

# Model for Development of Professional Competencies of Physical Education Teacher in 21<sup>st</sup> Century in Educational Innovation and Information Technology

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**Abstract** - The purposes of this study were: to determine competency development need of physical education teachers in the Institute of Physical Education for physical education teacher enhancement in 21<sup>st</sup> century educational in innovation and information technology; to create model of competency development on the professional standard of physical education teacher in Institute of Physical Education; to study the effectiveness of the competency model development. Questionnaires were used for collecting the data from 148 samples who were physical education teachers in Institute of Physical Education. Then the researcher analyzed and synthesized the results from the questionnaires with related literatures and researches for creating a model by focus group for competency development. Consequently, the researcher proposed the created model by panel of 10 experts in information technology and physical education, and 15 physical education teachers for examining the effectiveness of competency model with the given criterion at 80/80. The statistics used in this study were mean, standard deviation and t-test (one sample t-test type). The research results indicated that the competency development needs of physical education teachers in order to develop educational innovation and technology were at a highest

level as a whole and each aspect. The components of competency model development consisted of 1) determination of competency development need, 2) examination of competency development suitability and possibility, 3) creation of competency model, the efficiency of which was higher than the given criterion at 80/80 (the research results were 84.33/81.54), 4) training, and 5) evaluation of the competency model development. The effectiveness after training was higher at the statistical significance level of 0.05.

**Keywords** - Educational Innovation and Information Technology, Competency, Physical Education Teacher, Teacher Competencies

## I. INTRODUCTION

Nowadays the trend of technological change has an effect on human lifestyle. As a result, there is more intellectual competitiveness with up-to-date information. Individuals who have expertise of knowledge acquisition will have an advantage in life. Information and communication technology is one of the keys for knowledge acquisition and people's development in the 21<sup>st</sup> Century. Today we live in a digital age. If we can apply information technology to achieve maximum benefit for living, we can survive in fast paced

information changes. ICT will make people know how to use information technology to its full capacity along their ability. In that respect, there is need to develop capabilities and skills in this field seriously to be the ideal people in the 21<sup>st</sup> Century.

There are many factors for learning, Teacher is one of the factors who will support and develop the learner to achieve the learner in the 21<sup>st</sup> century. Information and communication technology skill is very important, so the teacher must have knowledge, comprehension and good attitude including performance and basic ability of innovation and information technology, selection to accept and decline, Accessing to knowledge through application for the benefits of creativity and ethical utilization. Also, teacher will be the first group that all parties give priority to. Since the experience and knowledge of information technology can provide the knowledge for a learner, who wants to be the citizen in the 21<sup>st</sup> century; therefore, it is absolutely necessary for teachers to develop their performance in innovative and communication technology for teaching and encouraging the learners' ICT literacy skill, learning how to select to accept and decline. Technology awareness and selection to use technology effectively are also important [1].

Teachers in the 21<sup>st</sup> century are the teachers in the age of Globalization, so they must have wide knowledge in technology and innovation. They also have to develop their own technology's ability as follows: Experience, they must have experience in teaching with new technology; Extended, they must have skills for extending their body of knowledge through the media technology all the time; Expanded, they must have ability for passing on knowledge from themselves to the learners through the media technology; Evaluation, they must have good evaluation and justice skill and can use technology for evaluation; End - User, they need to use a variety of media technology with best effectiveness; Enable, they can use technology to create tutorials and additional contents for teaching and use

software and hardware to create the lessons. At least they can create the presentation by Power Point to influence students' learning attention or use various authoring tools to create electronic learning lessons; Engagement, they can share knowledge with learners or colleagues such as communication through social networks leading to new ideas, suggestion and have teacher's community on the internet; and efficient and effective, they can use technology fluently, be creators, providers, and users who use that knowledge to benefit the learners as much as possible. Also, they can use information and communication technology for education in the 21<sup>st</sup> century appropriately [2].

## **II. RESEARCH OBJECTIVES**

The objectives of this research were: 1) to determine competency development need of physical education teachers in the Institute of Physical Education for physical education teacher enhancement in 21<sup>st</sup> century educational in innovation and information technology, 2) to create model of competency development on the professional standard of physical education teacher in Institute of Physical Education, and 3) to study the effectiveness of the competency model development.

## **III. SCOPE OF STUDY**

### **A. The Population and the Sample Study**

The research population for this investigation were the physical education teachers who work at Institute of Physical Education. There were 375 subjects in this study. The samples were 148 teachers selected by Simple Random Sampling method.

### **B. Research Instruments**

The research instruments comprised:

1. A questionnaire with 55 items of competency and needs for development of physical education teachers in the Institute of Physical Education for teacher professional enhancement in 21<sup>st</sup> century educational in innovation and information technology.

