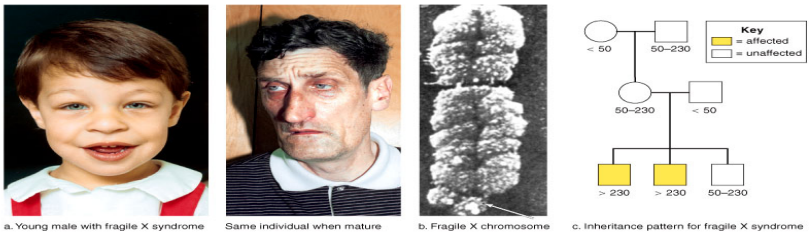
1. 다운 증후군

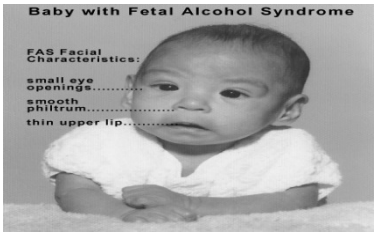
• 원인 – 다운 증후군은 유전병의 일종으로 21 번 염색체가 정상인보다 많은 경우에 나타나는 질병이다. 733 명당 1 명꼴로 발병한다 (NDSS, 2010)
– 다운증후군을 가진 학생은 경미한 지적 장애 (IQ 50-70)를 가지고 있다.

2.취약 X 증후군
원인: 유전성 질환으로서, 돌연변이 X 염색체 혹은 X 염색체내 정보 변형.
– 광범위한 지적능력의 범위 (IQ)
– 행동적 특징: 자폐아적 특성 (짜증, 눈맞춤 부재, 불안, 낮은 사회화), 주의력 결핍 및 과잉행동장애.



a. Young male with fragile X syndrome
Same individual when mature
b. Fragile X chromosome
c. Inheritance pattern for fragile X syndrome

3. 태아 알콜 증후군
원인: 산모의 알콜 섭취로 인한 일련의 기형 발생 (대부분 얼굴의 생김새로 진단).
– 일반인보다 작은 신장, 감각장애, 주의력 결핍 및 과잉행동장애.



위의 지문을 읽었습니까?

- 예
- 아니오

II. 지적 장애인들의 특징

1.학습: 단기 기억 능력, 압축된 개념을 이해하기 힘듦 (최대한 빨리, 최대한 멀리), 복잡하거나 여러 단계의 사고를 요하는 질문을 이해하는 데 여러움이 있음, 개인적인 관심에만 집중을 함, 다른 사람의 행동(상호적인 대화가 아닌)에만 집중을 함.

예를들어, 배구 수업에서는 서브, 토스, 및 스파이크를 가르친다고 가정했을 때, 체육교사는 위 세가지 기술 (서브, 토스, 및 스파이크)과 함께 공을 손으로 들은 채 기술을 수행할 수 없다는 규칙까지 가르치는 것이 요구됩니다. 체육교사는 3 회 토스 후 선회되는 규칙을 가르칠 수 있다. 하지만 배구공의 선회, 게임 전략 및 고급 기술등을 가르치는 데는 일반 학생들을 가르칠 때보다 더 자세하게 가르쳐야 하며, 이해시키는 데 더 오랜 시간이 걸린다.

2.사회성: 다른 사람과 상호적인 소통을 하는 데 어려움이 있음, 선택적 주의 (교사의 지도가 아닌 원하는 대상에 대해서만 관심을 둠)

지적 장애 학생은 비장애 학생들에 비해 정보를 일반화 시키는 데 어려움이 있으며, 과거의 경험으로부터 학습이 되는 데 어려움이 있다. 대부분 지적 장애 학생들은 그들에게 주어진 상황을 처리하는 데 어려움이 있다. 또한 그들에게 기대되는 행동을 완전히 이해하기 어려우며, 상황에 대한 미숙한 판단으로 부적절한 행동을 보이기도 한다.

예를들어, 농구 수업시, 그룹을 지어 패스를 연습할 때 지적 장애 학생은 패스 (공을 던지고 받는) 실제 농구경기 상황에서 패스를 하는 데 어려움을 보일 수도 있다.

3.운동학습: 낮은 근 긴장도, 청소년기 부터 운동 발달의 향상을 관찰할 수 있다. 대근육 운동 기술에 비해 소근육 운동기술에 어려움이 있다. 대부분의 지적장애 학생들은 비장애 인들보다 보행 발현이 늦으며, 신장 (伸張)이 작고, 신체적으로 취약한 점들을 보인다. 한 비교연구에 따르면, 지적 장애아들은 비장애아들에 비해 근력, 지구력, 민첩성, 균형감각, 달리기 속도, 유연성 , 반응속도에 낮은 점수를 받았다고 보고했다.

예를 들어, 많은 지적 장애 학생들은 배구연습시 배구공을 서브해서 네트를 넘길만큼의 근력을 가지고 있지 않을 수 있으며, 축구 시합에서 경기장을 계속 뛰어다닐 만큼의 지구력을 가지고 있지 않을 수도 있다.

아래 비디오는 지적 장애 학생의 특징을 나타내는 동영상 입니다. 동영상 중 2 분에서 4 분까지만 시청하십시오.
http://www.youtube.com/watch?v=-6-J_YcVRi4

당신은 위의 지문을 읽었습니까?

- 예
- 아니오

당신은 위의 비디오를 시청하였습니까?

- 예
- 아니오

III. 지적장애학생을 위한 효과적인 교수법

1. 대화법: 짧은 문장을 쓴다. 너무 많은 정보를 한번에 제공하지 않는다. 구두를 설명시, 몸짓 및 시범과 함께 보여준다. 교사는 지도사항을 반복적으로 학생에게 제시하여야 하며, 학생에게 교사의 지도사항을 따라서 말하도록 지도한다.

예를 들어, 교사가 소포트볼 투구(pitching)을 지적 장애 학생에게 가르칠 때, 학생에게 '옆으로 서고, 팔을 쭉 펴고, 여기를 밟고, 공을 던져' 라도 설명하는 것 보다, 구두의 신호 ,'옆으로서, 팔뻣쳐, 발굴러, 던져',를 시범과 함께 보여주는 것이 더 효과적이다.

2. 연습: 기술을 습득하는데 추가적인 연습시간 및 연습 기회가 요구된다. 구조화된 연습 기회 (그림 시간표)가 요구되며, 학생이 기술을 실현한 직후 피드백을 제공한다. 실제 경기에서 어떻게 실현하지를 연습한다.

3. 집중력 향상: 연습 시간을 짧게 한다. 연습환경을 구조화 시켜, 집중력을 방해하는 환경적인 요소들을 제거한다. 긍정적인 피드백을 지속적으로 제공한다. 연습 구역의 크기를 줄여 집중에 방해하는 요소들을 제가한다. 직접 교수법이 효과가 높다.

4. 또래 교수법: 또래로 하여금 장애 학생의 학습을 촉진하게 하는 것을 말한다. 장애 학생들은 교사들의 지시 및 교수법에 타성이 생길 수 있기 때문에, 또래 교수법을 적용함으로서 장애 학생들에게 좀 더 자연스러운 환경에서 또래로 부터 자극에 더 잘 반응할 기회를 제공해줄 수 있다. 또래 학생들이 통합 체육에 익숙해 지면, 또래 학생들을 훈련 시켜 더욱 효과적인 또래 교수법을 제시할 수 있다.

아래의 동영상은 또래 교수 적용의 예를 보여줍니다.
1.분홍색 바지를 입은 학생과 모자를 쓴 학생을 주목하십시오.
동영상 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
동영상 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8

2. 아래 비디오는 다운 신드롬 남학생이 실제 풋볼(football) 경기에 참여하는 영상입니다. 이 학생은 waterboy (팀원들이 마실 물을 준비하는 팀원) 이였지만, 실제 풋볼경기에 참여하게 됩니다.
동영상 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

당신은 위의 본문을 읽었습니까?

- 예
- 아니오

당신은 위의 비디오를 시청하였습니까?

- 예
- 아니오

1 번, 2 번 비디오의 또래교수법 영상에서 관찰된 교수법을 나열하십시오.

58%

Back Exit Survey

기자재 변형

기자재 변형은 기자재(공 및 라켓)을 사용함으로서 일반적으로 규격화된 기자재 (공식 규격 농구공 혹은 공식 규격 배구공) 사용시 보다 지적 장애 학생의 체육참여 성공률을 높이기 위함이다.

예를 들어 배구 경기에서, 체육교사 장애 학생을 위해 공의 크기와 무게를 변형 시킬 수 있다. 비장애 학생들은 일반 배구공을 사용하는 데 반해, 장애 학생들은 일반 배구공보다 크기가 더 큰 공, 혹은 더 가벼운 공으로 서브하는 것을 허락한다.

야구 경기에서는 장애 학생이 타석에 위치했을 때, 비장애 학생들은 일반 야구공과 일반 배트를 사용하는 것에 반해, 장애 학생들은 T 위에 크기가 더 큰 공이을 고정 시키구나 더 큰 배트를 사용하는 하게 한다.

예 1) 다른 라켓의 예

예 2) T 사용의 예
View File
예 3) 다른 크기의 공

예 4) 다른 무게의 예

통합 체육의 예)
야구: 다른 사이즈의 공, 부드러운 질감의 공, 안전 구역 허락, 두꺼운 배트, T 사용, 헬멧 허용, 다른 크기의 글러브 허용

농구: 스펀지로 된 가벼운 공, 더 큰 크기의 공, 부드러운 질감의 공, 밝은 색깔의 공.

축구: 더 큰 크기의 공, 더 가벼운 공, 줄에 연결된 공,

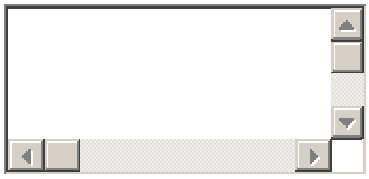
아래 동영상을 시청하십시오. 동영상은 농구에서의 기자재 변경에 대해서 설명하고 있습니다.

http://www.youtube.com/watch?v=Gh86OiF7OtY
당신은 위의 지문을 읽고 비디오를 시청했습니까?

예

아니오

위 동영상은 농구 드리블 교육시 어떻게 기자재 변형을 적절히 적용할 수 있는지에 대한 예를 보여주고 있습니다. 동영상에서 제시된 기자재 변형의 예들 중, 적어도 한가지 이상을 기술하시오.



76%

100%

Back Exit Survey

환경 변형

환경 변형은 집중을 방해하는 요소들을 제한시키는 것, 시각효과의 최대화, 소음 제한, 조명 변형, 운동범위의 접근성 증대등의 환경적인 요소들을 변형시키는 것을 포함한다.
증가등이 있다.

야구 게임에서는,교사는 베이스 (일루-이루-삼루) 사이의 거리를 병형할 수 있다. 비장애 학생들은 일반 규격의 베이스 사이의 거리를 유지하는 반면, 장애 학생들은 베이스 사이의 거리를 좁혀주어 장애 학생들에게 더 많은 성공률을 제공해줄 수 있다. 농구 경기 에서 ,교사는 장애 학생 을위한 코트의 크기가 좁히거나, 또한 골 인정하는 영역을 확장할 수 있다.

