ปฏิสัมพันธ์ระหว่างกลวิธีการกำกับตนเองและระดับการรับรู้ความสามารถของตนเองในการเรียนโมบายเลิร์นนิ่งที่มีต่อผลสัมฤทธิ์ทางการเรียน เรื่องการสร้างสื่อการสอนมัลติมีเดียของนักศึกษาครู

Interaction of Self-Regulated and Self-Efficacy in Mobile Learning upon Learning Achievement in Multimedia Production of Pre-Service Teachers

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาปฏิสัมพันธ์ระหว่างกลวิธีการกำกับตนเองและระดับการรับรู้ความสามารถของตนเองในการเรียนโมบายเลิร์นนิ่ง ที่มีต่อผลสัมฤทธิ์ทางการเรียน เรื่องการสร้างสื่อการสอนมัลติมีเดียของนักศึกษาครู กลุ่มตัวอย่าง คือ นักศึกษาครู ที่ลงทะเบียนเรียนรายวิชา 1032502 การสร้างสื่อการเรียนการสอน จากมหาวิทยาลัยราชภัฏสุรินทร์ ชั้นปีที่ 3 จำนวนทั้งสิ้น 211 คน สถิติที่ใช้ในการวิเคราะห์ข้อมูลประกอบด้วย ค่าเฉลี่ยเลขคณิต ส่วนเบี่ยงเบนมาตรฐาน และสถิติทดสอบสมมติฐานการวิเคราะห์ ความแปรปรวนแบบสองทาง (Two Way ANOVA)

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ผลการวิจัย พบว่า

1. การศึกษาปฏิสัมพันธ์ร่วมกันระหว่างรูปแบบการกำกับตนเองและระดับการรับรู้ความสามารถของตนเองที่ส่งผลต่อทักษะการสร้างสื่อการสอนมัลติมีเดียของนักศึกษาครู พบว่า รูปแบบการกำกับตนเองและระดับการรับรู้ความสามารถของตนเองมีปฏิสัมพันธ์ร่วมกันต่อทักษะการสร้างสื่อการสอนมัลติมีเดีย อย่างมีนัยสำคัญที่ระดับ .05

2. กลุ่มผู้เรียนที่มีระดับการรับรู้ความสามารถของตนเองสูงที่มีรูปแบบการกำกับตนเองด้านสิ่งแวดล้อม มีคะแนนเฉลี่ยของระดับประสิทธิภาพในการสร้างสื่อการสอนมัลติมีเดียทั้ง 7 ด้าน มีคะแนนเฉลี่ยเท่ากับ 23.06 (ร้อยละ 79.51) ซึ่งสูงกว่าผู้เรียนที่มีรูปแบบการกำกับตนเองด้านภายในบุคคลมีคะแนนเฉลี่ยเท่ากับ 22.27 (ร้อยละ 76.79) และด้านพฤติกรรมมีคะแนนเฉลี่ยเท่ากับ 21.21 (ร้อยละ 73.13)

3. กลุ่มผู้เรียนที่มีรูปแบบการกำกับตนเองด้านพฤติกรรมที่มีการรับรู้ความสามารถของตนเองระดับปานกลาง มีคะแนนเฉลี่ยของประสิทธิภาพในการสร้างสื่อการสอนมัลติมีเดียทั้ง 7 ด้าน มีคะแนนเฉลี่ยเท่ากับ 21.72 (ร้อยละ 74.89) ซึ่งสูงกว่าผู้เรียนที่มีระดับการรับรู้ความสามารถของตนเองสูงมีคะแนนเฉลี่ยเท่ากับ 21.21 (ร้อยละ 73.13) และกลุ่มผู้เรียน ที่มีรูปแบบการกำกับตนเองด้านพฤติกรรมที่มีการรับรู้ความสามารถของตนเองต่ำมีคะแนนเฉลี่ยเท่ากับ 20.20 (ร้อยละ 69.65)

Abstract

The objectives of this research were to study interaction of self-regulated and self-efficacy in mobile learning upon learning achievement in multimedia production of pre-service teachers. The samples were 211 pre-service teachers who have been studying a designing educational media course in Faculty of Education, Surindra Rajabhat University. The statistical methods for analyzing data consisted of Arithmetic mean, Standard Deviation, Percentage average, and Two-Way ANOVA for statistical hypothesis testing.

The results of this research were as follows :

1. There was an interaction between self-regulated learning style and self-efficacy level that affected the achievement in multimedia production of pre-service teachers significantly at the .05 level.

