The Development of Web-Based Training for Job Competencies of Academic and Administrative Staff of King Mongkut's University of Technology North Bangkok

Panita Wannapiroon and Prachyanun Nilsook

***Abstract*—The purpose of the research study was to develop web-based training for job competencies of academic and administrative staff of King Mongkut's University of Technology North Bangkok. The sample groups were made up of 40 academics and 40 administrative staff working fulltime at KMUTNB. The research tools included the web-based training for developing job competency of both academic and administrative staff, the training achievement test, and the satisfaction questionnaire. The data were analyzed using the arithmetic mean, the standard deviation, and t-Test for dependence. The research results revealed that: The web-based training for developing job competencies of academic staff consisted of five units and another five units for administrative staff; The e-training model consisted of these four components: 1) principles, 2) objectives, 3) instructional process and 4) evaluation. The e-training process was divided into three stages: 1) the preparation before e-training, 2) the e-training with MIAP learning process divided into four stages of motivation, information, application, and progress, and 3) the summary of the results of training; Tthe academic and administrative staff trained with the web-based training to develop their job competency had statistically significant difference of the training achievement post-test scores from the pre-test scores at .01 level. Both academic and administrative staff agreed learning with the web-based training was highly appropriate.**

***Index Terms*—Web-Based Training, Job Competencies, MIAP, King Mongkut's University of Technology North Bangkok.**

I. Introduction

King Mongkut's University of Technology North Bangkok (KMUTNB) has realized importance of development of all governmental staff's job competencies because it is of the essence to their actual performance that further supports the organization's sustainable development. This realization has led KMUTNB to train its academic staff to be aware of their responsibility and understanding of pedagogical approach, components of education management, managing process of learning and teaching activities, testing and evaluation, and improvement of the academic staff to be competent in critical thinking skills. In addition, they should be competent in producing their own manuals of job descriptions, which will contribute to their own performance and the University in the future.

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Web-based training (WBT) is one of the efficiently training developmental tools, which employ the training process on a website so as to stimulate learners' learning enthusiasm. The argument behind this is that website can boost their motivation in learning and expressing their opinions at all time, which is a new dimension of tools and training process [1].

MIAP teaching approach is a process experiential learning that is operated by teachers through these four steps: 1) motivation; 2) information; 3) application; and 4) progress. The aim is to enable learners to acquire knowledge and skills in accordance with the set course objectives and improve their professional competency [2].

The KMUTNB staffs from academic and administrative lines are seen to be competent in information technology skills. Therefore, they prompt to adjust their ways of learning and teaching, and they always need to develop their skills. In order to respond such a need, the University has initiated a project to develop a web-based training, which is related to job competency to benefit both academic and administrative staff. This project would be a pilot study for future web-based training for other staff.

II. Objectives

1) To examine theoretical framework of web-based training for both academic and administrative staff's job competencies at KMUTNB.
2) To develop web-based training for both academic and administrative staff's job competencies at KMUTNB.
3) To study KMUTNB academic and administrative staff's achievement before and after their participation in the developed web-based training.
4) To study KMUTNB academic and administrative staff's satisfaction with the developed web-based training.

III. Hypotheses

1) KMUTNB academic staff's achievement is significantly higher after they participate in the web-based training.
2) KMUTNB administrative staff's achievement is significantly higher after they participate in the web-based training.

IV. Scope of Study

A. Population and Sampling Group

Population is 154 KMUTNB staff whose work is in a

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period of probation, less than three years. Of this number, 94 work in an academic line while 60 in an administration line.

The sampling group is the total number of 80 KMUTNB staff whose work is in a period of probation, less than three years. Forty of them work in an academic line and another 40 in an administration line.

B. Research Variables

Independent variable is web-based training for job competencies of academic and administrative staff of KMUTNB. Dependent variables are achievement in web-based training and satisfaction the training.

