The Blended-Learning Management Model in Developing Information Literacy Skills for Students at the Institute of Physical Education

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Abstract: Introduction: The objectives of this research were to develop an efficient blended-learning management model in developing information literacy skills for students at the Institute of Physical Education, and to study the outcome of the development information literacy skills in students taught by the blended-learning management model at the Institute of Physical Education. **Methods:** The current study was an experiment of One Group Pretest Posttest Design. The samples were 30 first-year physical education students at the Institute of Physical Education, Phetchabun Campus who were enrolled in the course ST 071001: Information Technology for Learning, during second semester of 2012. **Results:** The study found that the efficiency of BL-ILS model was at the "Very Good" level ($\bar{X}$ = 4.65). The students' competency in literacy skills after learning with the BL-ILS model were higher and here was a significant different of pretest and posttest average scores ($P \leqslant 0.05$). **Conclusion:** The BL-ILS model was appropriate for learning management in other higher education courses. It also could be used as the core of learning management in different sciences because it enhances self-directed learning and allows students to learn independently and efficiently.

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1. Introduction

Today's knowledge-based society is brimming with information. Consequently, people must know a significant amount of information and learn continuously to keep pace up with new developments. Individuals need to learn to perceive information and news appropriately and correctly. A person who possesses information literacy can live in the information society and the 21st century (Chutima Sacchanand, 2008).

The study of Information Technology and Communication Project 2007 of the Nation Statistical Office, Ministry of Information Technology found that Thai society used more information technology and the Internet but had was unable to use the information efficiently (Nation Statistical Office, 2007). In addition, Thai society could not access the knowledge-based society as people lacked information to access skills and utilize information efficiently. They lacked the ability to modify information skills to become knowledgeable and also lacked thinking and reasoning skills to construct the body of knowledge independently (Kriengsak Chareonwongsak, 2008). Information literacy was everyone's major learning objective to help access information from every corner of the world, and use the information efficiently to promote freedom in learning. So, development of information literacy process skills for students to use as the core of learning in different sciences would powered the knowledge-based society and be the main factor to change both Thai and the world society (Chutima Sacchanand, 2008). The purpose of this study was to develop an efficient blended-learning management model in developing the information literacy skills for students at the Institute of Physical Education to be used as guidelines for further developing quality learning management. The specific objectives of this study were:

- To develop an efficient blended-learning management model in developing information literacy skills for students at the Institute of Physical Education.
- To investigate the outcome of development of information literacy skills in students taught by the blended-learning management model at the Institute of Physical Education.

2. Material and Methods

2.1. Study protocol:

This was a research and development type of study that consisted of two phases: 1. Development of the Blended-Learning Management; and 2. Study of the Outcome from Usage of Blended-Learning Management model.

2.1.1. Development of the Blended-Learning Management Model

In the development stage, we studied basic information and problems in instructional management of undergraduate students as well as

related literature (Nuanphan Chaiyama, 2011). We adjusted current approaches with enhancement information literacy from The Big 6 Skills model (Mike Eisenberg & Bob Berkowitz, 2009) and other research (Archanya Ratana-ubol, et. al., 2008). The model was investigated by five experts, and their recommendation was considered. The blended-learning management plan to develop information literacy skills and online lesson in course ST 071001: Information Technology for Learning on Learning Management System (LMS) was constructed, as well as the instrument for data collection. The model was adapted developed to be more efficient in the pilot experiment. The instrument was used for collecting data to be experimented from students enrolled in the course ST 071001: Information Technology for Learning. Thirty first-year students in the second semester of 2012 academic year were separated from the sampling group to study suitability and possibility for used learning management. The researcher collected data, and the findings from the pilot experiment were analyzed by using the mean and standard deviation. Content analysis was administered to reach conclusions and improve the learning management model. The instrument for learning management was complete before using.

2.1.2. Study of the Outcome from Usage of Blended-Learning Management Model

In this step, we performed a One Group Pretest-Posttest Design as an experimental study. The samples were 30 first-year physical education students enrolled in the course ST 071001: Information Technology for Learning, during the second semester of 2012. They were selected by cluster sampling based on step-by-step implementation as follows:

1) **Preparation:** The researcher organized orientation, grouped the students, assigned the students who enrolled, and trained them in the technique of using the information technology system. The students responded to the Information Literacy Skills Test before studying. The instructor investigated the Information Literacy Skills Test and told students to gauge their own skills level as the guidelines for determining the goal of further study.