2. Data recorded form from Focus Group

3. Training achievement test containing 50 items and reliability (KR-20) at 0.82.

#### IV. RESEARCH METHODOLOGY

##### A. Procedures

1. The first stage was designed to study competency development needs in educational innovation and information technology

- analyzing and synthesizing the data from related document and research.
- investigating competency development needs by questionnaire

2. The second stage was designed to create model of competency development on the professional standard of physical education teachers

- designing the model of physical education competence development in educational innovation and information technology

• examining the created model by panel of experts in information technology and physical education

- finding the efficiency of the created model by trying out the created model competency with the physical education teachers three times by small group method (3 subjects, 6 subject and 9 subjects), and large group method (15 subjects)

3. The third stage was designed to find the effectiveness of the created model

- trying out the created model with the sample group
- indicating the effectiveness of the competency model

The model for development of professional competencies of physical education teacher in 21<sup>st</sup> century in educational innovation and information technology is shown as the given fig 1.

##### B. Data Collection

Questionnaires were used for collecting the data from 148 samples who were physical education teachers in Institute of Physical Education. Then the researcher analyzed and synthesized the results from the

questionnaires with related literatures and researches for creating a model by focus group for competency development. Consequently, the researcher proposed the created model by panel of 10 experts in information technology and physical education, and 15 physical education teachers for examining the effectiveness of competency model with the given criterion at 80/ 80.

##### C. Data Analysis

The data from competency development need were analyzed by mean, standard deviation and the data analysis of competency model effectiveness was conducted by t-test (one sample t-test type).

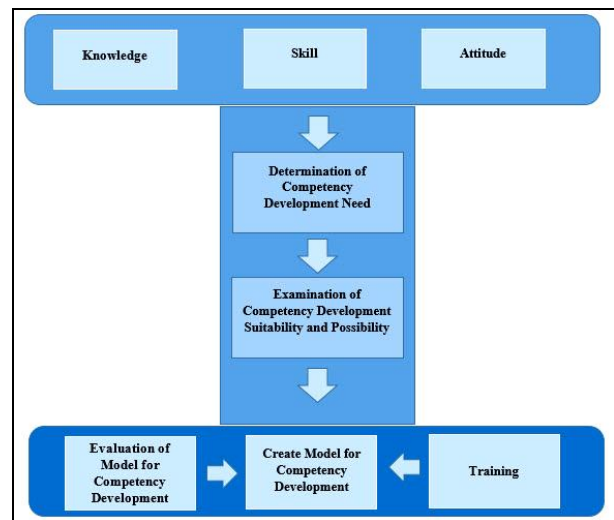


Fig 1. Model of Competency Development Physical Education Teacher

#### V. RESULTS

1. The teacher’s development competencies need on educational innovation and information technology shown as the following:

**TABLE I  
MEAN AND STANDARD DEVIATION  
AND QUALITY EVALUATION  
ON DEVELOPMENT COMPETENCY NEED**

Competency	M	S.D	Meaning
1. Knowledge	4.22	.83	highest
2. Skill	4.23	.94	highest
3. Attitude	4.39	.85	highest
<b>Total</b>	4.28	.95	highest

The table I showed that the development competency need mean score of the knowledge was 4.22 while the mean score of the skill was 4.23 and the mean score of attitude was 4.39, all of part were at a highest level.

**TABLE II  
MEAN AND STANDARD DEVIATION  
AND QUALITY EVALUATION  
ON DEVELOPMENT COMPETENCY  
OF KNOWLEDGE**

Competency	M	S.D	Meaning
1 Fundamental Knowledge of Information and communication technology	4.14	.93	high
2. Knowledge of basic computing concepts	4.06	.99	high
3. Knowledge of common software applications	4.23	.90	highest
4. Knowledge of compute application for internet access and electronic communication	4.18	.86	high
5. Information technology utilization regarding laws, morals, ethics and safety	4.19	.95	high
6. Technology use for instructional design	4.31	.98	highest
7. Media and technology development for electronic learning	4.32	.80	highest
8. Knowledge sharing by using educational information technology	4.30	.77	highest
<b>Total</b>	<b>4.22</b>	<b>.95</b>	<b>highest</b>

The three highest mean scores were found as the following: media and technology development for electronic learning, technology use for instructional design and knowledge sharing by using educational information technology.

**TABLE III  
MEAN AND STANDARD DEVIATION  
AND QUALITY EVALUATION  
ON DEVELOPMENT COMPETENCY OF SKILL**

Competency	M	S.D	Meaning
1. Basic computer application	4.06	.99	high
2. Software application	4.23	.90	highest
3. Program utility	4.17	.94	high
4. Internet utilization	4.18	.86	high
5. application for instructional development	4.32	.80	highest

6. Media and technology development for electronic learning promotion	4.33	.80	highest
7. Knowledge sharing by using educational information technology	4.31	.77	highest
<b>Total</b>	<b>4.23</b>	<b>.93</b>	<b>highest</b>

The three highest mean scores were found as the following: media and technology development for electronic learning promotion, application for instructional development and knowledge sharing by using educational information technology.

