

Development of a Training Model Integrating Information and Communication Technology into Innovation and Lateral Thinking Processes to Enhance University Instructors' Capabilities of Creative Instructional Design

การพัฒนากระบวนการฝึกอบรมที่บูรณาการเทคโนโลยีสารสนเทศและการสื่อสาร ในกระบวนการนวัตกรรมและการคิดนอกกรอบ เพื่อเสริมสร้างความสามารถในการออกแบบการสอนอย่างสร้างสรรค์ สำหรับอาจารย์สถาบันอุดมศึกษา

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ 1) เพื่อศึกษาสภาพการออกแบบการเรียนการสอนโดยใช้เทคโนโลยีสารสนเทศ และการสื่อสาร และการสร้างนวัตกรรมทางการศึกษา สำหรับอาจารย์สถาบันอุดมศึกษา 2) เพื่อศึกษาความคิดเห็นของผู้ทรงคุณวุฒิเกี่ยวกับ (ร่าง) รูปแบบการฝึกอบรมที่บูรณาการเทคโนโลยีสารสนเทศและการสื่อสารในกระบวนการนวัตกรรมและการคิดนอกกรอบ เพื่อเสริมสร้างความสามารถในการออกแบบการสอนอย่างสร้างสรรค์ สำหรับอาจารย์สถาบันอุดมศึกษาและ 3) เพื่อสร้างรูปแบบการฝึกอบรมที่บูรณาการเทคโนโลยีสารสนเทศและการสื่อสารในกระบวนการนวัตกรรมและการคิดนอกกรอบ เพื่อเสริมสร้างความสามารถในการออกแบบการสอนอย่างสร้างสรรค์ สำหรับอาจารย์สถาบันอุดมศึกษาโดยใช้ค่าคะแนนเฉลี่ยร้อยละกลุ่มตัวอย่างที่ใช้ในการศึกษาสภาพการออกแบบการเรียนการสอนโดยใช้เทคโนโลยีสารสนเทศและการสื่อสารและการสร้างนวัตกรรมทางการศึกษาในครั้งนี้เป็นอาจารย์จากสถาบันอุดมศึกษาทั่วประเทศแบ่งตามภูมิภาคจำนวน 400 คน โดยวิธีการต่อไปนี้ 1) สุ่มแบบแบ่งกลุ่มจากอาจารย์ผู้สอนในสถาบันอุดมศึกษาทั่วประเทศ ทั้งภาครัฐ และภาคเอกชน จำนวน 155 แห่งทั่วประเทศ ได้ทั้งสิ้น 9 กลุ่ม ดังนี้ ภาคเหนือตอนบนภาคเหนือตอนล่างภาคตะวันออกเฉียงเหนือตอนบนภาคตะวันออกเฉียงเหนือตอนล่างภาคกลางตอนบนภาคกลางตอนล่างภาคตะวันออกภาคใต้ตอนบนและ ภาคใต้ตอนล่าง 2) สุ่มแบบสัดส่วน โดยการสุ่มจากจำนวนอาจารย์ผู้สอนในสถาบันอุดมศึกษาในแต่ละภูมิภาค ดังนี้ ภาคเหนือตอนบน จำนวน 9 คน ภาคเหนือตอนล่างจำนวน 6 คน ภาคตะวันออกเฉียงเหนือตอนบนจำนวน 6 คน ภาคตะวันออกเฉียงเหนือตอนล่างจำนวน 9 คน ภาคกลางตอนบนจำนวน 39 คน ภาคกลางตอนล่างจำนวน 21 คน ภาคตะวันออกจำนวน 3 คน ภาคใต้ตอนบนจำนวน 2 คน และ ภาคใต้ตอนล่างจำนวน 3 คน และ 3) สุ่มแบบอย่างง่าย ด้วยการจับฉลากเลือกภูมิภาค ภูมิภาคละ 5 มหาวิทยาลัย

