

A Guideline for Promoting Creative Educational Innovation and Filing Patent for Pre-service Teachers in Thailand

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Abstract

The purposes of the study were; 1) to compare the results of creative educational innovation and filing patents for pre-service teachers between 2017 and 2020 academic years and 2) to create a guideline for promoting creative educational innovation and filing patents for pre-service teachers. The samples were two groups of pre-service teachers; 520 pre-service teachers in 2017 academic year and 416 pre-service teachers in 2020 academic years. The research instrument were questionnaires and the data were analyzed by mean, standard deviation (SD), and t - test statistic. The results were the following; 1) The perspectives from the two groups of pre-service teachers toward instructional media and filing patent, were statistically significant with level differences of .05. 2) The guideline has 6 processes; 1) Acquire knowledge 2) Identify problems 3) Plan and data searching 4) Create instructional media 5) Try out and improve and 6) Prepare document for filing the patent. The contributing factors of successful creative educational innovation were from inspirations and their teachers.

Keywords: Educational innovation, pre-service teacher, patent

1. INTRODUCTION

The higher educational institutes aim to develop all level of gradulators to receive the certificates to meet with the requirements and expectations of the various entrepreneurs and to be accepted in the international level. Therefore, universities must manage their curriculums and prepare their students to jobs such as assigning the learners to practice and create the innovation following their own interest leading to the creative product development. [1]

If considering teacher responsibilities, one of the important works that need to be done during their careers is to create educational materials or instructional media. Creating new learning media is considered a challenge according to [2] which explained that higher educational institutes encourage their students to produce their own innovations by changing knowledge and interact to their teachers and friends who expertise in different fields as the result of the process can instruct new knowledge and a deep understanding of the work. [3] and also the

pre-service teachers can search for information and gain new knowledge from social media to invent instructional media. So, it is important for pre-services teachers to be trained to construct educational medias or materials. Moreover, Science, Technology, Engineering, and Mathematics (STEM) has been the foundation for discovery and technological innovation. [4] In 2018, The study of 520 pre-service teachers in Thailand found that pre-service teachers created educational products namely invention, instructional media storytelling book covers (67.12%). And when pre-service teachers were assigned challenging tasks, they will be proud having completed the tasks effectively. [5] [6] They also learned on how to apply the intellectual property laws in order to protect and enforce the rights for their works.

The application for patent protection must be applied immediately, to prevent any negative losses that may occur. The new inventions which can be applied for patent should have the following conditions in accordance with [7]. The

three patent types available in Thailand are as follows: 1) Patent for Invention Example of invention protected: New product or process, improvement for example in the following fields: machinery, tools, chemicals, biotechnology, etc. with period of 20 years protection (non-renewable) 2) Petty Patent Example of invention protected: New invention which would qualify for an invention patent except that it has no strong, technical innovative steps with a period of protection for 10 years (non-renewable). 3) Patent Design and Examples of inventions being protected: Ornamental aspects or aesthetics of an article that includes features pertaining to the shape, configuration or pattern with period of protection for 10 years (non-renewable). [4]

As mentioned above, it is essential for pre-service teachers to create new inventions to enhance their teaching performance and must be apprehended as it is important to protect their intellectual property rights. Hence, the guidelines for promoting creative educational innovation and patent filing for pre-service teachers is presented in the study, the details are as follows.

1. Research Objectives

The main purposes of this paper were 1) to compare the results of creative educational innovation and filing patents for pre-service teachers between 2017 and 2020 academic years and 2) to create a guideline for promoting creative educational innovation and patent filing for pre-service teachers.

2. Samples

The samples were two groups which consists of pre-service teachers coming from 8 universities in the academic year of 2017 and 416 pre-service teachers from the faculty of education of

Bansomdejchaopraya Rajabhat University in the academic year of 2020.

3. Instrument

The questionnaires were utilized to study opinion and perspective about the study and knowledge of creative products development and filing a patent. The researcher generated questions and adjusted the questions from the local and international related questions by using the validation of question processes and by implementing the try out process. Then, the researcher distributed the questionnaires and inspected the tools and internal consistency of reliability of tools by finding the Cronbach's Alfa coefficient (α - coefficient) which equals to .944 showing Its reliability, then adjusted and distributed them to undergraduate pre-service teachers.

4. Data Collection

The data was collected by using questionnaires in two conducting periods; The first period was between August-October, 2017 and there were 520 questionnaires collected or a 98.48 % response rate. The second period was in March 2021, were in 416 questionnaires were collected or a 86.67 % response rate.

5. Data Analysis

The data were analyzed by mean, standard deviation (SD), and t - test statistic.

2. RESULTS

The comparison between the opinions of pre-service teachers in different academic years was divergent with statistical significance in many aspects. The different of opinions between pre-service teachers in 2017 academic year and pre-service teachers in 2020 academic year in each items were described in table I.

