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Web-based Training on Knowledge Management for Vocational Teachers in Thailand

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ABSTRACT :

This Paper investigates when could be the most suitable occasion or the most feasible manner to apply knowledge management for vocational teachers in Thailand. Knowledge management is included in the principles of training for enriching professional knowledge and strengthening potential career development of vocational teachers under the national Office of Vocational Education Commission. So the objectives of this research were to 1) develop web-based training on knowledge management for vocational education teachers, 2) evaluate the efficiency of web-based training, and 3) compare the learning achievement of teachers between pretest and posttest. The sample group was 30 teachers of vocational education Institutions under the guidance of the Vocational Education Commission, trained by using web-based training on knowledge management. The instruments used in this study were the Moodle Learning Management System for training on knowledge management in 4 modules and an achievement test. The statistics used for data analysis were the mean, standard deviation and t-test dependent. The research results revealed that 1) the efficiency of the web-based training on knowledge management for vocational teachers indicated the mean score on practice exercises during training was 8.89, and after was 21.90. A percentage scoring on practice exercises during training was 88.96%, and after training was 87.60%. The study found that the web-based training on knowledge management for vocational teachers had the efficiency rating of 88.96/87.60; and 2) the comparative result of pretest and posttest learning achievement of teachers showed that the posttest learning achievement was significantly better ($p<0.01$) than the pretest learning achievement.

1. INTRODUCTION :

In the future there is more growing interest in using the Internet to deliver a training course than conventional media, such as videotapes or computer-assisted instruction. The Internet has enabled the delivery of additional forms and softwares of training more conveniently and effectively for distance learning. Clark defines the Web-based Training (WBT) as an individualized instruction delivered over the public or private computer networks, and displayed by a Web browser in the manner that is not possible without a Web; the content is not downloaded as Computer-Based Training (CBT) format, but rather on-demand training, stored in a server and accessed across a network. WBT is structured to meet and promote the training requirements with the content and facilitates multiple paths through the content in the networking system. It can also be updated very rapidly and access to the training content controlled by the training provider.

The Web-based Training is different from the training on Web exploitation. Teaching and learning about the Internet in Thailand is still training in the use of an Internet in a short course or workshop format. This teaching and learning is not considered exploitation of the Web for training. Thus,

WBI is instructional content formatted for efficient delivery over the World Wide Web that is effectively and systematically designed to integrate the training participants and the training administrator via the Internet system. To this end, it is formatted to serve the interactive needs on presentation, retrieval, discussion, and comment during the training via a tool of the WWW. According to the Royal Decree on Criteria and Procedures for Good Governance, B.E. 2546 (A.D. 2003), Section 11, states that the government agency, for result-based management under this Royal Decree, shall make itself to be global learning organization. For this purpose, the government agency shall acknowledge and analyze information in all aspects and shall then apply analytical result to its administration for correct, quick, and suitable service. The government agency shall also promote and develop capability, vision, attitude and collaborative learning of its officials. Consequently, the Ministry of Education agencies are committed to developing their professional staff and teachers having a sound understanding level in knowledge management. Knowledge management is considered as an intellectual tool for people in society, especially knowledge and wisdom associated with work and living. Teachers under the Office of Vocational Education Commission have good background knowledge in information technology skills and are well prepared for teaching and learning adaptation, as well as self-learning development, following the staff development guidelines of the Office of Vocational Education Commission. In addition, offices in charge of these activities were set up in the institutions; therefore, the development of Web-based Training on knowledge management is needed to benefit teacher training and to be used as a prototype Web-based Training for further development.

1.1 Web-based Training

An application of a Web-based Training is emphasized on characteristic concerns of the Web. As an online, distance learning and training, the Web-based Training must attain quality and effectiveness equivalent to conventional classroom training or better than that. The researchers establish the criteria and guidelines for the Web-based Training into 2 main characteristics as follows ;-

1. Web-based Training for education has three frames:

1.1 World Wide Web: the Web-based Training employs the computer network system, resulting that it is partly in the Internet system under a WWW frame;

1.2 Distance Education: the Web-based Training employs the computer network system and Internet system in distance education management and its results are under the frame of distance learning;

1.3 Instructional System Development (ISD): the Web-based Training employs the Internet and WWW system in distance learning management, requiring the design and development for good quality and efficiency, resulting in its operation under the frame of instructional system development.

