Development of Distance Training Packages on Information Communications and Technology used in Distance Education

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Abstract

The purposes of this research were four-fold: (1) to study the opinions of students toward the topic of distance training packages on information communications and technology; (2) to develop the distance training packages on information communications and technology; (3) to study the learning progress of students using distance training packages; and (4) to study the opinions of students toward the distance training packages. The sample for this research comprised 2 groups: (1) sample to study the opinions of students toward the topic of distance training packages were 300 bachelor students of the Department of Educational Technology and Communications. They were selected through the simple sampling technique; (2) sample to develop the distance training packages were 62 bachelor students of the Department of Educational Technology and Communications. They were selected through the Stratified sampling technique. Research instruments comprised (1) a questionnaires to study the opinions of students toward the topic of distance training packages (2) distance training packages on information communications and technology (3) an achievement test for pre-testing and post-testing; and (4) a questionnaire on bachelor students' opinions toward the distance training packages. Statistics employed for data analysis were mean, standard deviation, and t-test.

Research findings showed that

1) The bachelor students' opinions revealed that the overall on the topic of distance training packages was at the high level.

2) The four units of distance training packages had efficiency indices of 81. 50/80. 00, 80. 25/80. 40, 20 .10/81 .81 and 80. 65/80. 80 respectively, thus meeting the determined 80/80 efficiency criterion.

3) The bachelor students' learning achievement increased significantly at the . 05 level indicating significant training progress

4) The bachelor students' opinions toward the quality of the distance training packages were at the "High Agreeable" level.

Keywords : Distance Training Packages, Information Communications and Technology

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Introduction

With an enormous progress rising in almost all parts of our lives, students and people in general have used Information Communications and Technology (ICT). Worldwide, entertainment, learning and others are available on line. Those who are interested to learn can do so at their disposal. As technological advances have been pervasive, hence it is essential for the students to made an appropriate adjustment.

Nowadays there has been a constant search for knowledge available on line, which is one kind of distance learning. Now it has turned out that due to the availability of technology, learning and training do not necessarily take place where the learners are. A learning process and the learners may be far apart. Anyone can learn from anywhere one finds it convenient or possible to do so. Distance learning is relatively cheap. The learners do not need to spend on travelling and so on. Technology and communications which are easily available can greatly allow the students to learn and search for knowledge.

However, there are problems. Those able to make use of the technology and communication channels are the ones who have skills and training in using technology. There are no contents which teach technology for the undergraduate students. As information communications and technology are new and they are not contained in the curriculum at an undergraduate level, attention is mainly given to the content of educational technology and teaching media. Furthermore, a majority of the learners do not have working knowledge in using information technology. It is unfortunate to find that the human resources in Thailand are deprived of a good opportunity to seek valuable knowledge as they are not skilled in this technology. Therefore it is very important to transfer knowledge on information communications and technology to the public in general.

Thus, it is essential to conduct a research on developing a distance training package on information technology and information for the purposes of a self-development, a training and informal education. It is also expected the package can lead to more efficient use of technology by the students in particular and people in general.

Literature Reviews

1. Theory of Distance Learning

The development of new technologies has promoted an astounding growth in Distance Learning, both in the number of students enrolling and in the number of universities adding education at a distance to their curriculum (Garrison, 1990). While the application of modem technology may glamorize Distance Learning, literature in the field reveals a conceptually fragmented framework lacking in both theoretical foundation and programmatic

research. Without a strong base in research and theory, Distance Learning has struggled for recognition by the traditional academic community. Distance Learning has been described by some (Garrison, 1990; Hayes, 1990) as no more than a hodgepodge of ideas and practices taken from traditional classroom settings and imposed on learners who just happen to be separated physically from an instructor. As Distance Learning struggles to identify appropriate theoretical frameworks, implementation issues also become important. These issues involve the learner, the instructor, and the technology. Because of the very nature of Distance Learning as learner-centered instruction, distance educators must move ahead to investigate how the learner, the instructor, and the technology collaborate to generate knowledge.

Traditionally, both theoretical constructs and research studies in Distance Learning have been considered in the context of an educational enterprise that was entirely separate from the standard, classroom-based, classical instructional model. In part to justify, and in part to explain, the phenomenon, theoreticians like Holmberg, Keegan, and Rumble explored the underlying assumptions of what it is that makes Distance Learning different from traditional education. With an early vision of what it meant to be a nontraditional learner, these pioneers in Distance Learning defined the distance learner as one who is physically separated from the teacher (Rumble, 1986), has a planned and guided learning experience (Holmberg, 1986), and participates in a two-way structured form of Distance Learning that is distinct from the traditional form of classroom instruction (Keegan, 1988). In order to justify the importance of this nontraditional kind of education, early theoretical approaches attempted to define the important and unique attributes of Distance Learning.