2) **Teaching According to the Learning Model:** The researcher implemented teaching based on the blended-learning activity model and planned to develop the specified information literacy skills.

3) **Data Collection during Learning Management:** The researcher collected data from the outcomes of learning management by different prepared instruments. Data were analyzed, including the incidences during learning management, discussions, and sharing among group members as well as learning achievement (work pieces) stored in the Learning Management System (LMS).

4) **Measurement of Posttest Information Literacy Skills:** After implementing the experiment with each learning activity management plan, the researcher tested the students' information literacy skills by using the Information Literacy Skills Test, and investigated and provided feedback to the students.

Data were reported as the means and standard deviations. Data were analyzed by comparing with the criterion, and interpreted based on specified meaning to conclude students' level of information literacy for each skill. The content analysis was conducted from data by interviewing students and seeking their opinions on learning development developed by the researcher. The scores from responses to the Information Literacy Skills Test pretest and posttest were compared using the t-test dependent.

2.2. Research Instruments

The followings were used as the measurement tools and other instruments in the research:

- **The Instrument Used in the Experiment,** included the blended=learning management plan for developing information literacy skills, and website of online lesson in the course ST 071001: Information Technology for Learning, developed by the researcher was stored in Learning Management System (LMS).
- **The Instrument Used for Data Collection,** was the Information Literacy Skills Test developed by the researcher by adapting the Information Literacy Skills Test of Kochaporn Sriphan (2010) based on the approach of Association of College and Research Libraries (ACRL, 2000) for five standards as multiple choice question, 50 items, the Cronbach's alpha score of 0.89.
- **The Learning Evaluation Inventory (Work Piece),** used to evaluate students' learning performance was established in each step of learning management for evaluating students' competency in each information literacy skill.
- **The Students' Structured Interview**, used for asking students' opinion on the learning activity. The issues were classified into issues relating to students, instructors, instructional media, and appropriateness of learning activity, activity characteristic, and duration of learning activity management, and conclusions and evaluation of learning.

3. Results

3.1. The Blended-Learning Management Model

The blended-learning management model in developing information literacy skills for the students at the Institute of Physical Education (Figure 1), developed by the researcher, consisted of four components (Table1):

- The principle of learning model
- The objective of learning model
- The learning management process
- The measurement and evaluation of the learning model

There were two phases of learning management process:

1) The phase of preparation

2) The phase of learning management strategies to develop information literacy skills including:

a) Determination of task for study.
b) Determination of strategies for searching information.
c) Search and collection of information.
d) The analysis, synthesis, and organization of information
e) The evaluation and presentation of information

The efficiency of the learning management model, developed by the researcher reached a "Very Good" level ($\bar{X}$= 4.65, S.D. = 0.48), and the results of the pilot experiment the BL-ILS model found that could be learning management continually (Table2).

Table 1. Components of the blended learning management model in developing information literacy skills

Principle of Learning Model	Objective of Learning Model	Learning Management Process	Measurement and Evaluation
Blended Learning Management	Determines the nature and extent of the information needed	Phase 1: Preparation	The Authentic Measurement and Evaluation
Strategy to Develop Information Literacy Skills	Accesses needed information effectively and efficiently	Phase 2: Learning Management Strategies to Develop Information Literacy Skills	Measurement of Information Literacy Skills after Studying
Media/Supportive Resource of Learning	Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system		
Students' role	Individually or as a member of a group, uses information effectively to accomplish a specific purpose		
Instructors' role	Understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally		

3.2 The Outcome of Development Information Literacy Skills of Students Taught by the BL-ILS Model

The experiment studied the blended-learning management model in developing information literacy skills for students at the Institute of Physical Education, with the samples of 30 first-year physical education students who enrolled the course ST 071001: Information Technology for Learning, during the second semester of 2012 academic year. The research findings revealed that the samples taught by the blended-learning management model in developing information literacy skills had posttest scores of information literacy skills at a higher level than the pretest score at 0.05 level of significance (Table 3). In addition, they had average scores from each competency skill in information literacy at the "Good" level (Table 4). Analysis of the qualitative data found that the students were happy while participating in the learning activities. They had more opportunity to train for systematic thinking. They obtained learning, and were able to construct a body of knowledge by themselves through participation in learning activities. They had the opportunity to share and compare their opinions with their friends and classmates. They discussed with their friends the different issues of knowledge. As a result, they developed their group working skill, and had more self-confidence in presentation or discussion of performance. They can meet recommended

guidelines for applying knowledge in other situations, and practice their skills using the information technology and online learning through Internet network system.