C. Theoretical Framework

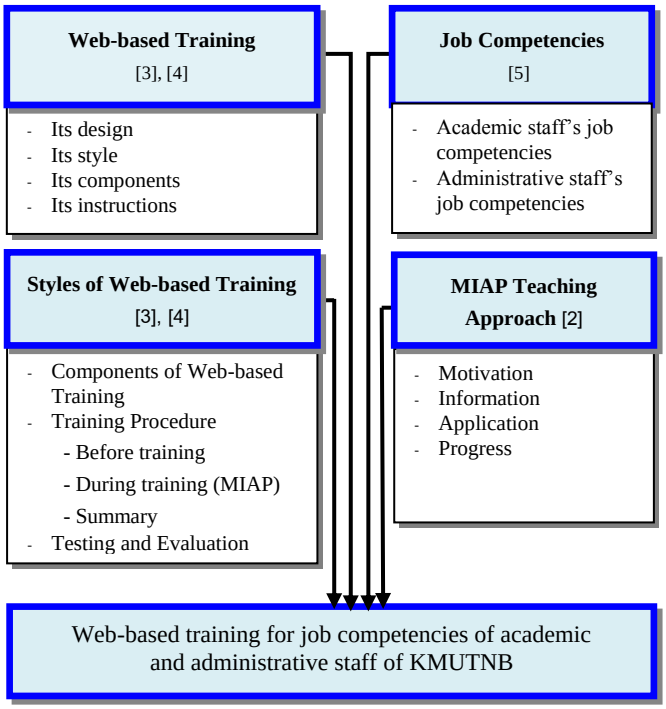

Fig. 1. Theoretical framework of web-based training for job competencies of academic and administrative staff of KMUTNB.

V. Research Procedure

This experiment is research and development, which comprises three stages.

A. Stage 1: Development of Theoretical Framework of Web-Based Training for Job Competencies of Academic and Administrative Staff of KMUTNB

1) Synthesize literatures pertinent to the training, styles of e-Training in the areas of component, procedure, activity, and testing and evaluation of training.

2) Examine framework of tertiary academic staff's job competencies as follows:

- Synthesize literatures pertinent to tertiary academic staff's job competencies in order to determine framework of in-depth interviews;
- Create in-depth interview form of tertiary academic staff's job competencies. Have five specialists assessed its content and construct validity;
- Conduct in-depth interviews with 15 participants in regard to "knowledge management in job competency that academic staff want to know" by using the in-depth interview form of academic staff's job competencies;
- Conclude the interview findings; and
- Conclude theoretical framework of tertiary academic staff's job competencies according to the synthesis of relevant literatures and the outcomes of in-depth interviews.

3) Investigate framework of tertiary administrative staff's job competencies as follows:

- Synthesize literatures relevant to both academic and administrative staff's job competencies so as to determine the framework during focus group discussion;
- Organize a focus group discussion (FGD) with the Head of each department of each faculty and the Department of Human Resources and Administration. This totals 46 people. The discussion is held within the topic of "knowledge management in job competency that academic staffs want to know". Determine the process of evaluation and criteria in measuring the achievement;
- Summarize the outcomes of FDG as well as both academic and administrative staff's job competencies; and
- Summarize the framework of both academic and administrative staff's job competencies from the synthesis of pertinent literatures and the outcomes of FDG.

4) Summarize the theoretical framework of KMUTNB academic and administrative staff's job competencies.

B. Stage 2: Development of KMUTNB Academic and Administrative Staff'S Job Competencies with MIAP Teaching Approach

1) Analysis

Analyze content of academic and administrative staff's job competencies. Draw content diagrams, determine unit lessons including main and sub topics, and draw diagrams to initiate scope of study.

2) Design

This stage involves design of:

- Training objectives to set up objectives for each main and sub topic as well as behavioral objectives;
- Content network to show connection and sequence of content;
- Content module to display content of each unit, which consists of main and sub topics;
- Story board of web-based training; and
- Strategy of web-based training for academic and administrative staff following activities of MIAP teaching approach comprising for steps: Motivation, Information, Application, and Progress.

3) Development

This stage involves development of:

- Organizing content and activity in knowledge management system;
- Manuals of web-based training for system master and for users; and
- Achievement pre-test and post-test for both academic and administrative staff.

4) Implementation

- Implement one-to-one testing by asking groups of three academic and administrative staff who do not

participate in the study to observe and give their views on use of the web-based training. Their views include problems and recommendations. Collected data are then used to develop the web-based training.

- Implement small group testing by asking groups of five academic and administrative staff who do not participate in the study to use the developed one-to-one web-based training, observe and give their views if there are problems and recommendations. These data are then employed as a means to improve the web-based training.
- Implement field trial by asking groups of fifteen academic and administrative staff who do not participate in the study to use the improved small group web-based training.

Validate the achievement test of the staff's job competencies by asking 15 of the academic staff to measure it statistically with Cronbach's Alpha Coefficient. R is 0.75 and P ranges between 0.36 and 0.72.

Validate the achievement test of the staff's job competencies by asking 15 of the administrative staff to measure it statistically with Cronbach's Alpha Coefficient. R is 0.86 and P ranges between 0.45 and 0.75.