Keegan (1986) identifies three historical approaches to the development of a theory of Distance Learning. Theories of autonomy and independence from the 1960s and 1970s, argued by Wedemeyer (1977) and Moore (1973), reflect the essential component of the independence of the learner. Otto Peter's (1971) work on a theory of industrialization in the 1960s reflects the attempt to view the field of Distance Learning as an industrialized form of teaching and learning. The third approach integrates theories of interaction and communication formulated by Badth (1982, 1987), and Daniel and Marquis (1979). Using the postindustrial model, Keegan presents these three approaches to the study and development of the academic discipline of Distance Learning. It is this concept of industrialized, open, nontraditional learning that, Keegan says, will change the practice of education.

Wedemeyer (1981) identifies essential elements of independent learning as greater student responsibility, widely available instruction, effective mix of media and methods, adaptation to individual differences, and a wide variety of start, stop, and learn

times. Holmberg (1989) calls for foundations of theory construction around the concepts of independence, learning, and teaching: Meaningful learning, which anchors new learning matter in the cognitive structures, not rote learning, is the center of interest. Teaching is taken to mean facilitation of learning. Individualization of teaching and learning, encouragement of critical thinking, and far-reaching student autonomy are integrated with this view of learning and teaching (Holmberg, 1989).

Holmberg summarizes his theoretical approach by stating that : Distance Learning is a concept that covers the learning-teaching activities in the cognitive and/or psycho-motor and affective domains of an individual learner and a supporting organization. It is characterized by non-contiguous communication and can be carried out anywhere and at any time, which makes it attractive to adults with professional and social commitments (Holmberg, 1989).

Garrison (1990) include in their essential criteria for formulation of a Distance Learning theory the elements of noncontiguous communication, two-way interactive communication, and the use of technology to mediate the necessary two-way communication and the preparation of online learning is necessary for students who lack the computer skills and that becomes a problem while studying online. Consequently, the fundamental computer and Internet training was launched to support them. The training has to provide real practice for more effective learning and provide an instructor giving advice for students' solutions and supporting them to construct their knowledge (Mingsiritham 2013)

Purpose of the Research

1) to study the opinions of students toward the topic of distance training packages on ICT.

2) to develop the distance training packages on ICT.

3) to study the learning progress of students using distance training packages on ICT.

4) to study the opinions of students toward the distance training packages on ICT.

Research Variables

1) An independent variable was a distance training package on ICT.

2) Dependent variables were the quality of a distance training package and the results of using a distance training package.

Research Hypothesis

1) A distance training package on ICT is effective according to an 80/80 criterion.

2) The students studying with a distance training package is expected to have made a progress with a statistical significance of .05.

3) The students have a high agreement with a distance training package.

Research Methodology

The current research has the methods covering: 1) population and samples, 2) a construction of research instruments, 3) data collection and 4) data analysis. The details are provided as below.

1) Population and Samples: The population used in the research was the 850 undergraduate students majoring in educational technology and communications in the faculty of education of Sukhothai Thammathirat Open University. The samples used in the research were of two groups. 1) The group used for the wants for the development of distance learning included 300 undergraduate students majoring in education technology and communications in the second semester of the academic year 2011. The group was derived by a simple random sampling. 2) The group used for the training package included 62 undergraduate students who were enrolled in the first semester of the academic year 2012, derived by a stratified random sampling.

2) Research Instruments : The instruments included the following. 1) The questionnaire on the wants for a distance training package was evaluated by three experts as ***'highly suitable'***. 2) The distance training package in four units: including common visual aids, information communications and technology and a self-development with a distance education, information technology and communication with a distance self-learning, technology and communications with a distance education. 3) a pre-test and a post-test of 40 items;8-items subjective exercises; a test of a difficulty value ranging between 0. 30-0. 80, a discrimination value ranging between 0. 20-0. 73 and a confidence value ranging between 0. 28-0. 92. 4) The questionnaire on the students' opinion towards a distance training package evaluated as ***'highly suitable'***.

3) Data Collection : The researcher had conducted the training package for three phases. 1) A survey was carried out on the wants in the development of the distance training package by gathering data from 300 undergraduate students in educational technology and communications. 2) The researcher had developed the package in question and the handbook by using an efficiency test process according to an 80/80 criterion. 3) The experiment consisted

of a face-to-face training and an online training via the Internet for a month. Data were collected after the training.