예)
야구 : 밧줄로 베이스 (일루-이루-삼루) 사이를 연결함, 가드레일을 설치, 짧은 투구 거리 허용, 각 루(1 루-2 루-3 루) 간의 거리
농구 : 규격된 골대 대신 큰 박스나 큰 쓰레기통을 사용. 수정 코트 의 크기 변형 , 삼각대 혹은 콘(cone)으로 위치 선정.
축구 : 필드 크기 조정 , 표면이 부드러운 필드 선택, 모듬 활동 허용.

아래 환경변형에 관련된 동영상입니다.
동영상: (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

당신은 위의 본문을 읽었습니까? 예 ( ) 아니오( )
당신은 동영상을 시청했습니까? 예( ) 아니오( )
만약 당신이 동영상을 시청했다면, 당신이 동영상에서 관찰한 환경변형에 대해서 두개 이상 기술하십오.
환경 변형이란 , 주의력을 결핍시킬 수 있는 환경적인 요소들을 변형시키는 것을 말한다. 예를 들어, 시각효과의 최대화, 소음 제한, 조명 변형, 운동범위의 접근성 증가등이 있다.

야구 게임에서는,교사는 베이스 (일루-이루-삼루) 사이의 거리를 병형할 수 있다. 비장애 학생들은 일반 규격의 베이스 사이의 거리를 유지하는 반면, 장애 학생들은 베이스 사이의 거리를 좁혀주어 장애 학생들에게 더 많은 성공률을 제공해줄 수 있다.
농구 경기 에서 ,교사는 장애 학생 을위한 코트의 크기가 좁히거나, 또한 골 인정하는 영역을 확장할 수 있다.

예 :
야구 : 밧줄로 베이스 (일루-이루-삼루) 사이에 가드레일을 설치, 짧은 투구 거리 허용.

농구 : 수정 코트 의 크기 변형 , 삼각대 혹은 콘(cone)으로 위치 선정.

축구 : 필드 크기 , 필드 표면.

동영상을 시청 하십시오

http://www.youtube.com/watch?v=dDXRNhZfTHU

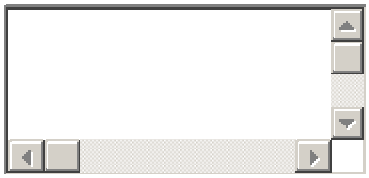
당신은 지문을 읽고, 동영상을 시청 습니까?

- 예
- 아니오

당신은 동영상을 시청하였습니까?

- 예
- 아니오

위의 동영상에서 관찰된 환경 변형의 예를 한개 이상 기술 하시오.



당신의 이름은?

APPENDIX VII. Traditional Supplement, English Version

I. Intellectual Disability

Definition – American Association on Intellectual and Developmental Disabilities (AAIDD, 2010)
"Characterized by significant limitations in intellectual functioning and in adaptive behavior expressed in conceptual, social, and practical adaptive skills. The disability originated before the 18."

Classification: In the past intellectual disability was classified by IQ. However, more recently ID has been classified by level of support needed for a person to function in society. Below are the four levels of support (AAIDD, 2010).

Dimension	Detail
Intermittent support	Support on an "as needed basis." An example would be support that is needed in order for a person to find a new job in the event of a job loss. Intermittent support may be needed occasionally by an individual over the life span, but not on a continuous daily basis.
Limited support	May Occur over a limited time span such as during transition from school to work or in time-limited job training. This type of support has a limit on the time that it is needed to provide appropriate support for an individual.
Extensive support	A life area is assistance that an individual needs on a daily basis that is not limited by time. This may involve support in the home and/or support in work. Intermittent, limited and extensive supports may not be needed in all life areas for an individual.
Pervasive support	Constant support across all environments and life areas and may include life-sustaining measures. A person requiring pervasive support will need assistance on a daily basis across all life areas.

- ID incidence: Estimated 2.28% of the total population
- ID causes: 1. Prenatal: Chromosomal Disorders (Down Syndrome). Heredity (Fragile X)
  Environmental (Diseases, drugs, alcohol)
  2. Perinatal/Postnatal: abnormal labor, head trauma, infection, oxygen deprivation, malnutrition, neglect & abuse

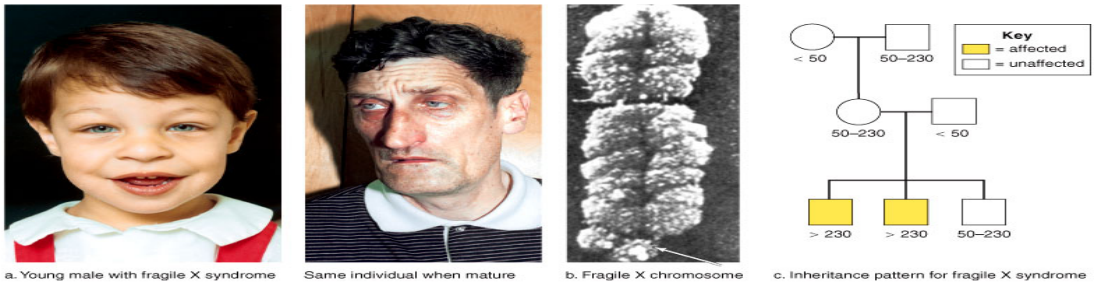
1.Down syndrome (DS)
Cause: Having 3 instead of 2 chromosome in the 21st group, 1/733 births (NDSS, 2010)
- Students with DS function as a person with mild mental retardation

2.Fragile X sydrome
Causes: Change or mutation in the genetic information on the X chromosome
- Wide range of IQ
- Behaviors: Autistic behavior (Tantrums, Poor eye contact, Difficulty relating to others, anxiety), Hyperactive.

3. Fetal Alcohol Syndrome

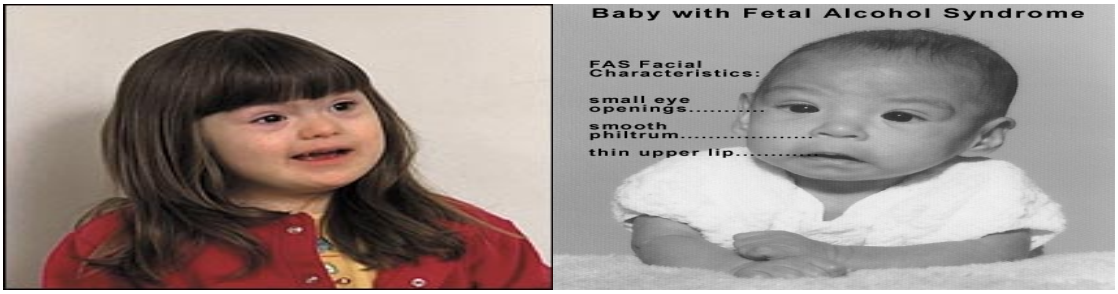
Cause: Cluster of abnormalities (most notably facial features) that are the result of maternal alcohol consumption during pregnancy.

- Small stature, sensory problem, ADHD.



a. Young male with fragile X syndrome | Same individual when mature | b. Fragile X chromosome | c. Inheritance pattern for fragile X syndrome

A boy with Fragile X Syndrome



A girl with Down Syndrome A baby with Fatal Alcohol Syndrome

Did you read the text? Yes ( ), No ( )

II. Characteristics of intellectual disabilities

Learning: Short-term memory, Difficulty in understand abstract concept e.g., as fast as you can, as far as you can, Hard to understand complex questions with excessive procedures. Only focus based on their own preference, focus on behavior of others

Learning rate of students with intellectual disabilities is usually 40-70% of the learning rate of students without intellectual disabilities. Students with intellectual disabilities may be limited to simpler form of formal operations, may not be able to process beyond the level of their attention span. This means you may need to teach less information to students with ID.

For example, it is probably more appropriate to teach the serve, bump and spike in volleyball along with the rule that you cannot lift a ball. You may also teach the rule about three hits on one side. But more details about rotating, strategies and advanced positioning is going to be difficult for many students with ID to understand.

Social: Difficulty in interacting with others, selective attention (focus on behavior of others but not what is taught)

Student with intellectual disabilities have difficulty generalizing information and learning from past experiences at the same rate as student without intellectual disabilities. They are likely to be unprepared to handle all the situations they encounter. They often do not fully understand what expected of them, and they might respond inappropriate because they have misinterpreted the situation.

For example, teaching passing and catching in basketball at a station does not mean the student will generalize this skill to passing in a game of basketball.

Motor: Low muscle tone, improvement observed in later age, More difficulty in fine motor skills than gross motor skills, issue in balance and coordination (lack of precision or smoothness in performance)

As a group, students with intellectual disabilities walk later, are slightly shorter, and usually are more susceptible to physical problems and illnesses compared with other students. In comparative study, students with intellectual disabilities consistently score lower than children without intellectual disabilities on measures of strength, endurance, agility balance, running speed, flexibility, and reaction time.

For example, many students with ID will not have the strength to serve a volleyball over the net from the regulation line, and many students with ID may not have the endurance to run up and down the field in a soccer game.

The video is about the characteristics of individuals with intellectual disabilities
Please watch from 2:00 t0 4:00
http://www.youtube.com/watch?v=-6-J_YcVRi4

Did you read the text? Yes ( ), No ( )
Did you watch the video? Yes ( ), No ( )

Teaching Strategies

1. Communication: Use shorter sentences. Do not give too many cues at one time.
Use gestures and demonstrations to supplement verbal cues. Repeat directions and have student repeat directions back to you.

For example, when you teach softball pitching to a student with intellectual disability, It is better to provide verbal cue 'side, stretch, step, and throw' with demonstration than general explanation ' make a side orientation, stretch your arms, make a step, and throw a ball'.

2. Practice: Extra practice trials, extra tome to master skills, more feedback after practice trials, Structure practice sessions (e.g., Using picture schedule), how to rehearse and practice.

3. Promote attention span: Do activities for shorter periods of time, have structure in the environment, provide praise often and be specific, reduce playing area to reduce distractions, eliminate distractions, direct teaching.

4. Peer tutoring: Peer tutors can provide support to students with disabilities. Supports from specialists often can be faded away so that the student is responding to more natural cues in the environment with occasional support from peers. As the peers become more comfortable with the student, the specialist can begin to train peers how to assist the student in participating in the game.




Please watch the videos.
1. You can see two students, a student with a hat and a student with pink pants. The student with pink pants are guiding the student with the hat.
Link 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
Link 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8

2.These two videos describe how a student with disability play a team sports in actual game setting. Please watch the video.
Link3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

Did you read the text? Yes ( ), No ( )
Did you watch the video? Yes ( ), No ( )
Please describe how to apply the teaching strategy, peer tutoring, in video link 1 and link2.
( )

Equipment Modification

What is equipment modification? It involves any change that would make the participant more successful than he or she would be if using the unmodified equipment.
In a game of volleyball, a PE teacher can allow some students to use regulation volleyballs, other students to use larger volleyball trainers, and even other students such as those with disabilities that effect strength and coordination to use a beach ball to serve.
In a baseball game, a PE teacher can allow students with intellectual disability to bat on the T with bigger size ball or bat, while peers without disabilities bat a pitched ball with regular size ball and bat.