Figure 1. The blended learning management model in developing information literacy skills (BL-ILS model)

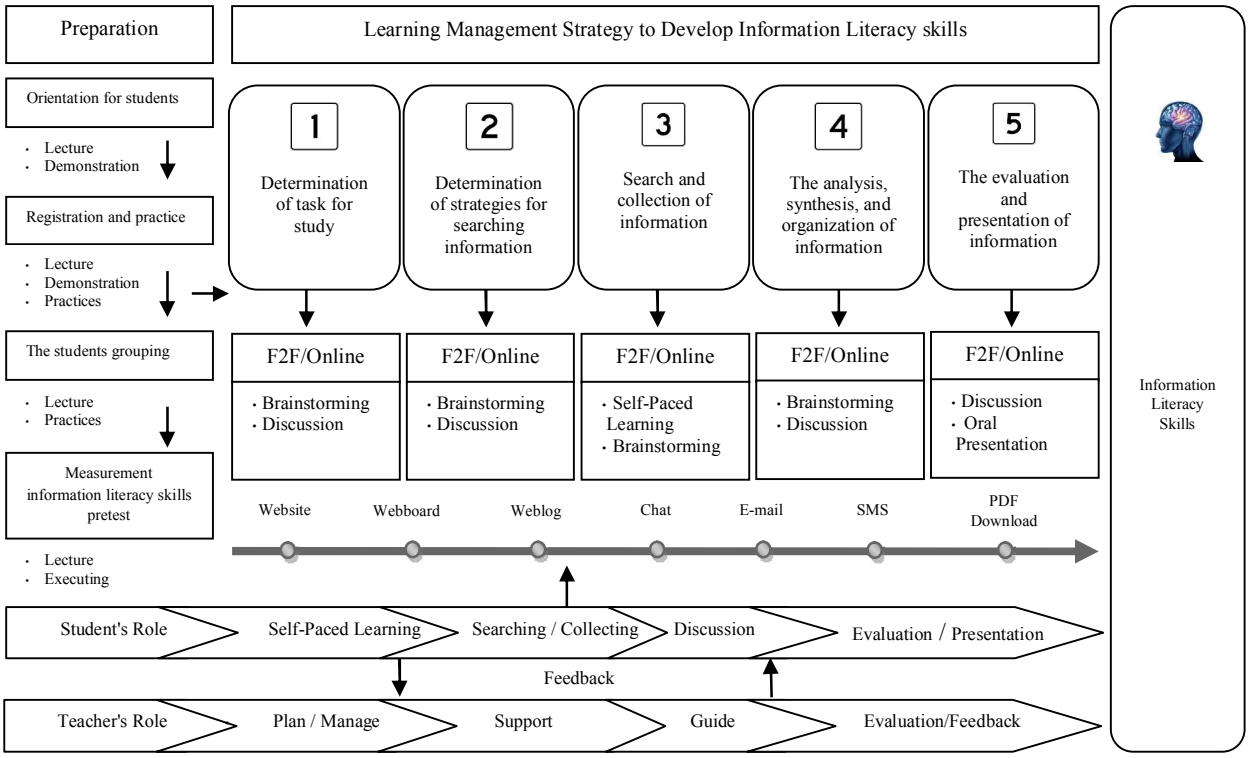

Table 2. The efficiency of the BL-ILS model was investigated by the experts

Detail of Evaluation	Result of efficiency		
	$\bar{X}$	S.D.	Efficiency level
The principles and concept to develop the blended Learning management model in developing information literacy skills	4.60	0.54	Very Good
The objective of learning management model	4.60	0.54	Very Good
Media/Supportive Resource of Learning	4.60	0.54	Very Good
Learning Management Process	4.60	0.54	Very Good
Learning management strategies to develop information literacy skills	4.80	0.44	Very Good
1) Determination of task for study.	4.60	0.54	Very Good
2) Determination of strategies for searching information.	4.80	0.44	Very Good
3) Search and collection of information	4.60	0.54	Very Good
4) The analysis, synthesis, and organization of information	4.60	0.54	Very Good
5) The evaluation and presentation of information	4.80	0.44	Very Good
Measurement and Evaluation of Learning	4.60	0.54	Very Good
The possibility for leads the blended learning management model in developing information literacy skills to use in learning management	4.60	0.54	Very Good
Average score	**4.65**	**0.48**	**Very Good**