4) Data Analysis : The researcher had analyzed data in four aspects: data resulting from the needs for the development, data from the results of the package development, data on the evaluation of the quality of a distance training and data based on the results of the use of the package. Statistics used in data analysis were mean, standard deviation, and t-test.

Analyze the needs in developing and evaluate of the quality of a distance training package with mean and standard deviation. The researchers identified the interpretation of five rating scales as follows: 4.50 – 5.00 = Highest agree, 3.50 – 4.49 = High agree, 2.50 – 3.49 = Moderate agree, 1.50 – 2.49 = Low agree, 1.00 – 1.49 = Lowest agree

Research Finding

1) Results of a survey of the needs in developing a distance training package on information communications and technology

Table 1 Opinion regarding the needs to learn an information communications and technology (N = 300)

Items	$\overline{X}$	S.D.	Interpretation
1. At what level do you want to learn in distance learning?			
1.1 meaning of information communications and technology	4.37	.49	high agree
1.2 Importance of information technology and communication	4.36	.48	high agree
1.3 Types of information technology and communication	4.98	.14	highest agree
1.4 Roles of information technology and communication	5.00	.05	highest agree
1.5 Relevant policies on information technology and communication	4.37	.48	high agree
Total	**4.61**	**.32**	**highest agree**
2. At what level do you want to learn information technology and communication to develop yourself?			
2.1 Concept of information technology and communication for self-development	4.86	.48	highest agree
2.2 Use of information technology and communication for a self-development	4.86	.42	highest agree
2.3 Evaluation and results of information technology and communication with a self-development	4.85	.48	highest agree
Total	**4.85**	**.46**	**highest agree**
3. At what level do you want to learn the content of information communications and technology used in distance learning?			

Items	$\overline{X}$	S.D.	Interpretation
3.1 Concepts of information communications and technology and learning	4.86	.40	highest agree
3.2 Use of information communications and technology and learning	4.88	.42	highest agree
3.3 Evaluation and results of information technology and communication and learning	4.97	.18	highest agree
Total	**4.90**	**.33**	**highest agree**
4.At what level do you want to learn about the information technology and communication used in distance learning for training ?			
4.1 Information technology and communication for training	4.88	.40	highest agree
4.2 Use of information technology and communication for training	4.82	.47	highest agree
4.3Evaluation and results of information communications and technology and training	4.78	.49	highest agree
Total	**4.82**	**.45**	**highest agree**
All Total	**4.79**	**.39**	**highest agree**

From table 1 it was found that the respondents had needs for information technology and communication at a high level ($\overline{X}$ = 4.79, S.D. = .39). Considering separate items, it was found that 11 items were at the most desired level and 2 items were at a high level. The items with a maximum average was the role of information communications and technology ($\overline{X}$ = 5.00, S.D. = .05).

2) Results of the development of a distance training package on information technology and communication

Table 2 Efficiency of a distance training package in units 1 2 3 and 4

Unit	Exercise Scores (E_1) (Percentage)	Test Scores after training (E_2) (Percentage)	E_1/E_2
1	81.50	80.00	81.50/80.00
2	80.25	80.40	80.25/80.40
3	81.10	81.20	81.10/81.20
4	80.65	80.80	80.65/80.80

From table 2 it was found that the test of the efficiency of a distance training package showed the efficiency of 81.50 / 80.00, 80.25 / 80.40, 81.10 / 81.20 and 80.65 / 80.80 respectively. It was in accordance with the 80/80 criterion.

3) The results of an evaluation of a distance training package on information communications and technology used in distance learning

Table 3 Progress of the students trained with the distance training package in the field test (n=50)

Unit	test scores before training		test score after training		t
	$\overline{X}$	S.D.	$\overline{X}$	S.D.	
1	5.82	2.16	8.00	0.88	6.27*
2	5.82	2.43	8.04	0.98	6.17*
3	5.76	1.66	6.72	1.93	3.31*
4	5.16	5.79	8.12	6.39	6.62*

*p< .05 df(n-1) = 49 t = 1.676

Table 3 showed that the students who were trained with a distance training package had average scores higher than before with a statistical significance of .05.