5) Evaluation

This stage involves evaluation of:

- Developed content and manual of web-based training. These tools are evaluated by five specialists and are then revised according to their comments.
- Quality of web-based training in the areas of design and technique. The web-based training and its manual initially developed are evaluated by five specialists and are then revised according to their comments.

C. Stage 3: Study of the academic and administrative staff's learning outcomes in the web-based training

This stage involves one group pretest-posttest design [6], which follows the steps below:

1) Preparation before the training

- Prepare computer laboratory including computer, network system and relevant programs.
- Prepare a plan for training in management system of the web, instruction manuals for both trainees and trainers, and research tools.
- Explain the training objectives, procedure and activities, testing and evaluation, and practice of the management system of the web-based training.

2) Participation in the developed web-based training

- Measure levels of achievement before training.
- Proceed the web-based training initially developed.
- Measure levels of achievement after training.
- Ask the research participants for satisfaction of the web-based training.

3) Conclusion of use of the web-based training

- Conclude and compare the achievement differences between before and after training of the participants using t-test dependent
- Analyze data of the participants' satisfaction with mean and standard deviation.

D. Research Tools are in the following:

1) The in-depth interview form for job competencies;
2) The focus group discussion form for job competencies;
3) The evaluation form of the web-based training in content, design and technique;
4) The web-based training for job competencies of academic and administrative staff;
5) The questionnaire to measure achievement; and
6) The satisfaction of the web-based training questionnaire.

VI. Conclusion

A. Part 1: Conclusion of Theoretical Framework of the Web-Based Training for Job Competencies of Academic and Administrative Staff.

1) The web-based training model

- Components of the web-based training comprise the following: 1) principles, concepts and basic theory; 2) training objectives; 3) training procedure and activities; and 4) testing and evaluation of training.
- The web-based training involves three steps: before, during and after. The second step particularly employs MIAP teaching and learning approach, which associates these four phases - motivation, information, application and progress. The third step is about testing and evaluation of the training
- Framework of the web-based training for job competencies of academic and administrative staff consists of The KMUTNB regulations, requirements, orders and announcements regarding staffing and job descriptions.

B. Part 2: Result Conclusion of the Web-Based Training for Job Competencies

1) The web-based training for job competencies of KMUTNB academic and administrative staff;

- The content and activity management of the web-based training for the academic staff are created by using MOODLE LMS and it can be accessed to http://www.etraining.kmutnb.ac.th comprising 11 topics: training course description, objectives, main topics, sub-topics, web board, chat board, chat rooms, bilingual glossary, pre-test, post-test, and satisfaction questionnaire on use of the web-based training for job competencies. The content used in the training for the academic staff is divided into five parts: KMUTNB regulations, KMUTNB requirements, KMUTNB announcements of staffing and job descriptions, KMUTNB announcements, and OCSC announcement.
- The content and activity management of the web-based training for the administrative staff are created by using MOODLE LMS and it can be accessed to http://www.etraining.kmutnb.ac.th comprising 11 topics: training course description, objectives, main topics, sub-topics, web board, chat board, chat rooms, bilingual glossary, pre-test, post-test, and satisfaction questionnaire on use of the web-based training for job competencies. The content used in the training is divided into five parts: KMUTNB regulations, KMUTNB requirements, KMUTNB announcements of

staffing and job descriptions, KMUTNB announcements, and OCSC announcement.

- The quality results of the web-based training for job competencies of the academic and administrative staff evaluated by the specialists are shown below in Table I.

TABLE I: THE QUALITY RESULTS OF THE WEB-BASED TRAINING FOR JOB COMPETENCIES

Quality Evaluation	$\bar{X}$	S.D.	Appropriateness
content	4.78	0.42	Highest
design of training system	4.65	0.48	Highest
design of webpage	4.44	0.51	High
technique	4.75	0.44	Highest

From Table I, the quality results of the web-based training for job competencies reveal that its content, design of training system and technique are the most appropriate. Its design of webpage is highly appropriate.

Fig. 2. Homepage of the web-based training for job competencies of the academic and administrative staff

C. Part 3: Conclusion of Use of the Web-Based Training for Job Competencies

1) The comparative results of achievement in the web-based training for job competencies of the 40 academic staff and 40 administrative staff are displayed in Tables II and III below.