2. The variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had high level of self-efficacy and environmental self-regulated learning style were $\overline{X}$ = 23.06 (79.51%) which was higher than pre-service teachers who had covert $\overline{X}$ = 22.27 (76.79%) and behavioral $\overline{X}$ = 21.21 (73.13%) self-regulated learning styles.

3. The variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had behavioral self-regulated learning style and medium level of self-efficacy were $\overline{X}$ = 21.72 (74.89%) which was higher than pre-service teachers who had high level $\overline{X}$ = 21.21 (73.13%) and low level $\overline{X}$ = 20.20 (69.65%) of self-efficacy.

Keywords : self-regulated, self-efficacy, multimedia production

Introduction

Nowadays, Information and Technology has an important role in education. Research by Meenakshi found that ICTs can enhance the quality of education in several ways: firstly by increasing learner motivation and engagement, secondly by facilitating the acquisition of basic skills, and thirdly by enhancing teacher training. ICTs are also transformational tools which when used appropriately, can promote the shift to a learner-centered

environment. (Meenakshi. 2013 : PP 03 - 08). Therefore, instructional media has a key role for people development both currently and in the future, especially online computer lessons such as e-Learning, e-Training or m-Learning. The researcher as a teacher of Information and Communication Technology for Education program, Faculty of Education, Surindra Rajabhat University, Thailand, responsible for teaching the multimedia production course for pre-service teachers, found that education was related to the development of multimedia production skills necessary for pre-service teachers. Multimedia had been designed and created by a combination of text, still image, video, animation and sound together to be interesting and easy for communication and interpretation. In teaching, multimedia will be expanding teaching content for students to be understood clearly. Therefore, the researcher had the idea to develop instruction media production skills, especially multimedia production by study interaction of self-efficacy and self-regulated in mobile learning for learning achievement in multimedia production of pre-service teachers. The researcher's belief was that this study will reinforce and develop multimedia production skills of pre-service Technology, social media and social networks which students are able to learn by themselves.

Self-efficacy

Self-efficacy relates to level of self-judgment for taking actions, the ability to do things which influences livelihood. Belief in self-efficacy considers feelings, ideas, motivations and behaviors that are used to judge a person's capability to manage actions effectively, and achieve the goal. Efficacy beliefs also help determine how much effort people will expend

on an activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of adverse situations (Schunk, 1981; Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987). Albert Bandura's (1962 - 1986) analysis of social learning theory found that self-efficacy is the most influential individual factor on self-regulation learning. Pintrich and De Groot's research found that there is a correlation between self-efficacy and self-regulation learning (Pintrich and De Groot, 1990 : 33 - 40).

Self-Regulation

Self-Regulation relates to the use of processes such as thinking, taking action, behaving and engaging in purposeful activities (Zimmerman. 1989) and is an important concept of Social Cognitive Theory. Bandura (1986) believes that human behaviors do not occur or change by only environment factors, but also include personal and behavioral factors. According to a different definition, self-regulation is a process whereby students actively manage their cognition, motivation and behavior after passing through certain self-regulatory processes (Hofer, Yu and Pintrich. 1998). In addition, self-regulation is the important skill in both the learning process at school and individual learning after school. Normally, self-regulated learner characteristics will be active, manage things by using constructivism and metacognition methods, and achieve the goals efficiently. (Boekaerts, 1997 : 161) Fundamental analysis of self-regulated learning according to Pintrich and De Groot's guideline had been divided into two parts 1. Cognitive strategy and 2. Self-Regulation, with each part including the format of strategies that students use in different situations (Pintrich and De Groot. 1990 : 33 - 40). Research by Zimmerman and Martinez found that there

is a high correlation between self-regulation and learning achievement (Zimmerman and Martinez - Pons, 1988 : 284 - 290).

Multimedia production

For education in Thailand, teachers used multimedia to expand lecture content for students to be understood clearly. Multimedia can make students interested in learning content, increase motivation and ease communication and interpretation in learning. Multimedia can be like a powerful tool for teaching and learning. Multimedia can be viewed as a learning tool and a means of communication. Within learning situations, multimedia products and online services can be used creatively and reflectively (Bent B. Andresen and Katja van den Brink. 2013). Furthermore, multimedia can be used to foster learning subject matter and cross-curricular topics. General goals of education frame the use of multimedia in education. The following goals of education can be considered as important. Multimedia production begins with gathering content elements that fulfil the purpose of higher layer components, followed by integration of these elements to create a meaningful presentation (Furht,B.2008). Multimedia also refers to the use of electronic media to store and experience multimedia content. The basic elements of multimedia simply combines these elements into a powerful new tool, especially in the hands of teachers and students. Interactive multimedia weaves five basic types of media into the learning environment : text, video, sound, graphics and animation (Furht, 2008). There are many reasons to use multimedia in education, one of those reasons is multimedia has advantages for both students and teachers. The power of multimedia can be used to enhance effective learning

