Exploring creativity elements that can be identified in design thinking activity

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Abstract: The purpose of this study is to explore what adult learners experience in design thinking activities and to explore the creativity factors that can be identified through them. For this purpose, 38 students from 20-55 age group of at the G Institute of H University in Seoul were compared with the changes of creative thinking after education after studying design thinking. Research shows that design thinking is an effective experience in developing creative thinking and creativity for adult learners. In addition, we can confirm that design thinking has a positive effect on changing the way of thinking of adult learners, and is an effective way to improve problem solving ability in the process of specifying and realizing problems. Therefore, this study has a great significance in that the education using the design thinking process leads to the creativity of the learners as a creative tool for approaching the change of the thinking method and solving the practical problem. In the future, it is necessary to carry out empirical research on design thinking education for the creative thinking and creativity of adult learners as a task of cultivating core human resources.

Keywords: Design thinking, Creativity, Creative thinking, Creative activities, Creativity elements

INTRODUCTION

What is the background of the study?

Today, society and culture focus on the development of future human resources that can lead the fourth industrial revolution as the most important task and focus on creating educational environment and strengthening future human resources capacity. These changes in social emotions and perceptions are driving the evolution into a future educational environment. And Changes in 21st century core competency that adapt to new roles and environments in the future that are expected to undergo various changes are also a major issue. The importance of creativity is emphasizing the ability to cope with changing environments and complex challenges (National Institute for Lifelong Education, 2016). Despite the demands of this age, today's teaching methods in Korea are unilateral (Noh, 2016). In this paper, we propose a new type of learning system that enables learners to communicate with their peers in a collaborative way. Therefore, it is very important to innovate the rigid education method and to enable the expression of the creative capacity of the learners in the direction of changed education.

The concept of design thinking is a methodology for creative or innovative outcomes as a way to innovate the current way of education (Yoo, 2016). Design Thinking is widely used as a user-centered, field-oriented philosophy that transcends the field of specialization and field. Among these, the step of deriving the idea is presented as an important process to find a practical solution to the problem raised in particular.

As a result, the success of design thinking depends on how innovative (Koo, 2017). Therefore, in order to effectively promote creativity, it is necessary to conduct training based on the context and context in which creativity is required (Richads, 2010). Therefore, the purpose of this study is exploring to what participants experience in design thinking activities and to provide implications for the basis of creativity that can be confirmed through them.

What is the research question?

This study is a study on creativity through ideas development activities in design thinking program. In the first stage, theoretical considerations on creativity and design thinking were discussed, and in the second stage, experiments were conducted to evaluate creative competence through ideas. The subjects of

this study were 38 adult learners aged 20-55 years. After 2 days of design thinking training, they evaluated the change of creative thinking before and after the education. At the final stage, the results of the experiments were analyzed and the conclusions were drawn.

THEORETICAL BACKGROUND

What is creative activity?

Creativity is the ability to create new and useful output, and creating new output requires diverse facets (Park & Kim, 2017). Major countries in the world are focusing on the 21st century skill to cultivate creative talents to cope with the changes of future society (Kim, 2016). Based on this, recently, as a requirement of creative talent, there are many studies that emphasize creativity.

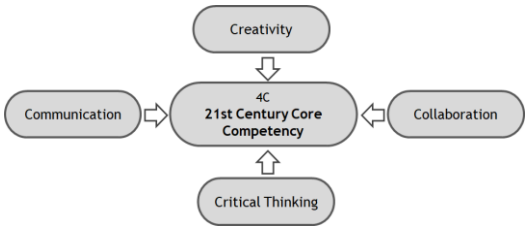

Figure 1. 21st Century core competency 4C

What is the concept and process of design thinking?

The origins of design thinking began with Nobel economics winner and cognitive scientist Simon, and although Simon's book 『The science of artificial』 did not mention words of design thinking, the characteristics of artificial science research are similar to those of design thinking (You, 2018). Simon's study defined "design as an intellectual act to achieve an intention to change the present state better" (p. 88), and then in 1973 by design engineer Mckim's 『Experiences in Visual Thinking』, 1987 In Rowe's 『design thinking』, the concept of design thinking has been used for decades, and the framework of design thinking and various theories have been established (Choi, 2013). After the design revolution, in the era of Industrial Revolution, the nostalgic design that styled mass-produced products has recently had a 'meaning to solve something creatively for better results' (Lee, Yoon, & Kang, 2014). Design Thinking is a process of inferring a solution to a given problem (Kang & Lee, 2014). Based on human-centered thinking, the method finds problems to be solved in the real world and positively proposes solutions to them. In this process, it induces creative ideas and makes meaningful thinking possible (Seo, 2017).