เก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม พบว่า 1) อาจารย์ส่วนใหญ่ยังไม่ได้ออกแบบรายวิชาตามกระบวนการออกแบบและพัฒนาการเรียนการสอน และสอนแบบเผชิญหน้าเป็นหลัก มีส่วนน้อยที่สอนแบบออนไลน์ และยังมีอาจารย์เป็นส่วนน้อยที่มีประสบการณ์การสร้างนวัตกรรมการเรียนการสอน 2) ผู้ทรงคุณวุฒิเห็นด้วยกับเทคนิคการคิดนอกกรอบของ Dr. Edward De Bono และขั้นตอนการฝึกอบรมออนไลน์ 3) รูปแบบที่พัฒนาขึ้นประกอบด้วยระยะการฝึกอบรม 3 ระยะ และในแต่ละระยะของการฝึกอบรมก็จะประกอบไปด้วยขั้นตอนต่าง ๆ ดังนี้ ระยะที่ 1 ระยะปฐมนิเทศ ประกอบไป

ด้วย 1) ปฐมนิเทศการฝึกอบรม 2) แนะนำเครื่องมือแบบออนไลน์ และแบบเผชิญหน้า 3) ประเมินคุณลักษณะการคิดนอกกรอบก่อนการฝึกอบรม 4) แนะนำเนื้อหาการฝึกอบรม ระยะที่ 2 ระยะฝึกการคิดนอกกรอบ ประกอบไปด้วย 5) เข้าสู่การฝึกอบรมด้านการออกแบบการเรียนการสอน 6) เข้าสู่การฝึกอบรมด้านการคิดนอกกรอบ 7) ระบุปัญหาการเรียนการสอนโดยเทคนิคการคิดนอกกรอบ 8) ออกแบบการเรียนการสอนด้วยเทคนิคการคิดนอกกรอบ และระยะที่ 3 ประเมินผลโครงการฝึกอบรม ประกอบไปด้วย 9) ประเมินคุณลักษณะการคิดนอกกรอบหลังการฝึกอบรม และ 10) ประเมินผลโครงการฝึกอบรม

คำสำคัญ: กระบวนการนวัตกรรมการเรียนการสอน การคิดนอกกรอบ การออกแบบการเรียนการสอนอย่างสร้างสรรค์ เทคโนโลยีสารสนเทศและการสื่อสาร

Abstract

The objectives of this research were to investigate technology-based instructional design and instructional innovation of university instructors and to survey educational experts' opinions towards a training integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design and create a training program for them. The subjects were 410 instructors from regional higher educational institutions in Thailand sampling by: 1) cluster sampling from population comprised of 215,775 instructors from 155 public and private universities in Thailand to 9 regional upper north, lower north, upper northeast, lower northeast, upper central, lower central, eastern, upper south and lower south 2) Proportion Sampling from population of 9 regional: upper north 9 instructors, lower north 6 instructors, upper northeast 6 instructors, lower northeast 9 instructors, upper central 39 instructors, lower central 21 instructors, eastern 3 instructors, upper south 2 instructors and lower south 3 instructors and 3) simple sampling by raffle 5 university from 9 regional.

The data were collected through questionnaires. The result revealed that most of the subjects did not follow the principle of instructional design and development when designing their instruction. They mostly applied face-to-face instruction, and quite a few of them did online instruction. In addition, a few of them had experience in creating instructional innovation. In terms of experts' opinions, it was found out that the experts agreed with the lateral thinking techniques suggested by Dr. Edward De Bono and the online training process. The training would be divided into 3 phrases: first phrase: orientation there were 1) orientation 2) introduced instruments for classroom and online training 3) pre evaluation for lateral thinking characteristic 4) provide basic knowledge, second phrase: lateral thinking practice there were 5) instructional design expert training 6) lateral thinking expert training 7) identified problem of learning and teaching using lateral thinking technique 8) instructional design by using lateral thinking technique, and third phrase: training project evaluation, there were 9) post evaluation for lateral thinking characteristic 10) evaluate training project.

Keywords: Process innovation, Lateral thinking, Creative instructional design, Information communication technology

Introduction

Creative instructional design means a principle or process through which instruction is designed and developed to come up with a new systematic body of theoretical knowledge reaching the instructional objectives to solve instructional problems. This research applied the ADDIE model to the design of instruction. The ADDIE model includes five stages: analysis, design, development, implementation, and evaluation (Tubsree, 2009). The outcomes of creativity may generate new knowledge, plans, or products (Anderson & Krathwohls as cited in Hiranrak, 2013).

