

## A Study on Pre-service Teachers' Satisfaction on Adapted Physical Education E-learning Supplement

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### Abstract

*This study investigated pre-service teachers' level of satisfaction toward two different format of Adapted Physical Education (APE) instructional supplement in Physical Education Teacher Education (PETE) course. The APE instructional supplement about inclusion strategies for individuals with Intellectual Disability (ID) was developed based on instructional design model (Dick, Carey, & Carey, 2005). Two groups of pre-service teachers (N=50) took the same content supplement with different delivery system, E-learning group (n=25) with online, traditional group (n=25) with the printed handout. A modified Post-Study System Usability Questionnaire (PSSUQ) measured the level of satisfaction toward the supplement. The 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). On the 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). 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).*

**Keywords:** physical education teacher education, adapted physical education, blended learning, e-learning instructional supplement, student satisfaction

### Introduction

In the early 1990s, apprehension about the inadequate state of teachers' preparation in working with students with disabilities in General Physical Education (GPE) classes prompted studies that used the infusion approach in Physical Education Teacher Education (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). 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; Hardin, 2005; Lepore & Kowalski, 1992). There is evidence that the infusion approach curriculum positively correlates with attitudes and beliefs of pre-service teachers. However, there are still barriers in developing an infusion approach curriculum. Time pressure was a major constraint; faculty had to work within limited lecture hours, and students were overextended (Power 2004). 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. One of the suggested strategies to implement infusion approach curriculum in PETE courses is 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.

Some researchers 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 inferior 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).

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.

As discussed, several studies indicated the benefits of blended learning (Dean, Stahl, Sylwester, & Peat, 2001). However, only two studies have been searched with "Physical Education Teacher Education" under "Online education" and "Blended learning". First, Tinning and Evans (1994) conducted a case study regarding distance education in PE. 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 Howell (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, Kutztown 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.

The blended learning approach implementing e-learning delivery was introduced as an alternative instructional method. Even though blended learning could be an ideal strategies for implementing APE infusion approach curriculum in PETE program combining elements of e-learning courses in face-to-face course, there is lack of studies investigate how students satisfied with the format of e-learning instructional supplement. The purpose of the study was to explore the level of preservice teachers' satisfaction toward blended learning implementation in PETE courses would have an impact on 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 to measure the level of satisfaction regarding using two different types of instructional supplements.

### **Methods**

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.

## ***Developing instructional supplement***

### ***Stage 1. Identifying an instructional goal***

GPE teachers had more difficulties when they included students with learning/intellectual disabilities (ID) 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. As a result, 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.

### ***Stage 2. Conducting an instructional analysis***

To investigate the content of the supplement, three experts in APE reviewed the content to determine priority for content subarea with results as follows: Instructional strategies (20%) equipment modification (20%), rule modification (20%), environmental modification (15%), characteristics of ID (13%), and basic information of ID (12%). The subareas contained videos showing how PE teachers modify equipment, rules, and the environment to accommodate a student with ID.

### ***Stage 3. Identifying entry behaviors and characteristics***

To determine participants' eligibility 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.

### ***Stage 4. Writing the performance objectives***

The main objective was as follows: 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.

### ***Stage 5. Instructional material***

Based on the suggestions of the experts in APE and in PE pedagogy, the final instructional materials including videos used in the module.

### ***Stage 6. Designing and conducting the evaluation***

The content knowledge test was developed by the PI to determine the entry level of all participants. The content knowledge test consisted of fifteen items. The number of questions on each section was determined by the experts' rating of importance/percentage in stage 2.

### ***Stage 7. Summative evaluation***

Summative evaluation of this module was the satisfaction survey of the supplement. 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. 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).

The supplement contained videos showing how PE teachers modify equipment, rules, and the environment to accommodate a student with ID. Watching these videos could provide examples of vicarious experiences for participants. A total of eight videos were presented in the supplement. Video 1 described the characteristics of individuals with ID. 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 ID in PE 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.

### ***Instruments***

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). Satisfaction is also good predictor of retention (Astin, 1993). 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."

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."

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. 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.

### ***Data Analysis***

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. The t-test were 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.

### ***Results***

All participants 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. 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 before they participated in the study. With the exception of three individual, 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 50 participants ( $n = 31$  males, and  $n = 19$  females). Participants who met the criteria were randomly assigned to the e-learning group or the traditional group.

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.

### ***Descriptive statistics for the satisfaction survey of the e-learning group***

Ninety-one percent of participants in the e-learning group completed the survey. 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.

Figure 1.

Strongly disagree			Strongly agree			
1	2	3	4	5	6	7

Figure 1. Score system of PSSUQ.

In 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 1 presents the summary of the satisfaction scores of the e-learning group. (Table. 1)

Table 1. 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

The level of satisfaction on the videos measured the helpfulness in understanding the content, the quality of video. These questions were asked on each section.

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 ( $M = 6.5$ ,  $SD = 5.7$ ).

There were three videos in the section of 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 ( $M = 6.47$ ,  $SD = .49$ ).

One video was presented 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 ( $M = 6.47$ ,  $SD = .50$ ).

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 ( $M = 6.14$ ,  $SD = .44$ ).

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 ( $M = 6.14$ ,  $SD = .44$ ). (Table. 2)

Table 2. 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

### *Descriptive statistics for the satisfaction survey of the traditional group*

Sixty-five percent of participants in the traditional group 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 ( $M = 4.43$ ,  $SD = .91$ ). (Table. 3)

Table 3. 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	
Video: Environmental M.	Help to posttest			
	Help to understand	5.83	.56	7
	Quality of video	6.14	.44	
	Help to posttest	4	.92	

### *Note. Scale 1 to 7*

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. (Table.4)

Table 4. 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

### 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.
2. Traditional group: Overall, I am satisfied with how easy it is to use the information in the hand-out.
3. E-learning group: The content of the e-learning module was easy to understand.
4. Traditional group: The content of the hand-out was easy to understand
5. E-learning group: Information was effective to complete the tasks and scenarios using this e-learning module.
6. Traditional group: Information was effective in helping me complete the tasks and scenarios.
7. E-learning group: The organization of information was clear.
8. 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  $d = 3.004$ ).

### Discussions

In this study, the level of satisfaction on two different types of supplements, an e-learning supplement and a traditional supplement, were examined. 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.

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

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 colleagues (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. In blended learning environments, various factors are associated with student satisfaction such 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 investigate these associations, scale scores were created for 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 ( $p < 0.05$ ). These correlations ranged from .25 for student interaction to .50 for good e-resources, indicating moderate to strong levels of correlation. 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.

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