4) Results of an evaluation of the use of a distance training package

Table 4 : Results of an evaluation of the use of a distance training package on information communications and technology used in a distance education for the students (n=50)

Items	$\overline{X}$	S.D.	Interpretation
1. Interesting content	4.46	.60	highest agree
2. Lecture through a distance lesson	4.41	.58	highest agree
3. Answering the questions by academic personnel through electronic devices	4.50	.60	highest agree
4.Details of a distance training package	4.52	.59	highest agree
5. Knowledge to be applied by the students	4.67	.51	highest agree
6. Passing knowledge to others at workplace	4.34	.64	highest agree
7. Training duration	3.95	.83	highest agree
8. Presentation strategies/ training methods	4.40	.75	highest agree
Total	**4.40**	**.64**	**highest agree**

From table 4 it was found that the students had evaluated the package at a high level. With details considered, it was found that three items were at the highest level: application of knowledge ($\bar{X}$ = 4.67, S.D. = .51), details of the package ($\bar{X}$ = 4.52, S.D. = .59), and answering the questions by the academic personnel through the electronic devices ($\bar{X}$ = 4.50, S.D. = .60).

The students had evaluated the training package at a high level in five items: interesting content ($\bar{X}$ = 4.46, S.D. = .60), lecture by the academic personnel through a distance lesson ($\bar{X}$ = 4.41, S.D. = .58),strategy of presentation/ training methods ($\bar{X}$ = 4.40, S.D. = .75), passing knowledge to others at workplace ($\bar{X}$ = 4.34, S.D. = .64) and training duration ($\bar{X}$ = 3. 95, S.D. = .83).

Discussions

1) Efficiency of a distance training package

It was found that the package was efficient according to the 80/80 criterion, which was in accordance with the set hypothesis. This was due to the fact that the package was experimented and used with three students. Then the package was improved and developed. After that it was used with a group of 9 students and 50 students respectively. In addition, the package contained the training content, the strategy of presentation of a distance training, knowledge and experience exchanging activities and knowledge base.

(1) The training content : It was the one resulting from a survey of the students' needs. As a consequence, the students who attended a training had a particular interest in it. As regards the students' opinion, it was found that their opinion on an application of knowledge was highest. The finding was in line with the ideas on the instructional development given by Gagne, Briggs and Wager (1992) who held that it was essential to analyze the basic necessity. Kemp (1985) found that a needs analysis was imperative prior to teaching and learning activities.

(2) Strategies of presentation of a distance training package : The package was developed by the researcher. It consisted of the illustrations. It had the contents in a step by step manner. It helped the learners to find it easy to learn. The students were more enthusiastic and the test scores after the training were gained according to the hypothesis. There was more progress. The findings were in conformity with a study by Kidanan Malitong (2000) who found that a multi-media lesson could make the learners able to learn to the best of their potential.

(3) Exchanging Activities : The researcher used a dialogue board to enable the participating students to express their opinion and exchange learning experiences with their friends. It meant that learning did not come from just the academic personnel, but it could come from a commonly share knowledge. The academic personnel played a supporting role. The point was in consistence with the study by Thanomporn Laohajarassang (2002) who explained that the teachers had to change their teaching roles from giving a content to helping and giving an advice. Besides, the teachers should be well-equipped with computer literacy.

(4) Knowledge base : The base linked the students to the knowledge sources in the same network. What the students had learned would be kept in a database. Training helped enhance their knowledge of the contents. The discussion was in line with the principles of Chaiyong Phomwong (2003) who found that external knowledge sources linked the students to the sources available in the network.

2) Quality of a distance training package

It was found that the students had an achievement after the training higher than before with a significance of .05. The finding was in accordance with the hypothesis.

(1) The training content contained pictures and sounds as well as lectures. That helped the students to understand better. As a result, they had higher scores than before.

(2) The students were required to do a multiple choice test.

(3) The topics designed by the researcher were important to the subjects of the students. They were keener in the contents and the activities. They were able to perform with higher scores. The point was in consistence with the study by Thepayapong Setkumbong (2012) who found that the competency of using information and communication technology of students who learned with e-learning, after learning was higher than before learning at .05 level of significance. And behavior of using information and communication technology was at good level.

3) Evaluation of a distance training package

It was found that the students who underwent the training were in agreement at a high level. The finding was in line with the hypothesis, especially the issues on application of knowledge, details of a training package and answers by the academic personnel through electronic devices.

It is obvious that a distance training package on information communications and technology used in a distance education is a process in constructing and developing a training package. It is important that the academic personnel have to give attention and answer the question raised by the trainees. Doing so can encourage them to have more interest and regularly participate in a process. That can affect the desired achievement.

Recommendations

1) Recommendations for application of the research findings

(1) Computers should be adequately available for all students. Light and temperature should be suitable. Other facilities should be provided. There should not be distraction or disturbances. The environments should be suitable for training.

(2) The students should be informed of the objectives and given a handbook on a distance training package.

2) Recommendations for further research

(1) Further research should be on the training content, action and dialogue through a web board. There should be a research on a distance participatory package.

(2) Further research should be on a distance training package with simulation so that the trainees can search what they want to learn from the real situations.

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