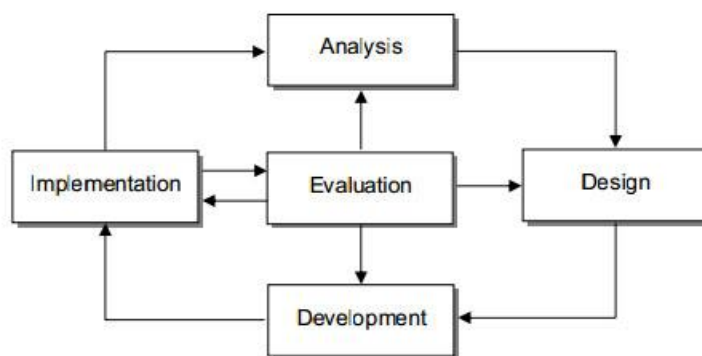


Figure 1. The ADDIE Model

To design creative instruction, instructor needs to integrate his creativity into principles of instructional design. Creativity is not an inborn talent; it requires practice. Dr. Edward De Bono whose lateral thinking theory is well-known identified “7 lateral thinking techniques” including 1) focus, 2) concept extraction, 3) concept fan, 4) random input, 5) challenge, 6) reversal provocation, and 7) escape provocation. It is not necessary to practice all the 7 techniques. A person can practice only one of the techniques and repeat practicing them regularly. Following this, that person could have a better creative thinking process and could use the process whenever he or she wants (De Bono, 1970; Thanyathorn, 2009)

To enhance instructors’ knowledge of principles of instructional design and lateral thinking techniques, it is essential for them to be mainly provided with blended trainings which include face-to-face, classroom, and online trainings through the Learning Management System (LMS) which helps save training time, not wasting instructors’ teaching and working time (Chantape & Thammametha, 2011).

Objectives of the Study

1. To investigate technology-based instructional design and instructional innovation of university instructors

2. To survey educational experts' opinions towards a draft training model integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design

3. To create a training program integrating lateral thinking into information and communication technology (ICT) in process innovation to enhance university instructors' capabilities to design instruction creatively

Conceptual Framework

1. Independent variables are training formats integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design.

2. Dependent variables are capabilities to design instruction creatively.

Research Methodology

Stage 1: researching the technology-based instructional design and instructional innovation of university instructors

1) Population

The population comprised of 215,775 instructors from 155 public and private universities in Thailand.

2) Samples

The samples were 400 instructors from public and private universities in Thailand. The sample size was calculated using Taro (1970) formula with a 95% confidence level.

3) Instrument

The instrument was a questionnaire surveying technology-based instructional design and instructional innovation of university instructors. The questionnaire assessed by 5 experts to ensure the effectiveness of the instrument comprised questions to collect data in terms of instructional design and instructional innovation.

4) Data analysis

The data analysis was divided into two parts: (1) demographic data presented through frequency and percentage, and (2) instructional design and innovation data presented through mean and standard deviation values.

Stage 2: surveying experts' opinions towards the training program integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design

1) Population

The population in stage 2 comprised of experts in the fields of education, lateral thinking, and instructional design. They had at least 5 years of experience in ICT and/or were renowned authors of research papers or textbooks of instructional design.

2) Samples

The samples were 3 experts in the fields of education, lateral thinking, and instructional design. They had at least 5 years of experience in ICT and/or were renowned authors of research papers or textbooks of instructional design. The samples were sampled using the purposive sampling method.

3) Instrument

The instrument was a semi-structured interview for opinions towards the training program integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design. The semi-structured interview was developed to meet related theories and checked for completeness.

4) Data collection

Data were obtained from the experts' opinions towards the training.

5) Data analysis

The data obtained from the interview were analyzed, interpreted, and summarized using the content analysis.

Stage 3: creating a training integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design

The researchers created a training integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design following these steps.

1) Studying related theories and the data obtained from the expert's opinions

2) Drafting training formats

Results

1. The results in terms of technology-based instructional design and instructional innovation of university instructors are summarized as follows:

1.1 The result revealed the demographic result showed that most of the respondents were 30-40 years old (65.2%). Most of them had 6-10 years of teaching experience (38%) and had doctoral degrees (56.5%).