Example)
Baseball: Nerf ball, Waffle ball, Bigger ball, Flat bases, Safety base, Fat bats, regulation bats, Batting tee, Gloves and catchers mitt different sizes, Helmet.
Basketball: Foam ball, Larger ball, Low basket, Wide basket, Texture ball, Bright basket.
Soccer: Larger ball, Ball on string, Sider goal, Flags, Cones, Larger goal.
Videos related with equipment modifications in team sports.
Link 1(3:18): http://www.youtube.com/watch?v=Gh86OiF7OtY

Did you read the text? Yes ( ), No ( )
Did you watch the video? Yes ( ), No ( )
If yes, please describe at least two equipment modifications you observed in the video.
( )

Rule Modification

A rule modification can involve any deviation from the original or culturally accepted rules of the game. The instructor must create an atmosphere of flexibility among all participants

For example, in a soccer game, a student with intellectual disability can shoot or pass a ball without being defended. A PE teacher can allow different score system to a student with intellectual disability by scoring 2 points on making a goal of student with disability instead of 1 point. In a basketball game, a PE teacher can allow a student with disability walk without dribble. The team members must pass a ball to student with disability before a shooting.

Example
Baseball : Hit off of tee, Hit off ground, All bat before switching, Vary number of strokes, Time limitation, Two bases only, No tag-out, Peer runner/guide.

Basketball: No double-dribble rule, Different point awarded for baskets. Extra step on lay-up, Free shooting, Vary playing times, Increase number of players.

Soccer: Hands used for protection, No heading, Walk with ball, Stay in assigned area, Undefended, Free shooting, Lane soccer, Peer places, Ball on ground for kicking.

Videos related with rule modification.
Link 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
Link 2 (1:42): http://www.youtube.com/watch?v=IlNPtv27C6o

Did you read the text? Yes ( ), No ( )
Did you watch the video? Yes ( ), No ( )
If yes, please describe at least two rule modifications you observed in the video.
( )

Environmental Modification

Environmental modifications include decreasing distractions, increasing visual cues, limiting noise, changing lighting, and increasing accessibility of the playing area.

In a baseball game, a teacher can vary the distance between bases. A student with disability will be allow to hit the base while, students without disabilities should hit the base with

In a basketball game, a teacher can use a box or trash can for a student with disability. The teacher can also apply same idea in the soccer game by drawing lines to extend the zone of goal port.

Example:

Baseball: Ropes leading to bases, Guide rail, Cones next to bases, Shorter pitching distance, Shorter base distance.

Basketball: Visual shooting line, Modify court size, Stations, Cones as boundaries.

Soccer: Modified field size, smooth surface, station.

Pleas watch a video related with environmental modification
Link 1 (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

Did you read the text? Yes ( ), No ( )
Did you watch the video? Yes ( ), No ( )
If yes, please describe at least two environmental modifications you observed in the video.
( )

APPENDIX VIII. Traditional Supplement, Korean Version

I.지적장애란?

지적 장애는 지적 기능은 물론 일상적인 사회적 및 실제적인 기술을 포함하는 적응 행동 모두에 심각한 제한을 보이는 특징을 말하며, 18 세 이전에 나타난다 (AAIDD, 2010) .

장애 등급 분류 : IQ 테스트 결과 (70-75 미만)로 장애인 등급을 분류하는 것이 일반적이였으나 (대한민국 장애인 복지법 규정). 장애인에 대한 특수교육법에는 지적 기능과 적응행동상의 어려움이 함께 전재하여 교육적 성취에 어려움이 있는 사람을 지적 장애 학생으로 분류하려는 움직임이 있다. 아래는 미국의 네가지 단계의 장애인 지원에 관한 내용이다 (AAIDD, 2010).

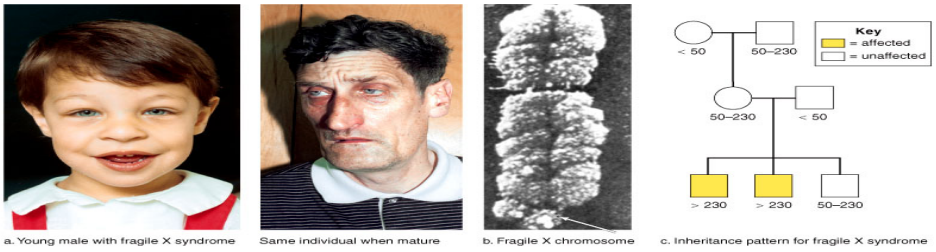
복지 기준	설명
간헐적 지원	장애인의 필요에 의해 발생되는 지원이다. 예를 들어, 다니고 있던 직장을 잃어 새로운 직장을 찾는 시기에만 충원되는 지원을 말한다. 간헐적인 지원은 장애인의 생애 중 상황에 따라 필요한 때에만 발생되며, 이는 일일 주기로 지속적으로 발생되는지원과 다르다.
제한적 지원	제한적인 시간동안에 발생되는 지원으로서, 학교에서 직장으로 넘어가는 과도적인 시기, 혹은 제한적 시간 내의 직업 훈련 시기의 기간동안 발생한다. 이런 방식의 지원은 제한된 시간동안 개인에게 필요한 적절한지원을 해주는 것을 의미한다.
확장적 지원	지원 시간의 제한없이, 일일 주기(매일)로 발생되는 지원을 포함한다. 이는 가정 내 혹은 직장 내에서의 지원을 포함한다. 간헐적, 제한적, 그리고 확장적 지원은 장애인의 평생에 걸쳐 요구되는 지원은 아니다.
편재적 지원	생활 및 환경 전반에 걸친 지속적인 지원을 의미하며,이는 생존 유지를 위한조치를 포함한다.편재적 지원이 요구되는 장애인은 평생동안 전반적인 생활에 대해 일일주기(매일) 지원을 받는다.

지적장애인 인구 통계: 통계적으로 전체 인구의 2.28% 가 지적 장애를 가지고 있다.
지적장애 원인: 1. 출생전 : 염색체 (다운 증후군), 유전 (취약 X 증후군), 환경 (질병, 음주, 및 투약, 태아 알콜 증후군)
2. 출생 중/후: 난산, 두개관내 출혈, 감염, 영양실조, 산소결핍, 학대 및 무관심

1.다운 증후군
원인 - 다운 증후군은 유전병의 일종으로 21 번 염색체가 정상인보다 많은 경우에 나타나는 질병이다. 733 명당 1 명꼴로 발병한다 (NDSS, 2010)
- 다운증후군을 가진 학생은 경미한 지적 장애 (IQ 50-70)를 가지고 있다.

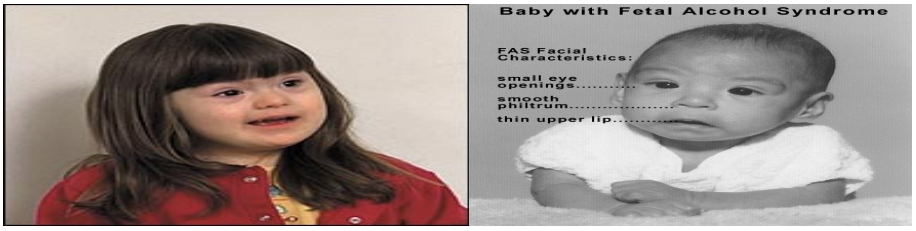
2.취약 X 증후군
원인: 유전성 질환으로서, 돌연변이 X 염색체 혹은 X 염색체내 정보 변형.
광범위한 지적능력의 범위 (IQ)
행동적 특징: 자폐아적 특성 (짜증, 눈맞춤 부재, 불안, 낮은 사회화), 주의력 결핍 및 과잉행동장애.

3. 태아 알콜 증후군
원인: 산모의 알콜 섭취로 인한 일련의 기형 발생 (대부분 얼굴의 생김새로 진단).
일반인보다 작은 신장, 감각장애, 주의력 결핍 및 과잉행동장애.



a. Young male with fragile X syndrome　Same individual when mature　b. Fragile X chromosome　c. Inheritance pattern for fragile X syndrome

취약 X 신드롬 남성: 두 사진은 같은 인물임



다운 증후군 소녀　　태아 알콜 증후군 유아의 얼굴 특징

당신은 위의 본문을 읽었습니까? 예 (　　) 아니오 (　　)

II.지적 장애인들의 특징

1.학습: 단기 기억 능력, 압축된 개념을 이해하기 힘듦 (최대한 빨리, 최대한 멀리), 복잡하거나 여러 단계의 사고를 요하는 질문을 이해하는 데 여러움이 있음, 개인적인 관심에만 집중을 함, 다른 사람의 행동(상호적인 대화가 아닌)에만 집중을 함.

예를들어, 배구 수업에서는 서브, 토스, 및 스파이크를 가르친다고 가정했을 때, 체육교사는 위 세가지 기술 (서브, 토스, 및 스파이크)과 함께 공을 손으로 들은 채 기술을 수행할 수 없다는 규칙까지 가르치는 것이 요구됩니다. 체육교사는 3 회 토스 후 선회되는 규칙을 가르칠 수 있다. 하지만 배구공의 선회, 게임 전략 및 고급 기술등을 가르치는 데는 일반 학생들을 가르칠 때보다 더 자세하게 가르쳐야 하며, 이해시키는 데 더 오랜 시간이 걸린다.

2.사회성: 다른 사람과 상호적인 소통을 하는 데 어려움이 있음, 선택적 주의 (교사의 지도가 아닌 원하는 대상에 대해서만 관심을 둠)

지적 장애 학생은 비장애 학생들에 비해 정보를 일반화 시키는 데 어려움이 있으며, 과거의 경험으로 부터 학습이 되는 데 어려움이 있다. 대부분 지적 장애 학생들은 그들에게 주어진 상황을 처리하는 데 어려움이 있다. 또한 그들에게 기대되는 행동을 완전히 이해하기 어려우며, 상황에 대한 미숙한 판단으로 부적절한 행동을 보이기도 한다.

예를들어, 농구 수업시, 그룹을 지어 패스를 연습할 때 지적 장애 학생은 패스 (공을 던지고 받는) 실제 농구경기 상황에서 패스를 하는 데 어려움을 보일 수도 있다.

3.운동학습: 낮은 근 긴장도, 청소년기 부터 운동 발달의 향상을 관찰할 수 있다. 대근육 운동 기술에 비해 소근육 운동기술에 어려움이 있다. 대부분의 지적장애 학생들은 비장애 인들보다 보행 발현이 늦으며, 신장 (伸張)이 작고, 신체적으로 취약한 점들을 보인다. 한 비교연구에 따르면, 지적 장애아들은 비장애아들에 비해 근력, 지구력, 민첩성, 균형감각, 달리기 속도, 유연성 , 반응속도에 낮은 점수를 받았다고 보고했다.

예를 들어, 많은 지적 장애 학생들은 배구연습시 배구공을 서브해서 네트를 넘길만큼의 근력을 가지고 있지 않을 수 있으며, 축구 시합에서 경기장을 계속 뛰어다닐 만큼의 지구력을 가지고 있지 않을 수도 있다.

아래 비디오는 지적 장애 학생의 특징을 나타내는 동영상 입니다. 동영상 중 2 분에서 4 분까지만 시청하십시오.
http://www.youtube.com/watch?v=-6-J_YcVRi4

당신은 본문을 읽었습니까? 예 ( ) 아니오 ( )
당신은 동영상을 시청하였습니까? 예 ( ) 아니오 ( )

III.지적장애 학생을 위한 교수법

1. **대화법**: 짧은 문장을 쓴다. 너무 많은 정보를 한번에 제공하지 않는다. 구두를 설명시, 몸짓 및 시범과 함께 보여준다. 교사는 지도사항을 반복적으로 학생에게 제시하여야 하며, 학생에게 교사의 지도사항을 따라서 말하도록 지도한다.