TABLE I: The comparisons between opinions of pre-service teachers in 2017 academic year (n=520) and pre-service teachers in 2020 academic year (n=416) in instructional medias creation and new innovation

Lists	Group	Mean	SD	t	p
You can do research in order to create new inventions by yourself.	2017	3.52	0.79	-4.720*	.000
	2020	3.76	0.80		
You can implement the inventions affectively.	2017	3.82	0.77	-1.667*	.096
	2020	3.90	0.82		
You can select appropriate resources for creating innovations.	2017	3.80	0.76	-3.987*	.000
	2020	4.00	0.74		
When facing any problem, you can solve it appropriately.	2017	3.76	0.72	-2.882*	.004
	2020	3.90	0.73		
You are apprehended before making a decision or taking an action.	2017	3.88	0.77	-3.707*	.000
	2020	4.07	0.75		
When facing the problem, you are attempting to find new and creative solutions.	2017	3.79	0.75	-2.465*	.014
	2020	3.91	0.76		
You can adapt the old idea to create new inventions.	2017	3.78	0.73	-3.935*	.000
	2020	3.97	0.74		
You can assess the possibilities to create a new product effectively.	2017	3.81	0.73	-2.542*	.011
	2020	3.93	0.69		
You can determine the value of a product which you have created.	2017	3.83	0.69	-3.152*	.002
	2020	3.98	0.74		
. You search for needed information insistently	2017	3.94	0.77	-2.264*	.024
	2020	4.06	0.75		

*p < .05

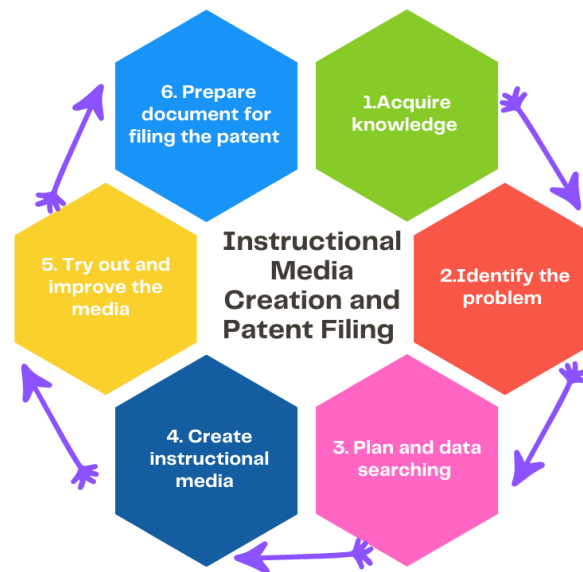
The guideline for promoting creative educational innovation and patent filing for pre-service teachers has 6 processes;

1. Acquire knowledge: learning about how to create instructional medias, educational inventions and intellectual property
2. Identify the problems: addressing problems by searching for information and possibility to implement instructional inventions to solve the problems.
3. Plan and data searching: searching for information about contents, educational resources and all related information.

4. Create instructional media: preparing materials and creating a blue print of instructional media

5. Try out and improve the media: implementing instructional media and collecting the data to improve the products.
6. Prepare document for filing the patent: if the instructional inventions meet the criteria for patent applications, prepare all the required documents then draft the application and file for the patent.

FIGURE I Guidelines for promoting creative educational innovation and patent filing for pre-service teachers



Moreover, the study also found that the contributing factors of successful creative educational innovation were from inspirations and recommendation in supervision of their teachers.

3. DISCUSSION

From the results of the study, it is recommended that applying creative based-learning is favourable in creating instructional media or educational innovations for pre-service teachers. [8] which corresponds to [9] which stated that driving learning experiences and promoting team collaboration for searching information and brainstorming can promote interpersonal communication skills through problem solving, collaborative work and by working as a team. Moreover, [10] and [11] also pointed out that appreciation and abashment leads to learning, and readiness in preparation of pre-service teachers for their future careers.

Besides, [3]; [12] recommended that pre-service teachers should search for knowledge from social media and encourage each other to protect their legal rights in intellectual property before

implementation and dissemination of their instructional inventions. And [13] also indicated that patents are one of the criteria for universities ranking and plays an important role in the economic sector by expanding trade and increase business values. Hence, [14] also recommended that universities should spread the information of intellectual property knowledge by coordinating with the academic office/department so that they will expand their knowledge of intellectual property, and understand the process of patent application.[4]

Recommendations

It is recommended that pre-service teachers should be encouraged to create instructional medias or educational inventions by themselves and it is important to file a patent under the advice of their advisers. Also by developing a positive attitude towards their work and disseminate their instructional inventions in benefiting others can make them be proud of themselves and by being more confident which can boost their readiness in their future careers.

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