outcomes in the learning process. It has advantages such as a large amount of information, fast speed, wide scope and two-way interaction. The application of multimedia materials provides an ideal teaching approach for the teaching process, and realizes the share of excellent education resources and methods without time or space constraints (Teng, Yu, 2014).

The purpose of this research

The purpose of this research is to study an interaction of self-regulated and self-efficacy in mobile learning upon learning achievement in multimedia production of pre-service teachers.

Research hypothesis

1. There is an interaction between self-regulated learning style and self-efficacy level that affect the achievement in multimedia production of pre-service teacher significantly at the .05 level.

2. The variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had high level of self-efficacy and covert self-regulated learning style are higher than environmental and behavioral self-regulated learning style.

3. The variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had behavioral self-regulated learning style and high level of self-efficacy are higher than medium and low level of self-efficacy.

Population and Samples

The population was 1,300 pre-service teachers from Surindra Rajabhat University.

The Samples were from pre-service teachers who have been studying in multimedia production course (1032502), in 3 sections and 450 people in Faculty of Education, Surindra Rajabhat University. The samples used Systematic Random Sampling by reading the names of the pre-service teachers and skipped one by one from 450 names until finally, there were 211 samples. Then selected students followed measurement of self-regulated learning patterns in 3 aspects and measurement of self-efficacy in mobile learning patterns. Defined conditions and grouping of the samples were as follows;

1. Students were divided into 3 groups at high level, medium level and low level self-efficacy. Each group had 15 people for the Behavioral Self-Regulation learning style on mobile-learning and there were not less than 45 people in total.

2. Students were divided into 3 groups at high level, medium level and low level self-efficacy. Each group had 15 people for the Environmental Self-Regulation learning style on mobile-learning and there were not less than 45 people in total.

3. Students were divided into 3 groups at high level self-efficacy, medium level and low level. Each group has 15 people for Covert Self-Regulation learning style on mobile-learning and there were not less than 45 people in total.

Basic Agreement for research

The researcher defined the basic requirement for qualification samples as follows;

1. The samples must have Basic Computer Skills (BCS), Media-Related Skills (MRS) and Web - Based Skills (WBS) which were learned in a Basic Computer course or passed the Computer ability test. The researcher developed the measurement form following the concept by Merphy (Merphy. 1989) The Murphy Computer Self-efficacy Scale and Timothy Teo and Joyce Hwee (Timothy and Joyce, 2010)

2. The samples must have mobile technology tools for use in learning and teaching activity such as smartphone, tablet and laptop.

Research instruments

Research instruments of this research were as follows :

1. 30 online questionnaires were used to evaluate of learning achievement in multimedia production as pre-test and post-test. The researcher created them from Bloom's theory and multimedia Production course of Surindra Rajabhat University of Thailand by synthesis scope of Cognitive Domain (Bloom, et.al., 1956) and 7 aspects of multimedia production and then created 30 online questionnaires and tried them out with 30 samples. Results of Item analysis by KR20 (Alpha) reliability analysis were 0.749 and results of Index of Item-Objective Congruence (IOC) by 5 experts on 30 online questionnaires were 0.91

2. Multimedia production assessment form were used to assessment on 7 aspects of multimedia production such as Designing, Text, Still image

and graphic, Video, Animation, Sound and Colors. The Researcher created this by synthesizing the scope of Multimedia production from ministry of information and communication technology Thailand and set Evaluation criteria such as Designing, Text, Still image and graphic, Video, Animation, Sound and Colors. Results of Index of Item-Objective Congruence (IOC) by 7 experts on the Multimedia production assessment form were 0.91

Research methodology

The research methodology of this research had the following steps :

Step 1 Data collection

1. Pre-test Knowledge of Multimedia production by 30 online questionnaires.

2. Students orientation, Explain how to study the following activities, duration, objectives and measurement of assessment.