예를 들어, 교사가 소포트볼 투구(pitching)을 지적 장애 학생에게 가르칠 때, 학생에게 '옆으로 서고, 팔을 쭉 펴고, 여기를 밟고, 공을 던져' 라도 설명하는 것 보다, 구두의 신호 ,'옆으로서, 팔뻣쳐, 발굴러, 던져',를 시범과 함께 보여주는 것이 더 효과적이다.

2. 연습: 기술을 습득하는데 추가적인 연습시간 및 연습 기회가 요구된다. 구조화된 연습 기회 (그림 시간표)가 요구되며, 학생이 기술을 실현한 직후 피드백을 제공한다. 실제 경기에서 어떻게 실현하지를 연습한다.

3. 집중력 향상: 연습 시간을 짧게 한다. 연습환경을 구조화 시켜, 집중력을 방해하는 환경적인 요소들을 제거한다. 긍정적인 피드백을 지속적으로 제공한다. 연습 구역의 크기를 줄여 집중에 방해하는 요소들을 제가한다. 직접 교수법이 효과가 높다.

4. 또래 교수법: 또래로 하여금 장애 학생의 학습을 촉진하게 하는 것을 말한다. 장애 학생들은 교사들의 지시 및 교수법에 타성이 생길 수 있기 때문에, 또래 교수법을 적용함으로서 장애 학생들에게 좀 더 자연스러운 환경에서 또래로 부터 자극에 더 잘 반응할 기회를 제공해줄 수 있다. 또래 학생들이 통합 체육에 익숙해 지면, 또래 학생들을 훈련 시켜 더욱 효과적인 또래 교수법을 제시할 수 있다.



아래의 동영상은 또래 교수 적용의 예를 보여줍니다.
1.분홍색 바지를 입은 학생과 모자를 쓴 학생을 주목하십시오.
동영상 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
동영상 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8

2. 아래 비디오는 다운 신드롬 남학생이 실제 풋볼(football) 경기에 참여하는 영상입니다. 이 학생은 waterboy (팀원들이 마실 물을 준비하는 팀원) 이였지만, 실제 풋볼경기에 참여하게 됩니다.
동영상 3 (2:06) : http://www.youtube.com/watch?v=lum0J7hXQLs

당신은 위의 본문을 읽었습니까? 예 ( ) 아니오 ( )
당신은 동영상을 시청하였습니까? 예 ( ) 아니오 ( )

1 번, 2 번 비디오의 또래교수법 영상에서 관찰된 교수법을 나열하십시오.
( )

VI.기자재 변형 (Equipment Modification)
기자재 변형은 기자재(공 및 라켓)을 사용함으로서 일반적으로 규격화된 기자재 (공식 규격 농구공 혹은 공식 규격 배구공) 사용시 보다 지적 장애 학생의 체육참여 성공률을 높이기 위함이다.

예를 들어 배구 경기에서, 체육교사 장애 학생을 위해 공의 크기와 무게를 변형 시킬 수 있다. 비장애 학생들은 일반 배구공을 사용하는 데 반해, 장애 학생들은 일반 배구공보다 크기가 더 큰 공, 혹은 더 가벼운 공으로 서브하는 것을 허락한다.
야구 경기에서는 장애 학생이 타석에 위치했을 때, 비장애 학생들은 일반 야구공과 일반 배트를 사용하는 것에 반해, 장애 학생들은 T 위에 크기가 더 큰 공이을 고정 시키구나 더 큰 배트를 사용하는 하게 한다.

T 사용의 예 다른 무게의 예 다른 크기의 라켓의 예 다른 크기의 공의 예

예)
야구: 다른 사이즈의 공, 부드러운 질감의 공, 안전 구역 허락, 두꺼운 배트, T 사용, 헬멧 허용, 다른 크기의 글러브 허용

농구: 스펀지로 된 가벼운 공, 더 큰 크기의 공, 부드러운 질감의 공, 밝은 색깔의 공.
축구: 더 큰 크기의 공, 더 가벼운 공, 줄에 연결된 공,

아래 동영상을 시청하십시오. 동영상은 농구에서의 기자재 변경에 대해서 설명하고 있습니다.
동영상(3:18): http://www.youtube.com/watch?v=Gh86OiF7OtY

당신은 본문을 읽었습니까? 예 ( ) 아니오 ( )
당신은 동영상을 시청하였습니까? 예 ( ) 아니오 ( )
만약 당신이 동영상을 시청하였다면, 동영상에서 관찰된 기자재 변형의 예를 적어도 두개 나열하십시오.
( )

V.규칙 변형 (Rule Modification)

규칙변형은 스포츠 게임에 있어 실제 전통적으로 허용되는 규칙으로부터 벗어나는 것을 의미한다.
체육교사는 반드시 모든 학생들 (장애 학생 및 비장애 학생)에게 유연한 수업 분위기을 조성해야만 한다.

예를 들어, 축구 게임 단원시, 지적 장애 학생이 슛을 하기나 패스를 할 때 비장애 학생들의 수비를 제한할 수 있다. 체육교사는비장애 학생의 골인에 1 점을, 장애 학생이 골에는 2 점을 득점할 수 있는 시스템을 허용할 수 있다. 농구 경기에서 체육교사는 장애 학생의 경우 3 걸음 이상을 드리블 없이 걸을 수 있도록 허용한다거나, 팀의 슈팅 전에 반드시 장애 학생에게 한번 이상 패스를 하도록 규칙을 변경할 수 있다.

예)
야구: T 볼 허용, 더블 드리블 제한, 득점 수 변형, 프리 드로우, 팀원수 조절, 게임 시각 변형. 3 루가 아닌 2 루만 적용, 또래 가이드 적용.
농구: 더블 드리블룰 제한, 득점수 변형, 레이업 슛 중 추가적인 스탭 허용, 프리 슈팅, 게임시간 변형, 팀원수의 증원.
축구: 자기방어를 위한 손 사용 허용, 해딩 금지, 걸으며 공, 제한된 지역내에서 머무르게 함, 프리 슈팅, 또래 교수 , 정지된 축구공을 차게 하는 것을 허용.

아래 동영상은 규칙 변형에 관한 것입니다.
동영상 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
동영상 2 (1:42): http://www.youtube.com/watch?v=IINPtv27C6o

당신은 위의 본문을 읽었습니까? 예 ( ) 아니오( )
당신은 동영상을 시청했습니까? 예( ) 아니오( )
만약 당신이 동영상을 시청했다면, 당신이 동영상에서 관찰한 규칙 변형에 대해서 두개 이상 기술하십시오.

( )

VII.환경변형(Environmental Modification)

환경 변형은 집중을 방해하는 요소들을 제한시키는 것, 시각효과의 최대화, 소음 제한, 조명 변형, 운동범위의 접근성 증대등의 환경적인 요소들을 변형시키는 것을 포함한다.
증가등이 있다.

야구 게임에서는,교사는 베이스 (일루-이루-삼루) 사이의 거리를 병형할 수 있다. 비장애 학생들은 일반 규격의 베이스 사이의 거리를 유지하는 반면, 장애 학생들은 베이스 사이의 거리를 좁혀주어 장애 학생들에게 더 많은 성공률을 제공해줄 수 있다. 농구 경기 에서 ,교사는 장애 학생 을위한 코트의 크기가 좁히거나, 또한 골 인정하는 영역을 확장할 수 있다.

예)
야구 : 밧줄로 베이스 (일루-이루-삼루) 사이를 연결함, 가드레일을 설치, 짧은 투구 거리 허용, 각 루(1 루-2 루-3 루) 간의 거리
농구 : 규격된 골대 대신 큰 박스나 큰 쓰레기통을 사용. 수정 코트 의 크기 변형 , 삼각대 혹은 콘(cone)으로 위치 선정.
축구 : 필드 크기 조정 , 표면이 부드러운 필드 선택, 모듬 활동 허용.

아래 환경변형에 관련된 동영상입니다.
동영상: (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

당신은 위의 본문을 읽었습니까? 예 ( ) 아니오( )
당신은 동영상을 시청했습니까? 예( ) 아니오( )
만약 당신이 동영상을 시청했다면, 당신이 동영상에서 관찰한 환경변형에 대해서 두개 이상 기술하십시오.
( )

APPENDIX IX. Self-efficacy Survey, English Version

Situational-Specific Self-Efficacy and Inclusion Students with Disabilities in Physical Education

Version 3.3 – May 17, 2010

Martin E. Block, Ph.D. University of Virginia, USA

Aija Klavina, Ph.D., Latvian Sports Academy, Latvia

Shayke Hutzler, Ph.D., Wingate University, Israel

Situational-Specific Self-Efficacy and Inclusion Students with Disabilities in Physical Education

Directions: This survey is designed to investigate your self-efficacy toward including a student with an intellectual, physical, or visual disability into your high school general physical education program. We define self-efficacy as your personal judgment of your competence or your confidence in your ability to carry out a goal or task (Bandura, 1986). In this case, we want to find your personal judgment of how confident you are in your ability to accommodate a student with an intellectual, physical, or visual disability who is included in your general physical education classes. The competency scale for each question is from 1 (no confidence) to 5 (complete confidence). There are no right or wrong answers, and every physical educator will answer these questions differently. We only want to find out how confident you feel in your ability to accommodate a student with an intellectual, physical, or visual disability, like the ones described below, into your general physical education class. The survey ends with some demographic questions. We are not asking for your name or any identifying information, so your participation is completely anonymous.

Part 1 – Intellectual Disability

Below you will see a description of a student with an intellectual disability. This will be followed by a series of questions about how competent/capable you feel about making certain accommodations for this student. You will then see a description of a student with a physical disability followed by another series of questions. Answer these questions as if this student is going to be in your general physical education class next week. The competency scale for each question is from 1 (cannot do at all) to 5 (highly certain can do).

****

Description of Student with an Intellectual Disability

Noah is a high school student with an intellectual disability, so he doesn't learn as quickly as his classmates. Because of his intellectual disability, he also doesn't talk very well, so sometimes it is hard to understand what he is saying. However, he will point or gesture to help people know what he wants. He also has trouble understanding verbal directions, particularly when the directions have multiple steps. Noah likes playing the same sports as his classmates, but he does not do very well when playing actual games. Even though he can run, he is slower than his peers and tires easily. He can throw, but not very far, and he can catch balls that are tossed directly to him. He likes soccer, but he cannot kick a ball very far, and he never can remember where to go on the field. He also likes basketball, but he does not have enough skill to dribble without losing the ball, and he is not coordinated enough to make a basket. He also does not really know the rules for basketball or other team sports, and he easily gets distracted and off task during the game.

****

Please rate **how certain you are that you can do the things listed below** by writing the appropriate number from 1-5 using the scale given below after each question.

1	2	3	4	5
No Confidence	Low Confidence	Moderate Confidence	High Confidence	Complete Confidence

Questions d-h: You are conducting a team sport unit such as volleyball, basketball, or soccer to your 9th grade physical education class of 30 students that includes Noah. You are in the first week of the unit, and you are teaching the basic skills of the sport (e.g., the bump, set, and serve in volleyball).