1.2 The result of teaching planning based on the ADDIE model is detailed as follows:

1.2.1 Analysis

1.2.1.1 Analysis of instructional problems to plan instruction

Most instructors were found to analyze the problems by learning information from other instructors or students (78.75%).

1.2.1.2 Analysis of students

Most instructors were found to analyze the students, mainly observing their learning methods (78.75%).

1.2.1.3 Analysis of course contents

Most instructors were found to analyze the course contents, mainly learning objectives as required by the courses (80.75%).

1.2.2 Design

1.2.2.1 Most instructors were found to write down a list of class activities in detail for each learning unit, using it as the case study for instructional design (73.25%).

1.2.2.2 To design instruction for each learning unit, most instructors determined their teaching methodology, following the problem-based learning principle (70.50%).

1.2.2.3 Most instructors still used offline teaching and learning materials including documents, textbooks, and supplementary class materials (85.25%). Quite a few of them were found to use online ones.

1.2.2.4 To evaluate students' learning performance, most instructors still used in-class and after-class testing (77.00%).

1.3 The result in terms of instructional innovation showed that most instructors never thought of inventing their instructional innovation (56.80%).

2. The training integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design was separated into 3 phases:

2.1 Orientation Phase

This phase is an orientation including an (1) introduction of training program

details, training objectives and goals, (2) offline and online tools, (3) trainers as well as evaluation of trainees' the characteristic of lateral thinking and (4) overview content for training.

2.2 Lateral Thinking Practice Phrase

2.2.1 (5) Instructional Design training (face-to-face)

2.2.2 (6) Lateral thinking training (face-to-face)

2.2.3 Online training including (7) identification of instruction using the lateral thinking technique, "Focus" and (8) instructional design using the lateral thinking technique, "Random word"

2.3 Training Project evaluation

This phrase included an (9) evaluation of trainees' the characteristic of lateral thinking and (10) training project evaluation