The process of design thinking is divided into five stages: empathy, problem definition, idea generation, prototyping, and testing. Typically, Stanford D-school and IDEO CEO Tim Brown (2014) presented the method. Finding the core problem in the design thinking process is the most important process. After that, I will come up with many ideas for problem solving, select the best planner in it, and repeat the failure and improvement by going through the production and testing process. (Lee, Park, & Kwon, 2016). In particular, they experience diffusion and convergence in the process of finding ideas, which is often called the creativity technique (Koo, 2017).

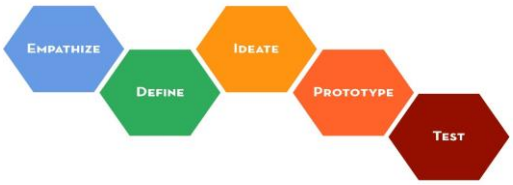

Figure 2. Design thinking process

What is design thinking and creative activity?

Creativity is based on analytical thinking and intuitive thinking, and design thinking refers to a balance of dynamic interaction and a fusion idea (Martin, 2009). Tim Brown (2009) pointed out that most of the students do not develop creativity and overlook it because they are focused on analytical and convergent thinking, while design education and creative activities are carried out within the school (Kwon, 2017). In addition, it is important to develop future talents who have a design mind.

As creativity has a complex feature with various sub-factors (Amabile, 1996; Sternberg, 2004), it is difficult to see that the whole part of creativity is developed by developing only one factor (Kim, 2011; Torrance, 1988). Creative activities need to understand convergent thinking, integrated approach, problem finding and solving process, and technical aspects (Lee & Choi, 2014). Therefore, the design thinking process has in common with the factors of creativity in that it can spread the possibility of resolving between the general theory and the reality which is already known by demanding a new one.

And Design Thinking enables creative activities to be experienced (Song, 2014). In addition, the solution for problem solving of the design thinking process and the process of prototype designing and experimentation do not allow the user to fear the repetition of trial and error, and it is also possible to experience the ‘creative confidence’ that overcomes the fear of failure (Kelly & Kelly, 2013).

METHOD

This experiment compared the change in creative thinking before and after 16 hours of intensive design thinking process with 38 adult learners aged 20 to 55.

Design thinking process was conducted by the G laboratory of H University and was conducted to develop creative and collaborative problem solving skills through understanding and improve basic knowledge of design thinking. A self-reporting type pre-test was conducted on the experimental group prior to the implementation of the training, and post-test on the assessment related to creative activities was conducted after the design thinking process to conduct an impact analysis and creative thinking. The post-test was conducted as a questionnaire study of self-reporting creative activities and focused on measuring learners ' experience by comparing analysis results with subjective questionnaire responses.

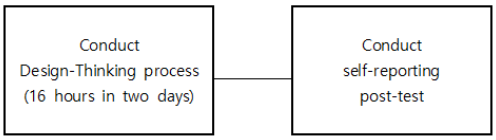

Figure 3. Research precess

RESULT

The results from the Design Thinking process effects through questionnaire are as follows.

First, I noticed that design thinking has a positive effect on changing the way adult learners' way of thinking. 14 out of 24 respondents (58 percent) answered that the level of empathy during the design thinking process had the greatest impact on changing the way of thinking and recognized the importance of empathy. 12 out of 24 respondents (50 %) answered that the idea creation step helped to derive and classify ideas for problem solving, while 9 (37 %) said problem definition step was important in the problem resolution process. Finally, 7 (29 %) said the change in mind-set was affected by the creating of prototypes to visualize ideas.

Second, it was able to see that design thinking workshops provide a variety of ideas for field application. About the field application of design thinking, 75 percent of respondents said they want to apply design thinking to their reading programs such as reading classes in the library. Other opinions have been wanting to apply it to one's daily life. Many participants said that creativity of individuals and familiarity with the design thinking process were needed to apply design thinking for library work.

Third, 38 % of learners who have been trained in design thinking said that design thinking will be applied in libraries to help children and teenagers develop creativity. Others said that while specifying and realizing problems through design thinking, they could improve their ability to solve problems by improving their ability to solve them.

CONCLUSION

The design thinking process seems to show positive effects on creative experiences. In particular, the experience of the design thinking process has been shown to have a positive impact on creative thinking in terms of change of thinking style and problem solving process. As a result of the study, problems occurring in a common result as reported in previous studies. And design thinking seems to be effective in in promoting creativity even in adult (Song, 2014; Seo 2017; Ku, 2017). The limitation of this study is a 16-hour intensive workshop in two days. Therefore, it is necessary to have sufficient time for design thinking workshop to experience and analyze various factors of creative thinking.

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