		Confidence (1-5)
d.	How confident are you in your ability to **modify your instructions to help Noah understand what to do** when teaching sport skills?	_____
e.	How confident are you in your ability to help Noah **stay on task** when teaching sport skills?	_____
f.	How confident are you in your ability to **modify equipment** to help Noah when teaching sport skills?	_____
g.	How confident are you in your ability to **modify the actual skills** to help Noah when teaching sport skills?	_____
h.	How confident are you in your ability to **instruct peers to help Noah** when teaching sport skills?	_____

Questions i-k: You are conducting a team sport unit such as volleyball, basketball, or soccer to your 9th grade physical education class of 30 students that includes Noah. You are in the last week of the unit, and you are now having your students play the actual game.

		Confidence (1-5)
i.	How confident are you in your ability to **modify rules of the game** for Noah?	_____
j.	How confident are you in your ability to help Noah **stay on task** during the game?	_____
k.	How confident are you in your ability to **instruct peers to help Noah** during the game?	_____

Situational-Specific Self-Efficacy and Inclusion Students with Disabilities in Physical Education

Part 4 – Demographic Questions

1. _____ Your age
2. _____ Your gender
3. _____ Your year in college (e.g., 2nd year, 3rd year, 4th year)
4. _____ Have you had a general physical education internship in a middle or high school?
5. _____ Coursework in adapted physical education (APE) (e.g., 1 course, 2 courses, etc.)
6. _____ Are you enrolled in an undergraduate minor or concentration in APE?
7. _____ Did your APE course have a practicum? (yes/no)
8. _____ If yes to #5 above, was the practicum (check all that apply):
    a. ___ working with a student with a disability 1-on-1 at your college/university?
    b. ___ working with a small group of students with disabilities at your college/university?
    c. ___ working with a student with a disability 1-on-1 in a local school?
    d. ___ working with a small group of students with disabilities in a local school?
    e. ___ assisting a student being included in a general physical education class?
    f. ___ volunteering for a community sport such as the Special Olympics?

9. What are your experiences with the following students with physical, intellectual, or visual disabilities in physical education or community sports?

	No experience	Once or twice	Several times
Intellectual disability	_____	_____	_____
Physical disability	_____	_____	_____
Visual disability	_____	_____	_____

10. What are your personal experiences with people with intellectual, physical, or visual disabilities?

	Family member	A friend	Someone at school
Intellectual disability	_____	_____	_____
Physical disability	_____	_____	_____
Visual disability	_____	_____	_____

APPENDIX X. Self-efficacy Survey, Korean Version

장애개념이해를강화를위한체육교육과커리큘럼내온라인교육도입

연구참여동의서

연구에참여하기로결정하기전이동의계약서를자세히읽어보십시오.

연구목적 : 본연구의목적은체육교육과커리큘럼내의온라인교육의효과를검증하기위한것입니다.

연구절차:모든피험자는두가지의사전검사,자기효능감설문지및관련지식테스트,를반드시치루어야합니다. 두가지 사전 검사 후 피험자는 세 그룹, (a)온라인그룹, (b) 유인물그룹, 혹은 (c) 통제 그룹, 증 힌 그룹에 배정될 것입니다. 온라인 그룹에 속한 피험자는 담당교수가 제시하는 통합체육교육에 대한 온라인교육프로그램을 수료할 것입니다. 유인물 그룹의 피험자의 경우 담당교수가 제공하는 통합체육교육에대한 유인물을 읽어야합니다. 통제그룹에 속한 피험자들은 그 어떤 교육도 받지않을 것입니다. 모든 피험자는 교육프로그램을 시작하기 전, 자기효능감 설문지 및 관련지식테스트 (사전검사)를 치룰 것이며, 교육 프로그램 후에도 자기효능감설문지 및 관련 지식테스트 (사후검사) 를 치룰 것입니다. 온라인그룹과 유인물그룹의 피험자들은 사후검사 후 교육프로그램 만족도 설문지를 제출하여야 합니다.

소요시간 : 온라인교육및유인물교육은, 35 – 45 분이소요됩니다. 자기 효능감설문지와 관련 지식테스트를 치루는 데 소요되는 시간은 약 15 –20 분이며, 프로그램 만족도 설문지를 완성하는데 소요되는 시간은 약 10 분으로 예상됩니다.

위험 : 본연구는예상되는위험은없습니다.

혜택: 본연구에참여하는피험자들에게주어지는혜택은없습니다.

기밀성 :연구에참여하는모든피험자가제공한모든정보는기밀로처리됩니다.사전사후검사의결과와피험자의 성명을일치시키기위해피험자의성명이요구됩니다. 사전,사 후 검사 및 만족도설문지를 마친 후 피험자의 성명은 코드화될 것 입니다. 모든 설문지는 연구자의 연구실에 보관될 것이며, 연구자는 설문지를 데이타분석후폐기될것입니다. 또한 실제 사용된 설문지는 모두 삭제될것입니다.

자발적인참여 : 본 연구의 참여는 자발적이며, 연구에 참여하지 않는 것을 선택하여도, 학점 및 기타 학업수행평가에 있어 부정적인 영향을 주지않을 것입니다. 모든 피험자는 언제든지 연구참여를 취소할수있습니다. 연구참여를 취소하고 싶디면 연구자혹은 담당교수에게 이메일을 보내십시오.

연구참여취소: 피험자는항시연구참여를취소할수있으며어떠한불이익을취하지않을것입니다.

연구참여취소방법: 만약 피험자가 본 연구의 참여를 취소하고 싶다면, 연구자에게 이메일을 보내십시오. 연구자는 피험자의 이메일확인 후 피험자의 모든 정보를 삭제할 것입니다. 이러한 과정 중 어떠한 불이익도 취하지 않을 것입니다.

금전적인보상: 본 연구에 대한 참여에 금전적인 보상을 받지않으며, 연구참여 취소시에도 위약금은 발생하지 않습니다.

본연구의참여를희망합니다.

성명 : 서명:

연구설계자 : 권은혜, 버지니아주립대학교체육교육과, 210 Emmet Street, 샬로츠빌. 버지니아 22904, 전화번호 +1 – 434– 218 –8112 ,이메일: ehk2v@virginia.edu

자기효능감설문지

본 설문은 통합체육환경에서 당신이 지적장애학생을 위한 수업환경, 기구, 규칙변형에 대한 당신의 자기효능감을 측정하기 위한것입니다. 자기 효능감이란 자신이 가지고있는 인지적, 사회적, 행동적 기능들을 통합하고 적용하는 기제로 구체적인 상황에서 과제를 수행할수 있다는 자신의 능력에 대한 개인적인 신념을 자기효능감이라고 합니다 (Bandura, 1986). 본 설문지에서는 통합체육수업시

지적장애학생을 위한 기자재, 규칙, 및 환경변경 (변형)을 당신이 얼만큼 수행할 수 있는지에 대한 자기효능에 대해 물어볼 것입니다.

아래 지적장애학생에 대한 설명을 참조하십시오. 이 지적장애학생에 대한 설명을 읽고 아래의 질문에 대답해 주십시오. 통합교육시 당신이 얼마나 이 지적장애 학생을 위해 특정한 변형(기자재, 규칙, 환경)을 할 수 있다고 느끼는지에대한 당신의 자기효능감 (당신의 능력에 대한 확신)을 기입해 주십시오. 이 지적장애학생이 다음 주에 당신의 체육수업에 참여했다고 가정하고, 본 통합체육교육에대한 당신의 효능감의 척도, 1 (전혀아니다) 에서 5 (매우그렇다) 를 표기해 주십시오.

****

지적장애 학생 설명

노아는 지적장애를 가진 고등학생입니다. 노아는 지적장애로 인해 동급생들보다 학습능력이 떨어집니다. 노아의 지적장애는 언어에도 영향을 미쳐, 대화를 하는 데 어려움이 있습니다. 그래서 가끔은 노아가 하는 말을 이해하기 힘듭니다. 그러나 노아는 손짓과 몸짓으로 의사를 표현할 수 있습니다. 또한 노아는 구두(句讀)로하는 설명 (verbal direction), 특히 설명이 여러단계로 이루어졌을 시 이해하는데 어려움이 있습니다. 노아는 급우들과 함께 팀스포츠경기에 참여하는 것을 좋아합니다. 하지만, 실제경기에 투입되었을 때 다른 급우만큼 기량을 펼치지 못합니다. 노아는 뛸 수 있지만, 다른 급우들보다느리고, 쉬지칩니다. 노아는 다른급우들 만큼 공을 멀리던지지 못하고, 정확하게 공을 받지도 못합니다. 노아는 축구를 좋아하지만, 축구공을 멀리차지 못하며, 어느 방향이 자신의 팀골대인지 기억하지 못합니다. 노아는 농구도 좋아합니다. 하지만, 여러 농구기술들, 드리블 및 패스 구사하는 데 어려움이 있습니다. 공을 놓치지않고 드리블을 할 수 없으며, 농구공을 골대까지 던질만큼 협응력이 좋지 않습니다. 특히 노아는 농구나 다른 팀 스포츠 경기의 규칙을 이해하지 못하고, 쉽게 경기 중 산만해지며, 집중력을 잃습니다.

아래의 질문들에 대해서 당신이 얼마나 확신을 가지고 있느냐에 대해서 1 에서 5 까지 적절한 숫자를 기입하시면 됩니다.

전혀그렇지않다.	대체로아니다.	그렇다.	대체로그렇다.	매우그렇다.
1	2	3	4	5

당신이 노아를 포함 30 명의 고등학교 1 학년 학생을 팀 스포츠 단원, 배구, 농구 또는 축구 등을 가르치고 있다고 가정합시다. 단원의 첫번째 주이고 당신은 스포츠의 기본기술 예를들어,농구드리블, 축구패스, 배구서브를 가르치고 있다고 가정합시다.

1. 당신은 노아에게 팀스포츠 기본 기술을 가르칠때, 노아가 기본 기술을 이해할 수 있도록 교수전략 ,설명 및 교육방법을 적절히 변형(modification)시킬 수 있습니까? ( )
2. 당신은 노아에게 스포츠의 기본기술을 가르칠 때, 노아가 산만해지지 않고, 수업에 계속 집중할 수 있도록 적절히 도와줄 수 있습니까? ( )
3. 당신은 노아에게 스포츠의 기본기술을 가르칠 때, 노아를위해기구 (공, 배트, 및골)를 적절히 변형(modification)할 수 있습니까? ( )
4. 당신은 스포츠 기술을 가르칠때 , 노아를 위하여 실제 기술을 적절히 변경시킬 수 있습니까?( )
5. 당신은 스포츠의 기술을 가르칠 때, 노아가 기술을 잘 이해할 수 있도록 또래교수법 (peer tutoring)를 적절히 적용할 수 있습니까? ( )

다음 세가지 질문의 경우 노아같은 학생를 포함한 30 명의 당신의 중학교 3 학년 체육수업에 배구, 농구 또는 축구등 팀스포츠 단원을 실시하고 상상해보십시오. 지금은 단원의 마지막 주이며, 이제 학생들이 실제 게임을 하고있습니다.