TABLE II: THE COMPARATIVE RESULTS OF ACHIEVEMENT IN THE WEB-BASED TRAINING FOR JOB COMPETENCIES OF THE ACADEMIC STAFF BEFORE AND AFTER THE TRAINING

Training Achievement	Total Marks	$\bar{X}$	S.D.	t-test	Sig.
before	40	23.20	4.02	20.04**	.00
after	40	32.54	2.71		

**p < .01

Table II indicates the comparative results of achievement in the web-based training for job competencies of the academic staff before and after the training that they significantly achieve in training at .01 level.

From Table III indicates the comparative results of achievement in the web-based training for job competencies of the administrative staff before and after the training that they significantly achieve in training at .01 level.

TABLE III: THE COMPARATIVE RESULTS OF ACHIEVEMENT IN THE WEB-BASED TRAINING FOR JOB COMPETENCIES OF THE ADMINISTRATIVE STAFF BEFORE AND AFTER THE TRAINING

Training Achievement	Total Marks	$\bar{X}$	S.D.	t-test	Sig.
before	40	20.44	6.14	14.60**	.00
after	40	30.35	2.95		

**p < .01

2) The satisfaction results show that both academic and administrative staff are happy with the web-based training for job competencies at the highest level ($\bar{X}$ = 4.56, S.D. = 0.57).

VII. DISCUSSION

A. The results of the Web-Based Training for Job Competencies in Eleven Topics are Parallel with Training Concepts Addressing These Four Main Components [7].

The first is presentation, which includes message, graphic and motion picture with audio and sound effect. The second is interaction; the third is database management. The fourth is learning and teaching supports such as electronic board – BBS, web board, e-mail, and online chat. The five-part contents used in the web-based training are also in line with concept of job competency divided into three types [8]. The first is key competence, followed by job competence and technique.

Components of the web-based training style, training procedure and activities using MIAP can improve achievement in job competency. Trainees are highly satisfied with the training which is in accordance with Polnil's research outcomes [9] that MIAP is an appropriate for professional activity management. In addition, the five processes of MIAP are analysis and design, preparation for lesson plans, teaching, learning processing and evaluation, MIAP can improve learners' achievement and they are highly satisfied with the training as well [10].

B. The Results of the Web-Based Training for Job Competency

The academic and administrative staff's achievement after the training is significant at .01 level. This achievement demonstrates that the developed web-based training can improve the staff's job competencies; the web-based training can affect trainees' learning behaviors, participation in training and satisfaction [11].

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REFERENCES

[1] M. J. Rosenberg, *Beyond e-learning: approaches and technologies to enhance organizational Knowledge, learning, and performance*, San Francisco, U.S.: John Wiley & Sons Inc, pp.72, 2006.

[2] S. Sirisukbool, *Technique and MIAP Teaching Approach*, Bangkok, Thailand: King Mongkut's University of Technology North Bangkok Press, 1984, pp. 45-47.
[3] W. Horton, *Designing web-based training: How to teach anyone anything anywhere anytime*, New York, U.S.: John Wiley & Sons, 2000, p.26.
[4] C. J. Bonk, and C. R. Graham, *Handbook of blended learning: Global perspective local designs*, San Francisco, U.S.: Pfeiffer. 2004, pp. 3–21.
[5] Human Resource Management Division, *Job Competencies of Academic and Administrative Staff of King Mongkut's University of Technology North Bangkok*, Bangkok, Thailand: King Mongkut's University of Technology North Bangkok Press, 2009, pp.15-25.
[6] W. William, and G. J. Stephen, *Research methods in education: an introduction*, 9th ed. Boston, U.S.: Pearson, 2009, p. 125.
[7] T. Kilby, "The direction of Web-based training: a practitioner's view," *The Learning Organization*, vol.8, no 5, pp.194-199, October 2001.
[8] P. Sanprasan, and other, *Nursing Management to Learning*, Bangkok, Thailand: Sukhumvit Printing, 2005, pp. 85-86.
[9] C. Polnil, "*A workshop on developing skills of repairing the electronic fuel injection system in the electronic fuel injection system work subject in the vocational certificate curriculum at Auto mechanic and Mechanical Technology Department, Ubon Ratchathani Polytechnic College*," M.S. thesis, Dept. Education, Rajabhat Udonthani University, Udonthani, Thailand, 2008, Abstract.
[10] A. Jindanurak, "*Development of Teaching Math with MIAP*," M.S. thesis, Dept. Industry, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand, 2010, Abstract.
[11] P. Piriyasurawong, and P. Nilsook, "Web-based Training on Knowledge Management for Vocational Teachers in Thailand," *Asian Journal of Distance Education*, vol. 8, no 2, pp.65–71, August 2010.

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