2. Web-based Training for human development has three frames:

2.1 Information Technology (IT): human development on Web is the development in an IT era, which is the largest databank in the world. Web-based Training aims to develop human resource in an IT society by using WWW as a tool, resulting in an IT frame;

2.2 Informal Education: it is a part of distance education which aims at educating and training people at anytime and anywhere, resulting it in the same frame of distance education;

2.3 Human Resource Development (HRD): training is one of the HRD activities that include training, education and development. It is framed in the same as ISD frame.

New dimensions in training tools and procedures exhibit the benefits of the Internet utilization on training as follows:

1. Accessible to all Internet-connected sectors;

2. Training conducted on a basis of on-the-job training, whereas trainees are able to perform their regular work;

3. Cost cutting in food and accommodations, traveling expense, etc.;
4. Training can be performed in a 24-hour basis;
5. Self-directed basis that the training is provided as trainees' center by self-navigation;
6. Self-pacing basis that trainees can keep track of one's progress;
7. Content and lesson review at any time;
8. Questions and answers are asked and answered by the software tools on the Web Pages;
9. Discussions and feedbacks are made among trainees by the Internet system, such as emails or chat rooms;
10. No formality

Limitations in conventional classroom training enable the Web-based Training more attractive. WBT can serve the training participants in aspects of technology, readiness, motivation, flexibility, and practice activity.

1.2 Knowledge Management

Rhiensaowapak, et al. (2005) states in a book, ''Knowledge Management,'' published by the Office of the Public Sector Development Commission that knowledge management is classified into two categories:

1. Tacit knowledge is rooted in experiences, learning skills, or know-how of individuals. It is difficult to describe, but it is developmental and sharable;
2. Explicit knowledge can be articulated rationally and transmitted in forms of documents, specifications, and manuals.

When considering the ratio of tacit to explicit knowledge, it was found that tacit knowledge was more than explicit by 80:20. It is comparable to natural phenomenon like a glacier. Explicit knowledge is comparable to the top, above-the-water part of the glacier accounted for 20%; while tacit, embedded knowledge is to the bottom, below-the water part of the glacier accounted for 80%.

Nonaka & Takeuchi (1995) describe 7 recommendations on dynamic organizational knowledge creation as:

1. Create a knowledge vision;
2. Develop a knowledge crew;
3. Build a high-density field of interaction at the front-line;
4. Piggy-bag on the new product development process;
5. Adopt middle-up-down management style;
6. Switch to a hypertext organization;
7. Construct a knowledge network with the outside world.

Web-based Training is continually growing. There are a lot of research results showing its importance and necessity because of its convenience, cost saving, flexibility, and motivation. At present, LMS teaching and learning system plays a vital role, enabling the development and design of Web-based Training more convenient, especially in a demanding topic on knowledge management training. But the principles and methods in knowledge management are insufficient among a group of vocational teachers who have a lot of teaching loads, resulting in difficulty of managing their schedule in Web-based Training. As a result, the researchers develop the Web-based Training on knowledge management to be employed as a media for self-training of vocational teachers at any place and any time they need self-improvement.

1.3 Literature Review

Pienrungroj reports the models of computer training via Internet networks for primary school teachers under the Office of the Basic Education Commission that the objectives of the research are to:

1. Study problems and needs of computer training via Internet networks of primary school teachers under the Office of the Basic Education Commission;
2. Investigate opinions of experts on models of computer training via Internet networks of primary school teachers under the Office of the Basic Education Commission;
3. Propose models of computer training via Internet networks for primary school teachers under the Office of the Basic Education Commission.

The sample respondents recruited in this research consisted of 270 primary school teachers and 20 experts. The data were administered using questionnaires, and analyzed by application of 3-round Delphi technique to test the feedback and responses for consistency, with statistical analysis of percentage, median, and inter-quartile range. The results of analysis using Delphi technique found that:

1. Primary school teacher required the computer training via Internet networks that training contents were introduction to computer with self-practice activities and group practice. Supporting factors on computer training included academic resources related to the training topics that were acquired in the networks and outside the networks, additional software on the Internet, such as e-mail, web board, web page, chat room, and search menu, and, finally, interactions among trainees;

2. Experts agreed on the itemized list of models of computer training via Internet networks with 166 items out of 184 items;

3. Models of computer training via Internet networks for primary school teachers under the Office of the Basic Education Commission consisted of the following.