6. 당신은 노아가 급우들과 함께 게임에 참여할 수 있도록, 게임의 규칙을 적절히 변경할 수 있습니까? ( )
7. 당신은 노아가 게임참여시 산만해지지 않고, 게임에 계속 집중할 수 있도록 적절히 도와줄 수 있습니까? ( )

8. 당신은 노아가 게임에 참여할 수 있도록, 또래교수법(peer tutoring)을 적절히 적용할 수 있습니까?
   ( )

인구통계질문

1. 이름:
2. 나이:
3. 성별: 남 여
4. 학교에서체육교사로일한적이있습니까? (예 아니오)
5. 만약있다면얼마동안일했습니까?
6. 당신은특수체육을부전공으로하고있습니까? (예 아니오)
7. 당신은몇개의특수체육수업를들었습니까? (개)
8. 당신은특수체육을가르친경험이있습니까? (예 아니오)
9. 만약경험이있다면어떤경험을하였습니까? 모두고르세요.
   ( ) 대학에서 장애학생과 일대일로 교육
   ( ) 대학에서 소그룹 (5-7 명)의 장애학생들을 교육
   ( ) 초중고등학교에서 장애학생과 일대일 교육
   ( ) 초중고등학교에서 소그룹 (5-7 명) 의 장애학생들 교육
   ( ) 초중고등학교의 통합체육교육에서 보조교사
   ( ) 지역사회에서 장애학생 교육봉사

10. 당신은지적장애인을위한체육교육및체육활동교육을해본경험이있습니까?
   ( ) 전혀없다.
   ( ) 몇번있다 (5 회미만).
   ( ) 다수있다 (10 회이상).

11. 당신이체육교육혹은체육활동을가르친지적장애인과의관계는?
   ( ) 가족구성원
   ( ) 친구
   ( ) 학생혹은학교관련인물
   ( ) 없다

APPENDIX XI. Content Knowledge Test, English Version

General Information

Q1. Which of the following is correct regarding the definition of an intellectual disability;

a. The most important criteria for the diagnosis of an intellectual disability is a significant deficit in adaptive behaviors such as conceptual, social and practical adaptive skills
b. To be diagnosed with an intellectual disability one has to have significant limitations in intellectual functioning as well as in adaptive behaviors
c. The most important criteria for the diagnosis of an intellectual disability is an IQ below 70-75.
d. An intellectual disability is a disorder of neural development characterized by impaired social interaction, verbal and non-verbal communication, and by restricted and repetitive behavior.

Characteristics of intellectual disabilities

Q2. All of the following are common characteristics of students with intellectual disabilities except:

a. Slower at processing information (need to give student time to absorb the information presented)
b. Difficulty in understanding complex directions (best to keep directions simple or have a peer repeat directions to the student)
c. Cannot understand verbal cues (best to not use verbal cues and use visual supports such as picture schedules and task organizers
d. Difficulty attending to and focusing on key aspects of a skill (use strategies to help the student focus on key aspects of a demonstration)

Q3. A student with intellectual disabilities who has learned how to perform a skillful overhand throw in an instructional setting would demonstrate generalizability when;

a. Demonstrating an ability to do an underhand throw as well
b. Demonstrating an overhand throw in a difference setting such as in a game of softball
c. Demonstrating the skill independently without any extra cues
d. Demonstrating an increase in how far the student can throw after continued practice

Teaching strategies

Q4. You want to teach a student to master the underhand serve in your volleyball unit. When teaching a skill like the underhand serve to students with intellectual disabilities, the teacher should plan for frequent intervals of time:

a. For students to get extra practice to truly master the skill
b. For students to discuss the application of content such as when to serve short or long to the opposing team
c. Devoted to explanation to students regarding the importance of lesson content such as why serving is important in the game of volleyball

d. Devoted to focusing on one specific component at a time such as teaching stepping with the opposite first, and then teaching swinging arm back second, then teaching where to contact ball when serving, and so forth until all components are taught

Q5. You are in the beginning of your 4-week soccer unit with your 10th grade physical education class. You are working on shooting technique, and you are worried that your student with an intellectual disability does not understand the correct components of shooting. You have 30 other students in the class, so working with this student one-one-one is really not feasible. What is the best way to help this student receive information on the proper technique for shooting a soccer ball?

a. Write out the components on a piece of paper and give it to the student as a reminder
b. Ask the special education teacher to send a teacher assistant from the classroom to work with the student
c. Provide a larger goal so the student will be more successful when shooting
d. Assign a peer who already mastered the components of shooting to review the components and provide feedback

Q 6. Suggestions for increasing attention span for students with intellectual disability include:

a. Increasing level of difficulty of activity which will force the student to focus
b. Having other activities occurring simultaneously to help the student stay focused
c. Use regular equipment since regular equipment will be more motivating and help the student focus
d. Increasing the intensity of the external stimuli such as using a bright colored ball or a target that moves or makes noise

Rule modification

Q7. It is important to determine the level of intellectual development of students with disabilities when selecting activities that;

a. Have rules that can be made more or less complex
b. Have skills that can be taught using whole-part-whole method
c. Have skills requiring moderate levels of physical fitness
d. Have simple motor skills

Q8. Mary has an intellectual disability. She has little communication skills, and needs extra direction to understand what to do in game situations. In the softball unit, Mary is able to hit a tossed softball but does not run to first base promptly. Which modification could increase participation and success in softball game with peers?

a. Use guide rope from home to first base
b. Give an immediate verbal cue to run when the ball is hit, and then have the first base person call Mary's name and tell her to run to first base
c. Have another student run to first base in place of Mary
d. Use cones as bases to make where to run clearer for Mary

Q9. Nora is 9th grader with an intellectual disability who has pretty good motor skills but very little understanding of what to do in game situations. It is the end of your basketball unit, and you are now playing 5 v 5 games. Nora is included in the basketball game with her peers without disabilities. Which of the following would have the least impact on the game for her peers but still allow Nora to participate successfully in the game?

a. Making a rule that Nora has to touch the ball every other pass when her team has the ball
b. Allowing Nora to double dribble and travel without calling a violation
c. Using a larger, Nerf basketball rather than a regular basketball during the game
d. Giving everyone free passes and not allowing anyone to steal from anyone during the game.

Equipment modification

Q10. You are teaching children how to catch a chest pass in basketball, and you want to make sure a student is successful in his early attempts to keep him motivated to continue to practice catching. At the same time, you do not want him to look too different from his peers. Which of the following is the best way to ensure the student will be successful in his early attempts?

a. Use a woman's size basketball which is slightly smaller than a regulation basketball but still has the feel of a real basketball.
b. Use a regulation basketball, because the student will feel more like his peers and be more motivated
c. Use a beach ball which is soft and easy to catch and more interesting for the student
d. Use a tennis ball since it is smaller and softer than a basketball making it easier to catch

Q11. Susan is a 13 years old girl with an intellectual disability and severe motor delays including problems with coordination and strength. At the end of the softball unit, she is participating in the softball game with her peers. In the game, what is the most appropriate modification in batting?

a. bat using a T with a regular size ball with a regular size and weighted bat
b. bat using a T with a larger size ball with a regular size and weighted bat
c. bat using a T with a regular size ball with a larger, lighter bat
d. bat using a T with a larger size ball with a larger, lighter bat

Q12. You are planning a basketball unit for your 8th grade class that includes a student with an intellectual disability who has motor delays compared to his same-aged peers. Which of the following equipment considerations is most appropriate for this student with the intellectual disability?

a. Use a smaller size basketball since most students with ID are smaller and have smaller hands than peers without ID
b. Use only regular basketballs so the student with ID does not feel different from his peers
c. Allow the student to choose a ball he/she feels would provide the most success in dribbling or shooting
d. Use a lighter ball such a Nerf ball for dribbling

Environmental Modification

Q13. You have a student who seems to have trouble understanding where to step when pitching in softball. Which of the following environmental modifications is the best way to help this student master this stepping when throwing?

a. Say "step" each time the student is gets ready to pitch
b. Have the student watch a peer every time he pitches so he sees proper stepping
c. Use foot prints to cue the student to step when pitching
d. Show the student a picture of another student stepping when throwing

Q14. If a PE teacher wants a student with an intellectual disability to learn to strike a pitched softball, then the PE teacher should provide variable practice by:

a. Keeping the toss the same every time so the student will be successful
b. Varying the size of the ball
c. Toss the ball at different trajectories so student gets used to adjusting to the ball
d. Have foot prints to help the student know where to step when swinging.

Q15. You are using stations to teach basketball skills. You have a dribbling station, shooting station, passing station, and defense station. You have a student with an intellectual disability who like many students with intellectual disabilities also has attention problems. Which of the following is the most appropriate modification to stations to help this student be most successful?

a. Set up stations on one side of the gym so it is easier for you to monitor the student with intellectual disability
b. Have only three instead of four stations
c. Have the student only do two of the four stations so he will have more time to practice skills at the two stations.
d. Use partitions to reduce the ability of the student to see students at other stations

Yout name ( )

APPENDIX XII. Content Knowledge Test, Korean Version

지적장애인 기본정보

Q1. 아래 지적 장애에 대한 정의 중 틀린 것을 고르시오.

1. 지적장애인으로진단내려지는가장중요한요소는일상적인사회적및실제적인기술을포함하는적응행동 모두에심각한제한을보이는것이다.
2. 지적장애인으로진단내려지기위해, 지적능력및적응행동상의심각한제한을보여야한다.
3. 지적장애인으로판단되는가장중요한판단기준은아이큐점수이다.
4. 지적 장애는신경발달 장애로서 사회적 상호 작용, 언어 및 비언어 적 의사 소통 및 제한적 그리고 반복적인 행동을 동반한다.

지적장애인의 특성

Q2. 다음중 지적 장애 학생들이 가진 일반 적인 특징이 아닌 것을 고르시오.

1. 정보처리가느리다 (제공된정보를흡수하는데시간을주어야한다).
2. 복잡한지시를이해하는데어려움이있다(간단한지시를쓰는것이가장좋으며, 지시를반복해서주입해줄수있는또래를제공한다).
3. 구두로제시된짧은지시를이해하지못한다(짧은 구두 지시 대신 사진을 사용한 계획표나 지시서와 같은 시각적인 자료를 이용하는 것이 효과적이다).
4. 중요한 내용에 참여하지 못하거나 집중하지 못한다. (시연이 있을 경우 학생들의 집중도를 높이기 위해 여러 방법들을 사용할 필요가 있다)

Q3. 지적장애를 가진 학생이 수업 중 야구의 야구공 던지기 (피칭, 오버스로)를 배웠을 때 아래의 경우 중 어느 때 일반화 가능성을 보여주는가

1. 언더핸드도 던질 줄 알게 됐을 때
2. 소프트볼 게임에서도 오버스로를 던질 때
3. 추가적인 지시 없이 스스로 오버스로를 던질 때
4. 연습을 계속해서 오버스로를 더 멀리 던지게 됐을 때

교수전략

Q4. 지적 장애 학생이 포함된 배구팀 선수들이 언더핸드 서브를 완벽히 익히는 것을 목표로 할 때, 교사는 누구를 위해 비교적 자주 쉬는 시간을 가져야 하는가?

1. 해당 기술을 정말로 완벽하게 익히기 위해 추가로 연습하는 학생들을 위해
2. 서브 시점 같은 기술적인 토론을 하는 학생들을 위해
3. 서브의 중요성 같은 배구의 규칙을 학생들에게 상세하게 설명하기 위해서
4. 배구 동작의 모든 요소(예: 발동작, 팔동작, 서브 시 손 닿는 공의 적절한 위치 등)를 다 가르치기 위해

Q5. 당신은 고등학교 1 학년 학생들의 체육 수업 진행 중 4 주 짜리 축구 프로그램 초기 단계에 있다. 지금 가르치고 있는 기술은 공차기인데 지적 장애 학생이 설명을 잘 알아듣는지 염려가 된다. 수업인원이 30 명이기에 일대일로 봐주는 것은 불가능하다. 이 상황에서 지적 장애 학생에게 축구의 공차기 기술을 적절하게 전달하려면 어떤 방법이 제일 좋을까?