3. Follow 6 weeks of the lesson plan.

4. Self-regulation activities.

Table 1 Self-regulation Activities

Self-regulation	Self-regulation Activities
Behavioral Self-regulation	- Self - Evaluation - Keeping Records and Monitoring - Self - Consequences
Environmental Self-regulation	- Environmental Structuring - Seeking Social Assistance - Reviewing Records
Covert Self-regulation	- Goal Setting and Planning - Rehearsing and Memorizing

From the TABLE 1, In Each lesson students will have to do Self-regulation activities as Self-Monitoring by taking notes after finishing the class.

Step 2 Measurement and Evaluation

The operating procedures after the sample groups had finished the studies and activities were as follows :

1. Activities check: there were 211 from 255 sample groups who had completed all stages of activities.

2. Learning achievement evaluation (post-test) by the same 30 online questionnaires.

3. Multimedia production evaluation by Assessment form on 7 aspects of multimedia production

Step 3 Summary

Summarize the results of research by statistical methods for analyzing data consisting of Arithmetic mean, Standard Deviation, Percentage average, and Two-Way ANOVA for statistical hypothesis testing.

Research Results

The results of interaction of self-regulated and self-efficacy in mobile learning upon learning achievement in multimedia production of pre-service teacher are shown below.

1. Result scores of learning achievement in 7 aspects of multimedia production

Table 2 Result scores of learning achievement in 7 aspects of multimedia production

Self-efficacy	Self-regulated									Total		
	Behavioral			Covert			Environmental					
	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.	N	$\bar{X}$	S.D.
High	22	21.21 (73.13%)	0.68	24	22.27 (76.79%)	0.58	30	23.06 (79.51%)	0.60	76	22.28 (81.31%)	0.97
Medium	21	21.72 (74.89%)	0.68	21	23.31 (80.37%)	0.74	26	22.19 (76.51%)	0.86	68	22.39 (77.20%)	1.00
Low	28	20.20 (69.65%)	0.72	19	22.21 (76.58%)	0.53	20	21.72 (74.89%)	0.97	67	21.23 (73.20%)	1.17
Total	71	20.96 (72.27%)	0.95	64	22.60 (77.93%)	0.80	76	22.41 (77.26%)	0.97	211	21.98 (75.79%)	1.16

From the Table 2, it can be seen that in the case of self-efficacy the variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had high level of self-efficacy and environmental self-regulated learning style were $\bar{X}$ = 23.06 (79.51%) which is higher than pre-service teachers who had covert $\bar{X}$ = 22.27 (76.79%) and behavioral $\bar{X}$ = 21.21 (73.13%) self-regulated learning

styles. For the case of self-efficacy the variance testing result scores of learning achievement in 7 aspects of multimedia production of pre-service teacher who had behavioral self-regulated learning style and medium level of self-efficacy were = 21.72 (74.89%) which is higher than pre-service teachers who had high level $\bar{X}$ = 21.21 (73.13%) and low level $\bar{X}$ = 20.20 (69.65%) of self-efficacy.

2. Interaction of self-regulated and self-efficacy in mobile learning upon learning achievement in multimedia production of pre-service teachers

Table 3 Interaction between Self-efficacy and Self-regulated

Source	Type III Sum of Squares	df	Mean Square (MS)	F	Sig.
Self-regulated	94.371	2	47.185	90.359	.000*
Self-efficacy	38.773	2	19.387	37.125	.000*
Self-regulated *Self-efficacy	28.547	4	7.137	13.667	.000*
error	105.484	202	.522		
Total	102265.980	211			

*p 0.05

From the Table 3, it can be seen that there was interaction between self-regulated learning style and self-efficacy level that affected the achievement in multimedia production of pre-service teacher significantly at the .05 level.

Conclusion and Discussion

This research focused on interaction of self-regulated and self-efficacy in mobile learning upon learning achievement in multimedia production of pre-service teachers. The results showed pre-service teachers who had a high level of self-efficacy and environmental self-regulated learning style made good effort and had good performances in problem solving especially environment management to support their own needs which affected learning achievement at the highest level in 7 aspects of multimedia production. Pre-service teachers who had a behavioral self-regulated learning style and a medium level of self-efficacy had good effective behavioral control of themselves by the Self-evaluation method to check their actions which affected learning achievement at the highest level in 7 aspects of multimedia production. In addition, the research showed that there was interaction between self-regulated learning style and self-efficacy level that affected the achievement in multimedia production of pre-service teachers significantly at the .05 level. As mentioned above, this could be an explanation about why the influence of the self-direction and self-efficacy were directly affecting the learning process and that achievement will be at a higher level if practiced continuously.

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