Table 3. The students' average score of information literacy skills taught by BL-ILS model

Information Literacy Skills	N=30					
	Full Score	Pretest		Posttest		t
		$\bar{x}_1$	S.D.$_1$	$\bar{x}_2$	S.D.$_2$	
The information literate student determines the nature and extent of the information needed.	9	4.40	1.07	5.80	0.89	5.17
The information literate student accesses needed information effectively and efficiently.	11	5.80	1.03	7.57	0.90	5.27
The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.	12	6.47	0.94	8.57	1.19	5.06
The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.	10	5.93	0.69	7.40	0.89	4.98
The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.	8	4.37	0.89	5.70	0.79	5.16
Average score	**50**	**26.97**	**1.25**	**35.10**	**1.44**	**5.39**

** $(p \leq 0.05)$

Table 4: The students' competency in each information literacy skill taught by BL-ILS model

Information Literacy Skills	Result of Competency		
	$\bar{X}$	S.D.	Competency level
The information literate student determines the nature and extent of the information needed.	3.26	0.45	Good
The information literate student accesses needed information effectively and efficiently.	3.74	0.45	Good
The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.	3.26	0.45	Good
The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.	3.16	0.37	Good
The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.	3.11	0.32	Good
Average score	**3.30**	**0.60**	**Good**

4. Discussions

The students taught by the blended-learning management model to develop the information literacy skills at the Institute of Physical Education, obtained higher level posttest scores of information than the pretest score at 0.05 level of significance. Furthermore, they had an average score of "Good" in each of information literacy skill, as the specified hypothesis. The researcher applied the approach of blended-learning management to develop higher-order thinking skills of Nuanphan Chaiyama (2011) with the approach of information literacy enhancement from The Big 6 Skills model developed by Mike Eisenberg &Bob Berkowitz (2009), and Process of Information Literacy Enhancement for Thai Society developed by Achanya Rattana-ubon, et al. (2007). This was to be synthesized into a process of learning management as well as strategies for developing the information literacy skills in students at the Institute of Physical Education. There was continuity in each step of learning from the two phases: Phase 1: the preparation (face-to-face activity was focused on), Phase 2: learning management strategies to develop information literacy skills. (face-to- face/online activity was organized) emphasizing that students practice learning through group process and the instructors played their role as facilitators in guiding the learning, including these

five steps: 1) determination of task for study, 2) determination of strategies for searching information, 3) Search and collection of information, 4) the analysis, synthesis, and organization of information, and 5) the evaluation and presentation of information. This learning management process would enable students to develop their information literacy skills through a systematic thinking process as well as develop competency in creating new work performances and a body of knowledge by themselves, as well as apply the steps and learning technique as a core of learning to various aspects of different sciences efficiently. It was supported by Bonk & Graham's (2006) statement that the blended-learning management model would enhance students' learning and enable them to construct a body of knowledge by themselves, which is useful for enhancing learning efficiency.

The students taught by the blended-learning management model in developing the information literacy skills for students at the Institute of Physical Education were satisfied with learning and happy while they participated in learning activities. They had the opportunity to share their opinions as well as compare their opinions with friends and classmates regarding different issues of knowledge. As a result, they were able to develop their group working skills and better relationship with classmates. They were confident in discussions and presentations and developed guidelines for applying their knowledge in other situations. Moreover, they could practice the information technology online learning through the Internet. They wanted to experience this kind of learning in other courses as well. It was supported by the studies of Nuanphan Chaiyama (2011), Narumon Rodniam (2011), and Panita Wannapiroon (2007) that found that blended-learning management could develop students' satisfaction in learning development. Furthermore, research by Mossavar-Rahmani & Larson-Daughterty (2007) found that the blended-learning management gave students the opportunity to contact and interact with instructors both inside the classroom and in online classes, 3) the students were able to communicate with their classmates inside the classroom and online, and 4) the students were able to participate in group work by using technology facilitated by the virtual classroom.

5. Conclusion

In summary, this research supported the outcome of development and application of a learning management model by writing the learning management plans for developing information literacy skills in information technology for teaching physical education students. It is also appropriate to be applied in learning management in other courses. Our findings emphasized that the instructors would implement it to analyze the learning content as well as prepare learning media. Studying the relationship between development of information literacy skills and learning achievement and competency in information communication and technology could be a good direction for future research.

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