1. 종이에 주의사항을 적어 학생들에게 참고용으로 나눠준다
2. 특수 교육 선생님에게 지원을 요청해 수업 중 지적 장애 학생을 같이 지도 한다.
3. 더 큰 골대를 제공해서 지적 장애 학생이 쉽게 골인을 할 수 있도록 한다.
4. 이미 해당 기술을 완벽히 습득한 반 친구를 지적 장애 학생에게 배정해서 공차기 기술을 복습을 도와주고 피드백을 주도록 한다.

Q 6. 지적 장애 학생의 주의집중시간을 늘이기 위한 가장 적절한 교수전략은?

1. 난이도를 높여 해당 학생이 집중할 수 밖에 없는 분위기를 만든다
2. 동시에 여러 가지 내용을 진행해서 학생이 집중을 지속할 수 있게 한다

3. 일상적으로 사용하는 기구들을 이용해 학생들을 더욱 집중하게 하고 동기부여 한다.
4. 밝은 색깔의 공이나 소리가 나는 공을 이용해 지적 장애 학생에게 외부적인 자극을 더 준다.

규칙 변형

Q7. 수업시간에 활동을 선택시 해당 학생의 지적 장애 정도에 기인해고려해야할 사항은

1. 규칙을 더 어렵게 혹은 더 쉽게 바꿀 수 있다.
2. 부분 연습을 먼저 한 뒤 전체적으로 연습이 가능한 기술들
3. 게임이 요구하는 체력
4. 단순한 운동기능으로 할 수 있는 게임인지

Q8. 석호는 지적장애가 있다. 의사소통 기술도 부족한 편이며 게임 시 상황 판단도 약하다. 소프트볼 팀에서 석호는 자기에게로 토스된 공을 칠 순 있지만 일루로 빨리 달리지를 못 한다. 학급 동료들과 같이 게임을 같이 즐기고 석호의 참여도를 높이기 위해 무엇을 해야할까?

1. 홈에서 일루까지 밧줄로 이어 놓는다.
2. 석호가 공을 치자마자 누군가 말로 달려야 함을 신호로 알려준다. 아울러 일루에 있는 학생도 메리에게 그 쪽으로 달려오라고 말해준다.
3. 다른 학생을 석호 대신 뛰게 한다.
4. 삼각대 (혹은 삼각콘)을 사용해 석호가 뛰어야 할 곳을 표시한다.

Q9. 민선이는 운동 능력은 좋지만 게임을 잘 이해하지 못 하는 중학교 3 학년의 지적 장애 학생이다. 지금 농구 시합은 거의 끝날 시점이고 점수는 5 대 5 이다. 노라 팀의 다른 학생들은 지적장애가 없다. 노라가 게임에 더 잘 참여하게 유도하는 동시에 다른 친구들의 플레이에도 영향을 가장 적게 주는 방법은 무엇일까?

1. 민선이의 팀이 공을 가지고 있을 때면 꼭 노라가 공을 터치하도록 한다.
2. 민선이가 더블 드리블을 해도 반칙을 선언하지 않는다.
3. 보통 농구공보다 더 큰공 (널프공)을 사용한다.
4. 모두에게 프리 패스를 주고 게임을 하는 동안 상대방의 공을 낚아채는 것을 금한다.

기자재 변형

Q10. 당신은 농구의 가슴 패스를 잡는 방법을 아이들을 가르치고, 동기부여 상태를 유지하기 위해 학생들의 초기 시도를 성공적으로 이끌고 싶다. 동시에 지적 장애 학생의 다른 면모를 너무 부각하고 싶지도 않다. 다음 중 학생이 초기 연습에서 성공할 수 있도록 하는 가장 좋은 방법은?

1. 규칙 상 정해진 농구공보다 약간 작은 여자용 농구공을 이용한다.
2. 다른 학생들과 동일한 공을 사용함으로써 지적장애학생에게 동질감과 동기부여를 준다.
3. 잡기 쉽고 아이들이 좋아하는 비치볼을 사용한다.
4. 잡기 쉽도록 작고 부드러운 테니스 공을 사용한다.

Q11. 미현은 지적 장애와 심각한 운동 능력 장애 가지고 있으며, 협응력과 체력 등 운동 기능에도 문제가 있는 13 세 소녀이다. 미현이 학우들과 함께 소프트볼 게임에 참가할 때, 공을 칠 때 미현에게 필요한 가장 적절한 수정은 무엇입니까?

1. 일반 크기 공과 보통 크기 및 무게의 배트 사용
2. 비교적 큰 공과 보통 크기 및 무게의 배트 사용
3. 일반 공과 크고 가벼운 배트 사용
4. 큰 공과 크고 가벼운 배트 사용

Q12. 당신은 자신의 동일한 나이 또래에 비해 운동 기능이 쳐지는 지적 장애 학생을 포함한 8 학년 클래스의 농구팀을 계획하고 있다. 다음과 같은 기자재 변형 사항 중 지적 장애를 가진 학생이 가장 적합한 것은 어떤 것인지?

1. 대부분의 지적 장애 학생들은 키와 손이 작은 편이므로 작은 크기의 농구공을 사용한다.
2. 보통 공을 사용해서 지적 장애 학생이 다른 학생과 다르다는 느낌을 받지 않도록 한다.

3. 학생들에게 드리블이나 슈팅을 할 때 가장 좋은 결과를 내는 공을 스스로 고르도록 한다.
4. 널프공 (Nerf ball))과 같이 드리블 시 가벼운 공을 사용한다.

환경 변형

Q13. 당신이 가르치는 반에 소프트볼에서 투구 할 때 어떻게 발을 디뎌야 하는지 잘 이해 못하는 학생이 있다. 다음과 같은 예시 중 어느 경우가 이 학생이 스텝을 익히는 데 가장 도움이 될까?

1. 해당 학생이 투구를 할 때마다 '스텝'이라고 외쳐준다.
2. 해당 학생이 스텝을 잘 하는 다른 학생을 계속 관찰하도록 한다.
3. 해당 학생이 따라할 수 있도록 발자국 모양을 그려놓는다.
4. 다른 학생이 투구 시 스텝을 하는 모습의 사진을 보여준다.

Q14. 체육 선생님이 지적 장애 학생에게 날아온 소프트볼 공 치는 법을 가르칠 때 아래 중 어떤 방법이 다양한 연습을 제공할 수 있는가

1. 토스를 유지해서 학생이 계속 공을 성공적으로 칠 수 있게끔 한다
2. 다양한 크기의 공을 준비한다
3. 학생에게 다양한 각도에서 공을 던져 이에 익숙해지게 하기
4. 투구 시 스텝에 도움을 줄 수 있게 발자국 표시를 해놓는다.

Q15. 당신은 학생들에게 농구를 가르치기 위해 네 가지(드리블링, 슈팅, 패싱, 방어)의 스테이션을 사용하고 있다. 이 중 지적장애학생이 있는데 많은 경우에 그렇듯 주의력 결핍도 같이 겪고 있다. 아래의 스테이션 수정 방안 중 이 학생에게 가장 효과적인 것은 무엇일까?

1. 스테이션들을 체육관 한편에만 설치해 선생님이 지적장애학생을 쉽게 지켜볼 수 있게 한다.
2. 네 개의 스테이션을 세 개로 줄인다.
3. 학생들에게 네 개 스테이션 모두를 연습하는 대신 두 개만 하도록 해서 집중 효과를 높인다.
4. 학생들이 자기 연습에만 집중할 수 있도록 스테이션 사이에 칸막이를 설치한다.

성명 ( )

APPENDIX XIII. Satisfaction Survey – Traditional Group, English Version

1. This hand-out has clear print, pictures, and video-links I expect it to have

Strongly disagree Strongly agree

1 2 3 4 5 6 7

2. Overall, I am satisfied with how easy it is to use information in the hand-out

Strongly disagree Strongly agree

1 2 3 4 5 6 7

3. I felt comfortable using this hand-out for reading the material and watching the videos

Strongly disagree Strongly agree

1 2 3 4 5 6 7

4. The display of this hand-out was pleasant

Strongly disagree Strongly agree

1 2 3 4 5 6 7

5. The information provided for the hand-out was easy to understand

Strongly disagree Strongly agree

1 2 3 4 5 6 7

6. The information was effective in helping me complete the tasks and scenarios

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Question 7-26. This question is about the videos on the hand-out. This question is to indicate the effectiveness of the watching videos in each section. Please tell us if you did not watch the videos (be honest, it is OK if you chose not to watch the videos). As a reminder, there is no penalty to your grade in this class for not watching videos, and the only the researcher will review results of this survey.

Q 7-10. Characteristics of Intellectual Disability

7. Did you watch the video in the section, Characteristics of Intellectual Disability?

Link: http://www.youtube.com/watch?v=-6-J_YcVRi4
Yes ( ) No ( )

If you watched the video, tell me about your experience

8. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

9. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

10. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 11-14. Teaching Strategies.

11. Did you watch the video in the section, Teaching Strategies?

Link 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
Link 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8
Link 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

I watched them all ( )
I watched 1-2 videos ( )
I did not watch them at all ( )

If you watched the video, tell me about your experience

12. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

13. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

14. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 15-18. Equipment Modification

15. Did you watch the video in the section, Equipment Modification?

Link: http://www.youtube.com/watch?v=-6-J_YcVRi4
Yes ( ) No ( )

If you watched the video, tell me about your experience.

16. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

17. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

18. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 19-22. Rule Modification

19. Did you watch the video in the section, Rule Modification?

Link 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
Link 2 (1:42): http://www.youtube.com/watch?v=IlNPtv27C6o

I watched them all ( )
I watched one ( )
I did not watch them at all ( )

If you watched the video, tell me about your experience

20. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

21. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

22. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 23-26. Equipment Modification

23. Did you watch the video in the section, Equipment Modification?

Link 1 (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

Yes ( )
No ( )

If you watched the video, tell me about your experience.

24. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

25. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

26. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

APPENDIX XIV. Satisfaction Survey Traditional Group, Korean Version

100%

Exit Survey

유인물 만족도 설문지

본 연구에 참여해 주셔서 감사합니다. 본 설문지는 학생 여러분의 제공되었던 유인물에 대한 여러분의 만족도를 조사하기 위해 개발되었습니다. 본 설문지의 결과는 연구자만이 열람할 수 있으며 비밀이 보장됩니다. 최대한 정직하게 대답해주시기 바랍니다.
시간내주셔서 감사합니다.

1. 유인물의 프린트 상태가 깨끗했고, 사진과 비디오 링크도 쉽게 볼 수 있었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

2. 전반적으로, 유인물에 있는 내용을 쉽게 이해할 수 있었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

3. 유인물의 내용을 읽고, 비디오를 시청하는데 편리했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

4. 유인물 내용의구성이 한눈에 들어와 보기 편안했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

5. 유인물의 내용이 이해하기 쉬웠습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다

	○	○	○	○	○	○	○

6. 유인물에 나와있는 내용이 사후검사(post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

아래 문제들은 온라인 강좌에 제시되었던 비디오에 대한 것입니다.

