LEARNING SATISFACTION COMPARISON BETWEEN INFORMATION TECHNOLOGY(IT) SUPPORTED EDUCATION AND NORMAL FACE-TO-FACE LEARNING IN TECHNOLOGY CLASS

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Abstract

This paper is about experimental test case for difference of learning satisfaction between normal face-to-face teaching method and technology supported blended learning method in technology education class. The SNS and e-clip were used as an IT technology supported tools for learning, and 3 different experimental groups are defined such as a normal face-to-face learning group, blended learning group using SNS, and blended learning group using SNS &e-learning, including e-clip.

It identified the research frame of 3 satisfaction domains and 8 factors which should be needed to measure the blended learning satisfaction based on precedent research. Those are satisfaction of learning type, learning contents and interaction, and developed survey items which were apt for 8 factors. The 87 students were selected and participated for the experimentduring asemester(6 months) in junior high school. After the experiment, survey about satisfaction of 8 factors was performed by the students.

Through analytical result, the learning satisfaction level of the group using SNS & e-learningand the group using SNS were higher than that of the face-to-face group under the 0.01% pointsignificance level, and the learning satisfaction level of the group using SNS & e-learningwas higher than that of the group using SNS. But only two factors among 8 factors were tested meaningfully under 5% significance level by statistical t-test. Other results said that the blended learning method is more influenced to the all of satisfaction factors under the 0.01% point significance level by statistical ANOVA-test.

Consequently various blended learning method using technology supported tools should be developed for the teachers at the chalkface because this paper showed that the technology supported blended learning can produce learning satisfaction much more.

Keywords: e-learning, learning effect, learning satisfaction, IT supported learning, blended learning

1. Introduction

Contemporary educational and social environments are suit for utilizing computer,compared with past educational environments where the Internet and computer were not propagated. Computer-based infrastructures including projector, big-screen TV and Internet have been built,and various educational software have been widely used inthe classes.

However, there is a limitation that current educational environments are dominated by teachers. Current computer-based technology is rapidly evolving toward mobile computing both in hardware and software. SNS including twitter, facebook etc. offered numerous information and contents in society. The primary aim of this paper is to improve learning satisfaction with better educational experience by using smart media,which should result in improved academic achievement.

1.1 The Purpose of Research

A normal face-to-face learning is not enough to provide better educational experiences to students in school education. For this reason, education using e-learning isbeing taught actively and its effectiveness also has been verified through various studies. Furthermore, new instructional forms like mobile learning and u-learning are

emerged.In e-learning environments, smart education is essential, which is an education type using smart systems that have recently received much attention. The aim of this paper is to improve satisfaction in learningusing smart media, compared with the normal face-to-face learning.

1.2 Research Methodology

Research have been done for three groups: one for normal face-to-face learning, one for using smart media, and one for e-learning with smart media. We conducted survey about learning satisfaction, learning processsatisfaction, learning satisfactionusing SNS, and learning satisfactionusingSNS& e-learning for each group.And then, we analyzed the result of the survey by using t-test.

1.3 Research Scope

This research selected 3 classes for the experiment and conducted a survey for each class containing 30 students. Smart media and e-learning are used especially when deliver learning materials and discussion in classes.

2. Technology Education and E-Learning

2.1 Status of IT Education in Junior High School

In the current curriculum, there is no mandatory IT subject.Instead,there is a subject of technology and home economics including both technology and home economics. In this study, we focus on the technology-related units on the subject. Technology education in junior high school aims for having technological literacy and abilities through practical and problem-solving learning activities.

2.2 Practical Use and Education of Smart Media

In the IT industry, the term 'smart' is frequently used on mobile devices, for example,iphone, ipad, android-based mobile phones, and tablet PC. The term 'smart' has a derived meaning by appearance of smart devices as well as a literal meaning. The derived meaning of 'smart' is as follows.

Smart is the thingthatcan be automaticallyconnected, but originally seperated, andcan produce new values through a smart infrastructure(HyeonCheol K., 2011).

Computer technology and Internet changed the way people work, learn, and communicate. Recently, various mobile devices have been appeared with new advances in mobile communication technology like 3G and LTE. Also, much software and applications, such as twitter, facebook, kakao-talk, have been developed and optimized for mobile devices.

A smart media infrastructure that became popular recently broughtabout a material difference in an educational content model and a teaching-learning method. It enables us to realize a new educational value that was impossible or difficult before (HyeonCheol K., 2011).