3.1 Preparation stages on training via Internet networks consisted of 10 elements, including 1) training objectives; 2) training curriculum; 3) training procedures and activities; 4) qualifications of a training provider; 5) functions and tasks of a training provider; 6) qualifications of a training participants; 7) training media; 8) methods of interactive participation; 9) training evaluation; and 10) follow-up assessment.

3.2 Training stages on training via Internet networks consisted of 1) training procedures including introduction to training models, group interaction, and practices on computer and internet application; 2) during-training procedures including presentation of training contents and activities during training; 3) training evaluation procedures including individual and group works, and on-line evaluation. Training activities were classified into 2 models: 1) activities conducted on internet networks including training practice activities, emailing, real-time chatting, related-training resource searching via the internet, topic establishment for discussion, Web communication, and individual and group work submission; 2) activities conducted on a training classroom including orientation, discussions on problems and obstacles, computer and internet practical training, and evaluation.

3.3 Evaluation stages included the assessment on theoretical and practical skills by using forms of questionnaire, test, and interview.

Phuttimanordikun studies the training model of Web-based Training for educational technologists. The objectives of this research are to investigate opinions of educational technologists to develop team learning skills for educational technologists; 2) to study the outcomes of Web-based Training utilization to develop team learning skills for educational technologists; and 3) to propose the training patterns and modules of Web-based Training to develop team learning skills for educational technologists. The research methods consisted of 4 steps: 1) creation of Web-based Training ; 2) study on opinions of the experts on modules of Web-based Training; experiments on Web-based Training exploitation; and 4) presentation of the Web-based Training of team learning skills for educational technologists.

The sample consisted of 2 groups: 1) 17 experts on educational technology, Web-based Training, and project and team learning; 2) 25 Computer Center's educational information staff recruited from Silapakorn University at 3 campuses: Tha Phra Palace Thalingchan campus, Sanamchandra Palace campus, and Petchburi Information campus. This group was divided into 5 teams, 5 persons for each team, participating in the program for 3 weeks. The research results revealed that:

1. Opinions of experts on modules of Web-based Training for educational technologists agreed that the training elements and procedures were suitable. Orientation and post-training seminars should be conducted in a training classroom.

Trainees should have face-to-face opportunities at least three times during training;

2. The training results revealed that the samples had scores in team learning skills and team-working efficiency higher than before training with a statistical significance of .05 and the samples had team working cooperation in a high level;

3. Models of Web-based Training for team learning skills of educational technologists consisted of 3 parts:

1. 10 training elements, including,

1) training objectives; 2) learning categories; 3) curricular; 4) roles of trainees; 5) roles of a training provider; 6) roles of experts and supporting staff; 7) Web-based interactive training methods and guidelines; 8) computer technology and networks; 9) Web-based Training supporting factors; and 10) training evaluation.

2. Training procedures consisted of pre-training including on-line registration and orientation; 6 training processes in project learning methods including missions and problems, data collection and analysis, planning, operation, summary, and output presentation. Training assessment procedures included assessments in team learning skills, team working efficiency, and team working cooperation.

3. Training activities included emails, web boards, chat rooms, network searching, and file transfer. Activities in a training class included orientation, operation planning, and post training seminar.

2. METHODS :

2.1 Population and Sample

The respondents used in this study were all vocational teachers from 404 colleges under the supervision of the Office of the Vocational Education Commission. Samples were recruited from volunteered vocational teachers, and 30 were randomly selected.

2.2 Research Tools

1. Web pages for vocational teacher training on Knowledge Management.

2. Assessment test papers on Knowledge Management training.

Research procedures were as follows:

1. Development of the Web pages training on knowledge management by analyzing and designing the contents from the materials on knowledge management, published by the Knowledge Management Institute. Assessment test papers were designed according to training contents including:

What is KM? Why do we do the KM?

Background knowledge prior to conducting KM

How to manage KM?

Tips on KM accomplishment

2. Investigating the curriculum and lessons on Knowledge Management by relying on fundamental knowledge management, written by Professor Wicharn Panich, M.D., Director of the Knowledge Management Institute.

3. Analyzing the contents and classifying into smaller units and setting learning objectives.

4. Designing lessons, teaching processes and browser formats, writing lesson introduction and recommendation; creating the Web pages by Moodle E-Language program.