**TABLE IV  
MEAN AND STANDARD DEVIATION AND  
QUALITY EVALUATION ON DEVELOPMENT  
COMPETENCY OF ATTITUDE**

Competency	M	S.D	Meaning
1. Appreciation of instructional importance and advantages	4.34	.85	highest
2. Interest and advancement follow-up in new technology	4.33	.84	highest
3. Investigation and distribution of knowledge in educational innovation and technology	4.48	.81	highest
4. Information technology utilization regarding laws morals, ethics and safety	4.41	.80	highest
5. Information technology utilization in other aspects such as thinking and decision making.	4.23	.95	highest
6. Self-development by participating the training on information technolog	4.43	.80	highest
7. Participation of knowledge sharing by using social network	4.51	.74	highest
8. Self-learning for new information technology	4.41	.75	highest
<b>Total</b>	<b>4.39</b>	<b>.95</b>	<b>highest</b>

The three highest mean scores were found as the following: investigation and distribution of knowledge in educational innovation and technology, participation of knowledge sharing by using social network, and self-development by participating the training on information technology.

2. The research results indicated that the competency development needs of physical education teachers in order to develop educational innovation and technology were at a highest level as a whole and each aspect. The components of competency model development consisted of 1) determination of competency development need, 2) examination of competency development suitability and possibility, 3) creation of competency model, the efficiency of which was higher than the given criterion at 80/80 (the research results were 84.33/81.54), 4) training, and 5) evaluation of the competency model development.

3. The effectiveness after training was higher at the statistical significance level of 0.05.

**TABLE V  
COMPARISON OF TRAINING ACHIEVEMENT**

Experiment	n	$\bar{X}$	S.D	t	Sig
Pre-test	15	23.47	2.03	29.08*	.00
Post-test	15	45.53	2.06		

\* Level of Significance .05

The table V showed that the training achievement mean score of the pre-test was 23.47 while the mean score of the post-test was 45.53. The mean scores were statistically different at level .05 of significance. The mean score of post-test was higher than that of the pre-test.

## VI. DISCUSSION AND CONCLUSION

1. From the study of competency development need of physical education teachers in the 21<sup>st</sup> century, it was found that physical education teachers in the Institute of Physical Education need to develop their knowledge, skill and attitude about educational innovation and information technology. This is consistent with the research [3].

- The need for developing knowledge of physical education teacher is to improve their knowledge for adjusting the media to support learning, using technology to create the lessons, applying basics computer program

and internet applications that conform to the related research [2]. Because the internet is a huge source of learning for learners, modern study aid in the 21<sup>st</sup> century, the learners can search the data from various sources around the world.

- The need for developing skills is to use innovation and information technology in education. There were seven competencies: 1) using basic computer, 2) using basic program, 3) using utility, 4) using internet, 5) improving media and using technology for learning, 6) using media and technology to support learning, and 7) sharing knowledge by using information technology in education. The most requirement skill is to improve media and use technology for learning which include 5 sub competencies. Physical education teachers need to improve skill for teaching by designing the lessons with e-Learning and teaching with e-Learning systems. To use online evaluation They should provide digital media lessons through the internet [4]. This meets Ramkhamhang University's research through e-learning, for teaching it was found that e-learning is very useful. Teachers need to have a trial for teaching e-learning before class and also seeking more information when using e-learning systems. For developing e-learning for Institution of education in Thailand it was found that they use e-learning as supporting media. Some Institutions did not take action about this seriously as well as the institution of physical education using e-learning as a supplement due to lack of the knowledge and skills to create the lessons with e-learning.

- The need for developing attitude of physical education teachers is to have good attitude about the study, research and disseminate the knowledge of innovation and information technology for education. They improve themselves by attending the workshop on information technology in education. Most teachers in the Institute of Physical Education appreciate the importance and benefits of using technology for teaching.

2. The created model comprising five stages: 1) studying the need to improve

performance, 2) determining the suitability and feasibility of developing competencies, 3) Creating and finding the efficiency of developing competency model, 4) training, and 5) Evaluating competency model was accordance with Castetter's concept [5] which proposed four step process development 1) Identification of the need to develop, 2) Personal development planning, 3) Implement the development plan, and 4) Evaluation the development. This is consistent with the related research [6].

3. The effectiveness of competency development model in the 21<sup>st</sup> century in educational innovation and information technology was found that the achievement after training was higher than that before training at the statistical significance level of 0.05. This is because the created model were designed to find the efficiency before the try-out and were examined by the panel of experts. This is in accordance with the related research [7], that is the study of developing innovation and technology performance's model by the standards of teachers college of business administration and the effectiveness of the model showing that the scores after training was higher statistically significant at the 0.05 level.

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