Mostly, the use of smart media on classes is completely conducted by teachers. One reason for this is that technology lessons are given by individual teachers who devise its own class, which means that there is no class model implemented or developed for e-learning. In terms of the use of smart media, the most common forms of class are using multimedia or power point slides. These forms are partially incorporate e-learning into normal face-to-face learning, rather than smart media based learning.

In education, utilization of smart media means that learner has ability of control and convergencefor existing learning contents and the re-produced learning contents can be available to other learners for collaborative learning. Smart media that related to social media includes Wikipedia, blog, facebook, kakao-talk, and twitter.These social networking services can be used in education due to following characteristics and thosecharacteristicsmake the teaching-learning activities strong (Redecker C., 2009).

1. the availability and accessibility of social computing tools by teachers and learners
2. the functionalities of the tools employed, their suitability for the chosen task and the learners' familiarity with and acceptance of these tools
3. the students' attitudes towards the respective social computing tools and the extent to which they are able to appropriate them for their personal needs
4. the participants' background of knowledge and skills, the group structure, and the form of interaction and communication among peers

2.3 Blended Learning

Blended learning seemed to combine normal face-to-face learning and e-learning. Blended learning is defined as the combination of different training "media" (technologies, activities, and types of events) to create an optimum training program for a specific audience (Bersin, J., 2004). Other definitions of blended learning are includediverse web-based technologies to accomplish an educational goal, various pedagogical approaches to produce an optimal learning outcome, or any form of instructional technologyto create a harmonious effect of learning and working. (Margaret D., 2002; DukHoon K., 2010; MyungSook K., 2010).Therefore, SNS and social media also can be used for blended learning in school.

3. Learning Effect Analysis

3.1 Overview of the Survey

Students inHwi-Mun junior high school were chosen for survey. The school is a general junior high school that most of its students aim to go to an academic high school. The majority of teaching methodology is the traditional normal face-to-face learning focusing on theory. We look over how smart media based learning is impacting on learning satisfaction for students who are familiar with traditional face-to-face learning. For a verbal survey onutilization of smart media, kakao-talk turned out to be the most popular social media. Thus, we formed an experimental environment by dividing classes into three groups: 1) traditional offline learning, 2) learning using kakao-talk SNS, and 3) offline learning using kakao-talk SNS & e-learning

3.2 The Subject and Methodology of the Survey

Students in three groups take one course among three different teaching-style courses. 10 studentsin each classsurveyed. In other words, they represent Group 1, Group 2, and Group 3 respectively.

Group 1 – Offline, SNS, E-Learning
Group 2 – Offline, SNS
Group 3 – Offline

The questionnaire is composed of four categories, that is, learning satisfaction,learning processsatisfaction, learning satisfaction using SNS, and learning satisfaction using SNS & e-learning. Students answeredby checking on the questionnaire.

3.3 Results of the statistical analysis
3.3.1 Satisfaction of the Learning Contents

Let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_2)$ be the null hypothesis. From table 1-A, the null hypothesis is rejected in less than 1% of significance level so there is difference of average between two groups. This means thatlevel of group 1 is higher than that ofgroup 2 for the satisfaction of learning contents.

And let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 1-B,the null hypothesis H_0 cannot be rejected. This means that there is no difference for the satisfaction of learning contents between two groups.In addition, let $H_0 = \overline{X_1}(Group_2) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 1-C,the null hypothesis is rejected in less than 1% of significance level so there is difference of average between two groups. In other words, the satisfaction of learning contents level of group 2 is higher than that of group 3.

Table 1. T-TEST about Satisfaction of theLearning Contents

A		N	average	df	t-value	Pr > |t|
	Group 1	10	1.7			
	Group 2	10	2.2	18	-5.82	<.**0001***
	difference		-0.5			
B		N	average	df	t- value	Pr > |t|
	Group 1	10	1.7			
	Group 3	10	3.8	18	-1.39	0.1825
	difference		-2.1			

C		N	average	df	t- value	Pr > |t|
Group 2		10	2.2			
Group 3		10	3.8	18	-3.46	**0.0028***
difference			-1.6			

*: 99% of significance level, **: statistically significant at the 95% level

3.3.2 Satisfaction of theLearning Process

Let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_2)$ be the null hypothesis. From table 2-A, the null hypothesis is not rejected, this means that there is no difference of average and there is no difference of the satisfaction of learning process between two groups.And let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 2-B, the null hypothesis is rejected in less than 1% of significance level so there is difference of average between two groups. This means that the satisfaction of learning process level of group 1 is higher than that of group 3.