5. Evaluating the lessons by experts on contents, media production techniques, and quality verification.

6. Experimenting the lessons examined and corrected by the experts with 3 teachers who have never studied KM contents before, to verify the errors. The lessons were tested in a seminar and training on Prototype Teachers organized by the Office of the Vocational Education Commission at Bangpoon Agricultural Engineering Training Center. Teachers took the experimental test and provided recommendations. The results showed that there were typographical errors in contents and some hyperlinks were not accessible to resources. Corrections and improvement were done for the next experiments.

7. Conducting the improved Web page experiment with a small group of 9 teachers who were not included in the sample group and had never learned the contents before at

Chonburi Technical College. The purpose of this experiment aims to check the errors by using a test paper composed of 35 items derived from the module. Scores obtained from the experiment were analyzed and showed a perfect score in the Web contents, except for some teachers who did not know how to access the system.

8. Conducting the improved Web page experiment with a group of 15 participants in MOODLE E-Learning training at the Office of Technical Education Development. The test paper used in this experiment was consisted of 35 items but only 25 items were selected in the actual research.

9. Employing the results taken from a sample group of 30 participants by recruiting from model teachers volunteering to join the research project. 36 teachers were asked to take the test before attending the training, and then they attended the Web-based Training on KM with 4 parts of content with exercises. The results were carried out by selecting teachers who completed the 4 parts of training for analysis to find the lesson efficiency by using the formula E1/E2 following efficiency on criteria of 80/80.

3. RESULTS :

After the researchers conducted the Web-based Training on KM for vocational teachers and statistical analysis of data were exhibited, the efficiency of the Web-based Training on knowledge management for vocational teachers found that the obtained mean score on practice exercises during the training was 8.89, and 21.90 after the training. A percentage scoring on practice exercises during training was 88.96 while the percentage after the training was 87.60. The Web-based Training on knowledge management for vocational teachers had the efficiency rate based on standard criteria by 88.96/87.60.The comparative result of pretest and posttest learning achievement of teachers showed that the posttest learning achievement was significantly higher ($p<0.01$) than the pretest learning achievement.

4. DISCUSSION & CONCLUSION :

The results of the research from the training of vocational teachers prompted the researchers to discuss the following.

1. The development of this Web-based Training of KM was created in compliance with the Web development processes from the content analysis of knowledge management by mind mapping. The content network and training objectives were constructed. Then the development was carried out by using a Moodle e-learning program to implement the contents in each part, and testing processes were conducted in each procedure from the beginning. Problems and errors had been solved and improved it for valid, practical training modules. Tests and efficiency of contents from 4 parts were conducted by employing scores taken from exercises done during the training and calculated for to determine the percentages accounted for 88.96%. When the training was finished, and all parts of contents were completed, all trainees were asked to take a posttest to evaluate regarding of what they have learned. The obtained scores exhibited an average rating of 87.60%. It indicated that the Web-based Training had efficiency compliant with its standard criteria by 80/80. Therefore, the objectives of this research were applicable and useful for the development and enhancement of vocational teachers' training.

The objectives of the research aim to train vocational teachers in any institutions who were lack of self-development for new trends in technology development. According to the government, limited budgets from this program will help reduce travelling expenses to training classrooms in many places simultaneously, because it is advantageous as on-line distance training which is systematic in effectiveness and proficiency without traveling expenses and trainer fees. (Rosenberg, 2006).

2. The development of the Web-based Training in knowledge management for vocational teachers exhibited complete procedures in Web development of content analysis, teaching and learning program design, Web-page development, various trial

experiments, and training assessments. Accordingly, scores obtained from pre-tests and post-tests taken by teacher revealed that pre- and post training achievement had statistical difference of .01 and it also indicated that the post-training achievement was apparently higher than pre-training. It also indicated that trainees were able to learn new contents by themselves with the Web-based Training by following the objectives of this research.

Web-based Training is new technology for training in every place because vocational college teachers can acquire new knowledge and train themselves at home or on-the-job training. In addition, it saves costs in travelling and accommodation in attending the seminar and training in a classroom or lecture room. It can be concluded that the utilization of Web-based Training in KM has no significant results from conventional, classroom training. Trainees are able to have higher learning achievement in knowledge management because the contents residing on the Web are prepared by experts or experienced trainers. Thus, on the basis of this study, it is recommended for future research that other areas of courses should be done to meet the needs of vocational teachers.

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