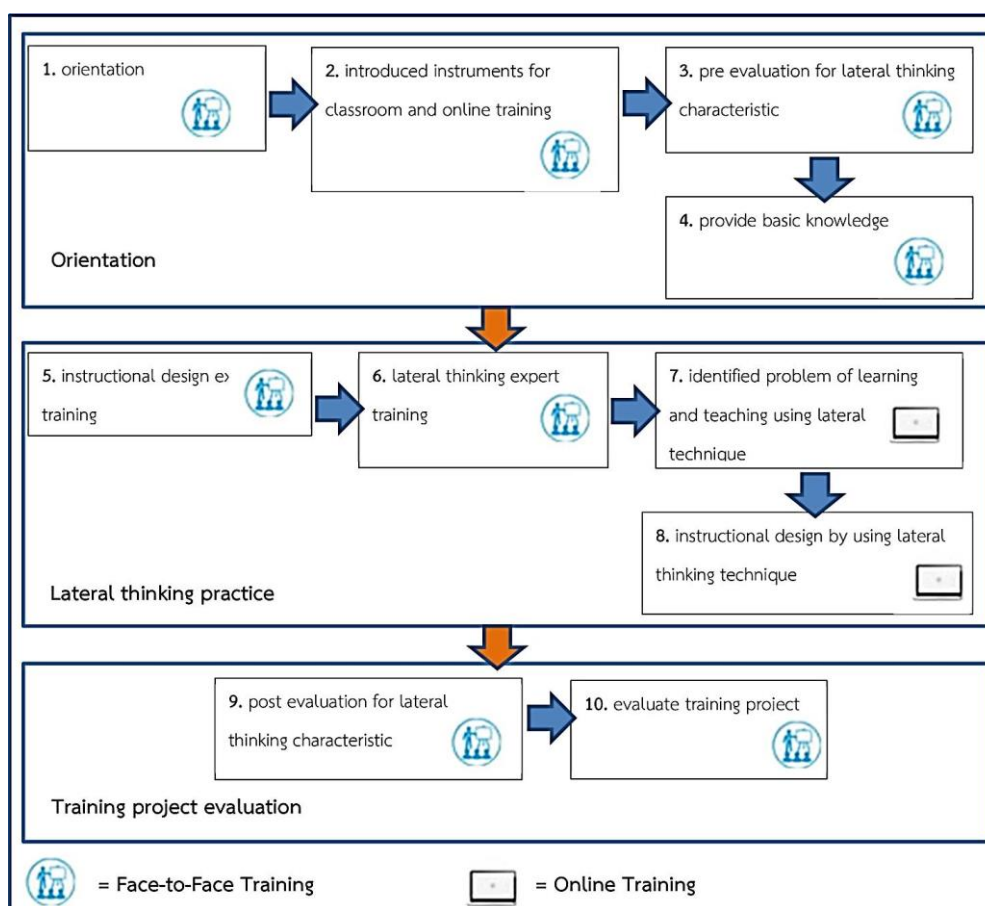


Figure 2 The Process of Training Model Integrating Information and Communication Technology into Innovation and Lateral Thinking Processes to Enhance University Instructors' Capabilities of Creative Instructional Design

Discussion

The results are discussed as follows:

1. Instructional planning following the ADDIE model

1.1 Analysis

1.1.1 To plan their instruction, most instructors analyzed their instructional problems they experienced in their courses by asking those who were related to their instruction including other instructors and students. However, the analysis could not be applied to all problems as some were caused by different factors. Therefore, to analyze them, instructors should emphasize an observation of classroom environment, prioritize the problems found, and learn other instructors' successful and unsuccessful solutions to the problems they had experienced.

1.1.2 To analyze their students, most instructors observed their personalities and learning methods. It is necessary for them to emphasize other factors, such as their basic knowledge, attitude, learning motivation, and achievement motivation. Additional research on documents and studies on levels of intelligence (good, fair, and poor) to come up with appropriate learning evaluation criteria is needed.

1.1.3 To analyze the course contents, most instructors mainly studied course descriptions and learning objectives as required by the courses. It is necessary for them to analyze and synthesize the contents of their courses as well as arrange the contents in order of difficulty and integrate the course content into other fields of study, following the course learning objectives to reach the learning goals.

1.2 Design

1.2.1 In terms of class activities, most instructors got used to using the cases they previously experienced to support students individually. They should ensure the appropriateness of the instructional design to instructional activities; some activities require different methods. For instance, use of storylines is appropriate for knowledge connection teaching as the method can enhance students' understanding and thinking skills.

1.2.2 In terms of instructional design, most instructors determined their teaching methodology for each learning unit, following the case-based learning principle. Indeed, an instructor can apply a variety of teaching methods, starting from the problem-based learning method in the early of the course followed by the flipped classroom method during the middle and the project-based learning method for presentation during the final.

1.2.3 In terms of teaching and learning materials, most instructors still used offline materials – documents, textbooks, and supplementary class materials. Quite a few of them used online ones. Indeed, online materials can sometimes substitute paper materials. In case there is no change in the course content, all materials can be made online so that students can study on their own wherever and whenever they want. Online exercises and tests are also possible to be online or included in an online application. Instructors can find their calculation of scores easy and convenient and online materials help reduce use of paper as well.

2. In terms of instructional innovation, most instructors had no experience of inventing instructional innovation for their own use. Most of them still did not really understand instructional innovation. In fact, to create instructional innovation, a creator needs to think laterally. Lateral thinking requires practice. A number of techniques are available today. One of them was introduced by Dr. Edward De Bono, 7 Lateral Thinking Techniques, is effective. Those techniques include Focus, Concept Extraction, Concept Fan, Random Input, Challenge, Reversal Provocation and Escape Provocation. Instructors can follow one of those techniques and repeat practicing it to become lateral thinkers.

Recommendations

The goal of the training model integrating information and communication technology into innovation and lateral thinking processes to enhance university instructors' capabilities of creative instructional design to encourage instructors to think outside the box and not to depend on conventional teaching styles. Instructors are recommended to think laterally, started practicing the first technique regularly and moved to further techniques after doing the first well. Following this, they could become lateral thinkers who could solve all instructional problems, coming up with effective solutions on their own.

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