각 단원의 비디오가 온라인 강좌의 내용을 이해하는데 효과적이였는지 당신의 비디오에 대한 만족도를 1 (매우 그렇다) 에서 7 (전혀 그렇지 않다) 로 기입해주십시오 .

만약에 비디오를 시청하지 않았다면 정직하게 '아니오'라고 대답해주십시오. 이 만족도 검사는 연구자만이 열람할 수 있으며, 피험자들에게 어떤 손실이나 손해도 없을 것입니다.

Q7-10)지적 장애 학생의 특징

7. 당신은 아래 링크의 동영상을 시청하였습니까?
동영상: http://www.youtube.com/watch?v=-6-J_YcVRi4

○ 예

○ 아니오

만약 당신이 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.
8. 동영상의 내용이 지적장애인의 특징을 이해하는 데 도움이 되었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

9. 온라인 강좌에서 제공했던 동영상의 화질이 선명했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

10. 위 동영상의 시청이 사후검사 (post-test)를 더 잘 치루는데 도움이 되었습니까?

	1 전혀 그렇지	2	3	4	5	6	7 매우 그렇다

	않다						
	○	○	○	○	○	○	○

Q11-14) III 지적 장애인을 위한 교수 전략
11.당신은 아래 동영상을 시청하였습니까?
동영상 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
동영상 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8
동영상 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

○ 예

◉ 아니오

당신이 만약에 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.
12.동영상의 내용은 지적 장애인을 위한 교수전략을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

13.동영상의 화질이 선명하였습니까?.

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

14.동영상을 시청하는 것이 사후 검사 (post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

Q 15-18) II. 기자재 (예; 공 및 배트) 의 변형 (Equipment Modification)

15. 당신의 기구 변행에 대한 동영상을 시청하였습니까?
동영상(3:18): http://www.youtube.com/watch?v=Gh86OiF7OtY

○ 예

○ 아니오

당신이 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.
16. 동영상의 내용은 기자재 변경을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

17. 동영상의 화질이 좋았습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

18.동영상을 시청하는 것이 사후 검사 (post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

Q 19-22) III. 규칙 변형 (Rule modification)

19.당신은 아래의 동영상을 시청하였습니까?

동영상 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
동영상 2 (1:42): http://www.youtube.com/watch?v=IlNPtv27C6o

○ 예

○ 아니오

만약 당신이 동영상을 시청하였다면 아래의 질문에 대답해 주십시오.
20.본 동영상을 시청하는 것이 온라인 강좌의 내용 (규칙변형)을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

21. 동영상의 화질이 선명했습니까?

	1 전혀 그렇지	2	3	4	5	6	7 매우 그렇다

	않다						
	○	○	○	○	○	○	○

22.동영상을 시청했던 것이 사후검사 (post-test)를 더 잘 치루도록 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

Q23-26) 환경변형(environmental modification)
23.당신은 아래의 환경 변형에 관련 동영상을 시청하였습니까?

동영상: (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

○ 예

○ 아니오

24.본 동영상을 시청하는 것이 환경 변형을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

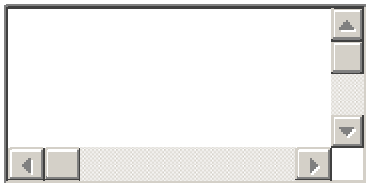
25.동영상의 화질이 선명했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

26.동영상을 시청했던 것이 사후검사 (post-test)를 더 잘 치루도록 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

성명



APPENDIX XV.Satisfaction Survey - E-learning Group, English Version

1. This e-learning module has all the functions and capabilities I expect it to have

Strongly disagree Strongly agree

1 2 3 4 5 6 7

2. Overall, I am satisfied with how easy it is to use this e-learning module

Strongly disagree Strongly agree

1 2 3 4 5 6 7

3. I could effectively complete the tasks and scenarios using this e-learning module

Strongly disagree Strongly agree

1 2 3 4 5 6 7

4. The interface of this e-learning module was pleasant

Strongly disagree Strongly agree

1 2 3 4 5 6 7

5. The organization of information on the e-learning module screen was clear

Strongly disagree Strongly agree

1 2 3 4 5 6 7

6. The e-learning system gave error messages that clearly told me how to fix problem

Strongly disagree Strongly agree

1 2 3 4 5 6 7

7. Whenever I made a mistake using the e-learning system, I could recover easily and quickly

Strongly disagree Strongly agree

1 2 3 4 5 6 7

8. The information provided for the e-learning module was easy to understand

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Question 9-28. This question is about the videos on e-learning module. This question is to indicate the effectiveness of the watching videos in each section. Please tell us if you did not watch the videos (be honest, it is OK if you chose not to watch the videos). As a reminder, there is no penalty to your grade in this class for not watching videos, and the only the researcher will review results of this survey.

Q 9-13. Characteristics of Intellectual Disability

9. Did you watch the video in the section, Characteristics of Intellectual Disability?

Link: http://www.youtube.com/watch?v=-6-J_YcVRi4
Yes ( )
No ( )

If you watched the video, tell me about your experience

10. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

11. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

12. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 13-16. Teaching Strategies.

13. Did you watch the video in the section, Teaching Strategies?

Link 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
Link 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8
Link 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

I watched them all ( )
I watched 1-2 videos ( )
I did not watch them at all ( )

If you watched the video, tell me about your experience.

14. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

15. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

16. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 17-20. Equipment Modification

17. Did you watch the video in the section, Equipment Modification?

Link: http://www.youtube.com/watch?v=-6-J_YcVRi4

Yes ( )
No ( )

If you watched the video, tell me about your experience

18. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

19. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

20. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 21-23. Rule Modification

21. Did you watch the video in the section, Rule Modification?

Link 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
Link 2 (1:42): http://www.youtube.com/watch?v=IlNPtv27C6o

I watched them all ( )
I watched one ( )
I did not watch them at all ( )

If you watched the video, tell me about your experience.

22. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

23. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

24. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree Strongly agree

1 2 3 4 5 6 7

Q 25-28. Equipment Modification

25. Did you watch the video in the section, Equipment Modification?

Link 1 (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

Yes ( )
No ( )

If you watched the video, tell me about your experience

26. The content of the videos was helpful in understanding the content of the supplement

Strongly disagree Strongly agree

1 2 3 4 5 6 7

27. The quality of the videos were very good

Strongly disagree Strongly agree

1 2 3 4 5 6 7

28. Do you agree watching the videos were effective in helping me better prepare me to take the post content knowledge test?

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

APPENDIX XVI. Satisfaction Survey - E-learning Group, Korean Version

만족도 조사 - 온라인그룹

본 만족도 조사 설문지는 당신이 학습했던 온라인 강좌에 대한 만족도를 측정하기 위해 개발되었습니다. 문제를 잘 읽고, 온라인 강좌에 대한 당신의 만족도를 1(전혀 그렇지 않다) 에서 7 (매우 그렇다) 순으로 기입해주십시오.

1. 본 온라인 강좌에서 제공되는 모든 기능은 편리했으며, 사진과 비디오 링크도 쉽게 볼 수 있었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

2. 전반적으로, 온라인 강좌에 있는 내용을 쉽게 이해할 수 있었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

3. 온라인 강좌의 내용을 읽고, 비디오를 시청하는데 편리했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

4. 온라인 강좌의 내용 구성이 한눈에 들어와 보기 편안했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

5. 온라인 강좌의 내용이 이해하기 쉬웠습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

6. 온라인 강좌에 나와있는 내용이 사후검사(post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

7. 온라인 강좌 수강시 에러 메세지 (error message)가 나타난 적이 있으며, 어떻게 복구되는지에 대해서 자세하게 설명하였습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

8. .당신이 온라인 강좌 시스템을 잘못 수행했을 시, 쉽게 바로 복구할 수 있었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

아래 문제들은 온라인 강좌에 제시되었던 비디오에 대한 것입니다.

각 단원의 비디오가 온라인 강좌의 내용을 이해하는데 효과적이였는지 당신의 비디오에 대한 만족도를 1 (매우 그렇다) 에서 7 (전혀 그렇지 않다) 로 기입해주십시오 .

만약에 비디오를 시청하지 않았다면 정직하게 '아니오'라고 대답해주십시오. 이 만족도 검사는 연구자만이 열람할 수 있으며, 피험자들에게 어떤 손실이나 손해도 없을 것입니다.

Q9-12)지적 장애 학생의 특징

9. 당신은 아래 링크의 동영상을 시청하였습니까?
동영상: http://www.youtube.com/watch?v=-6-J_YcVRi4

○ 예

○ 아니오

만약 당신이 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.

10. 동영상의 내용이 지적장애인의 특징을 이해하는 데 도움이 되었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

11. 온라인 강좌에서 제공했던 동영상의 화질이 선명했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

12. 위 동영상의 시청이 사후검사 (post-test)를 더 잘 치루는데 도움이 되었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

Q13-16) III 지적 장애인을 위한 교수 전략
13.당신은 아래 동영상을 시청하였습니까?
동영상 1 (0:38): http://www.youtube.com/watch?v=0mclCO3wsQM
동영상 2 (0:11): http://www.youtube.com/watch?v=cczGi8zOOY8
동영상 3 (2:06) : http://www.youtube.com/watch?v=Ium0J7hXQLs

○ 예

○ 아니오

당신이 만약에 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.

14.동영상의 내용은 지적 장애인을 위한 교수전략을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

15.동영상의 화질이 선명하였습니까?.

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.

	○	○	○	○	○	○	○

16.동영상을 시청하는 것이 사후 검사 (post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다.	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

Q 17-20) II. 기자재 (예; 공 및 배트) 의 변형 (Equipment Modification)

17.당신의 기구 변행에 대한 동영상을 시청하였습니까?
동영상(3:18): http://www.youtube.com/watch?v=Gh86OiF7OtY

○ 예

○ 아니오

당신이 동영상을 시청했다면, 아래의 질문에 대답하여 주십시오.

18.동영상의 내용은 기자재 변경을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

19. 동영상의 화질이 좋았습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

20.동영상을 시청하는 것이 사후 검사 (post-test)를 더 잘 치루는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

Q 21-24) III. 규칙 변형 (Rule modification)

21.당신은 아래의 동영상을 시청하였습니까?

동영상 1 (3:12): http://www.youtube.com/watch?v=aPFNR0hnmDQ
동영상 2 (1:42): http://www.youtube.com/watch?v=IlNPtv27C6o

- 예
- 아니오

만약 당신이 동영상을 시청하였다면 아래의 질문에 대답해 주십시오.

22.본 동영상을 시청하는 것이 온라인 강좌의 내용 (규칙변형)을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	◉	○

23. 동영상의 화질이 선명했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

24.동영상을 시청했던 것이 사후검사 (post-test)를 더 잘 치루도록 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다
	○	○	○	○	○	○	○

Q25-28) 환경변형(environmental modification)

25.당신은 아래의 환경 변형에 관련 동영상을 시청하였습니까?

동영상: (3:48):http://www.youtube.com/watch?v=FLMECVRU6LE

- 예
- 아니오

26.본 동영상을 시청하는 것이 환경 변형을 이해하는 데 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

27.동영상의 화질이 선명했습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

28.동영상을 시청했던 것이 사후검사 (post-test)를 더 잘 치루도록 도움을 주었습니까?

	1 전혀 그렇지 않다	2	3	4	5	6	7 매우 그렇다.
	○	○	○	○	○	○	○

성명