In addition, let $H_0 = \overline{X_1}(Group_2) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 2-C, the null hypothesis H_0 cannot even be rejected in less than 5% of significance level. This means that there is no difference forthe satisfaction of learning process between two groups.

Table 2.T-TEST about Satisfaction of the Learning Process

A		N	average	df	t-value	Pr > |t|
Group 1		10	1.9			
Group 2		10	2.6	18	-1.51	0.1480
difference			-0.7			
B		N	average	df	t- value	Pr > |t|
Group 1		10	1.9			
Group 3		10	3.7	18	-4.74	**0.0002***
difference			-1.8			
C		N	average	df	t- value	Pr > |t|
Group 2		10	2.6			
Group 3		10	3.7	18	-2.03	**0.0577****
difference			-1.1			

*: 99% of significance level, **: statistically significant at the 95% level

3.3.3Expectation of SNS for the Learning Effect

Let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_2)$ be the null hypothesis. From table 3-A, the null hypothesis is rejected in less than 1% of significance level so there is difference of average between two groups. This means that SNS learning satisfaction of group 1 is higher than that of group 2.And let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 3-B, the null hypothesis H_0 cannot be rejected. This means that there is no difference inexpectation of SNS for the learning effectbetween two groups.

In addition, let $H_0 = \overline{X_1}(Group_2) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 3-C, the null hypothesis is rejected in less than 5% of significance level so there is difference of average between two groups. In other words, expectation of SNS for learning effectof group 2 is higher than that of group 3.

Table 3. T-TEST about Expectation of SNS for the Learning Effect

A		N	average	df	t-value	Pr > |t|
	Group 1	10	1.6			
	Group 2	10	3.0	18	-2.94	**0.0087***
	difference		-1.4			
B		N	average	df	t- value	Pr > |t|
	Group 1	10	1.6			
	Group 3	10	1.8	18	-0.55	0.5906
	difference		-0.2			
C		N	average	df	t- value	Pr > |t|
	Group 2	10	3.0			
	Group 3	10	1.8	18	2.17	**0.0439****
	difference		1.2			

*: 99% of significance level, **: statistically significant at the 95% level

3.3.4 Expectation of SNS&e-Learning for the Learning Effect

Let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_2)$ be the null hypothesis. From table 4-A, the null hypothesis is rejected in less than 5% of significance level so there is difference of average between two groups. This means that expectation of SNS &e-learning for the learning effectof group 1 is higher than that of group 2.

And let $H_0 = \overline{X_1}(Group_1) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 4-B, the null hypothesis H_0 cannot be rejected. This means that there is no difference in expectation of SNS &e-learning for the learning effect between two groups.

In addition, let $H_0 = \overline{X_1}(Group_2) = \overline{X_1}(Group_3)$ be the null hypothesis. From table 4-C, the null hypothesis is rejected in less than 5% of significance level so there is difference of average between two groups. In other words, expectation of SNS &e-learning for learning effect of group 2 is higher than that of group 3.

Table 4. T-TEST about Expectation of SNS &e-Learning for the Learning Effect

A		N	average	df	t-value	Pr > |t|
	Group 1	10	1.7			
	Group 2	10	3.0	18	-2.41	0.0266
	difference		-0.5			
B		N	average	df	t- value	Pr > |t|
	Group 1	10	1.7			
	Group 3	10	1.7	18	0.00	1.0000
	difference		0.0			
C		N	average	df	t- value	Pr > |t|
	Group 2	10	3.0			
	Group 3	10	1.7	18	2.18	**0.0431****
	difference		1.3			

*: 99% of significance level, **: statistically significant at the 95% level

4. Conclusion and Future Works

Accordingtothe statistical results, satisfaction of learning contents of classes using SNS and e-learning was generally higher than other class which consists of traditional teaching class, but there was no difference of satisfaction between some groups. But this research implies that learning satisfaction and expectation of effect was higher in class using SNS and e-learning of IT supportive blended learning than otherwise class even if the experimentperiod wasabout two weeks of short time, and the research was conducted by small groups of 30 students in each group.Although the research results are not as satisfactory as we expected, IT supportive learning would be better for blended learning , specially using SNS and e-learning.

Consequently various blended learning method using technology supported tools should be developed for the teachers at the chalkface because this paper showed that the technology supported blended learning can produce learning satisfaction much more.

Biography

Tae In Han has a Ph.D. in computer science, and graduated from Korea Univ. in Seoul, Korea. He is a professor in e-Learning Dept. of Korea National Open Univ.and he is not only aexpert of ISO/IEC JTC1/SC36 but also a public and governmental consultant for e-learning policies, standards and technologies in Korea.

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