

Development of the ODCRE Cooking Teaching-Learning Model Using QR Code to Promote Creativity of 5-Year-Old Young Children

Hyoung-Jai Kim¹, Myung-Hee Kim², Min-Seo Song^{3*}

¹Department of Early childhood Education, UI University, Korea

²Department of Early childhood Education, Kyungsung University, Korea

^{3*}Department of Early childhood Education, Taegu Science University, Korea

*Corresponding author E-mail: song8778@tsu.ac.kr

Abstract

Background/Objectives: The purpose of this study is to develop an ODCRE teaching-learning model of a cooking program using QR codes for young children in order to promote children's creativity and to develop the program activity plans that reflect the ODCRE culinary teaching-learning model using QR code.

Methods/Statistical analysis: This study was developed through the following five stages: 1) diagnosing the necessity of the development of the culinary teaching-learning model, 2) understanding cooking classes, 3) establishing the basic direction of the culinary teaching-learning model, 4) developing the culinary teaching-learning model, and 5) completing the final culinary teaching-learning model.

Findings: The teaching-learning model of a cooking program was developed as an ODCRE teaching-learning model through the following steps: 1) Creatively searching cooking ingredients (understanding the concept of creative cooking, exploring various cooking materials, and understanding of creativity knowledge), 2) cooking recipe (understanding various cooking methods using the selected cooking materials and recipe development using smart phone and iPad), 3) cooking practice (creative cooking and envisioning ideas – photographing and recording their creative cooking activities and cooking procedures) 4) representing the cooking (representing their activities after the program, saving it as an experience, and creating QR codes for their own cooking recipes), 5) evaluation (creative cooking activity evaluation, cleaning up, cuisine tasting, creating cookbook using QR code and family-involved activities).

Improvements/Applications: The ODCRE culinary teaching-learning model using the QR code, developed in this study, was an effective model for improving the creativity of young children. In particular, the QR code adopted in the ODCRE culinary teaching-learning model developed in this study suggests that there is a great value in the field of young children education as a teaching and learning tool.

Keywords: *cooking teaching-learning model, cooking program, young children, QR code, creativity.*

1. Introduction

The fourth industrial revolution, which integrates information and communication technology (ICT), is a next-generation industrial revolution led by artificial intelligence, robotic technology and life sciences. As the astounding result of the Google DeepMind Challenge Match (AlphaGo versus Lee sedol) surprises the world, in academia, while they admit that advances in science and technology lead to the convenience of human life, they raise concerns about the machine-domination. Since state-of-the-art machines supported by artificial intelligence are equipped with logical, analytical and judgmental capabilities, the contemporary education field focuses on creativity education that promotes human-based creativity and integrative thinking ability. In order to cope with rapidly changing society in the Republic of Korea, the Korean educational system emphasizes problem-solving ability, and creative thinking ability to promote creative, interdisciplinary human resource training [1].

Particularly, creative imagination in infancy serves as the foundation of creativity when they become adults. Infancy is the time when the imagination reaches its peak, thus the educational effect can be maximized [2]. Since it is the most active time for creativity development, the development of young children's creativity should be focused [3]. Among various programs for creativity development in infancy, cooking activities require observation, curiosity, and problem-solving skills that lead to high-level thinking of young children. In addition, the cooking activity itself can reward young children and promote their integrative thinking. As a result of the creation of intangible creativity – how to cook, and a tangible outcome – the cuisine, it is an activity that young children feel responsibility and achievement. It is also a great activity for young children to learn nutritional knowledge and provides integrated educational values in various intellectual areas of young children [4]. Creative culinary programs developed in the Republic of Korea are as follows. Reference [5] indicated that through cooking activities, young children can develop rich imagination, creativity and

problem-solving ability by performing diverse and extended activities such as creative cooking, bakery role-playing and chef activities. Reference [6] indicated that the charm of cooking is created by new taste and form, completely transformed into a new state by physio-chemical changes and forces. Reference [6] delineates that with the same material, young children will have different creative outcomes when they change the way of cooking. As such, young children can participate in cooking directly, and cook with their own recipes to create a new way out of the existing cooking methods. Creativity is best demonstrated when motivated by the interests, pleasures, and satisfaction of oneself [5]. Therefore, it is effective not only in an educational aspect, but also in creativity development that young children develop cooking recipe and cook it by themselves.

In addition, in order to maximize the creativity effect, researches on the utilization of smart devices have been actively carried out to induce the interest of learners and to transmit effective learning data [7-9]. In reference [10], QR codes were used in mathematical subjects to induce interest of mathematical activities, and data and results were presented to introduce various learning methods. In reference [7], the use of QR codes in scientific activities has a positive effect on young children's scientific attitude and problem-solving ability. As such, the QR code naturally induces the interest of scholars when educational materials such as smart phones and

tablet PCs as various educational platforms are provided on top of existing educational materials. It is reported to be effective in learner's problem-solving, inducing their curiosity, and enhancing their creativity.

Therefore, in this study, after we analyzed the teaching-learning model from a proper cooking program to improve the creativity of 5-year-old young children, we aimed to develop the ODCRE teaching-learning model of a cooking program using QR code for young children. Then, we applied a program activity that reflects the ODCRE cooking teaching-learning model using QR code. The research questions to describe the purpose of this study are as follows. First, what is the ODCRE cooking teaching-learning model for young children's creativity? Second, what is the culinary program activity reflecting the ODCRE cooking teaching-learning model using QR code to promote young children's creativity?

2. Teaching and Learning Model Development Procedure

The developmental process of the ODCRE teaching-learning model for young children's creativity is shown in Figure 1.

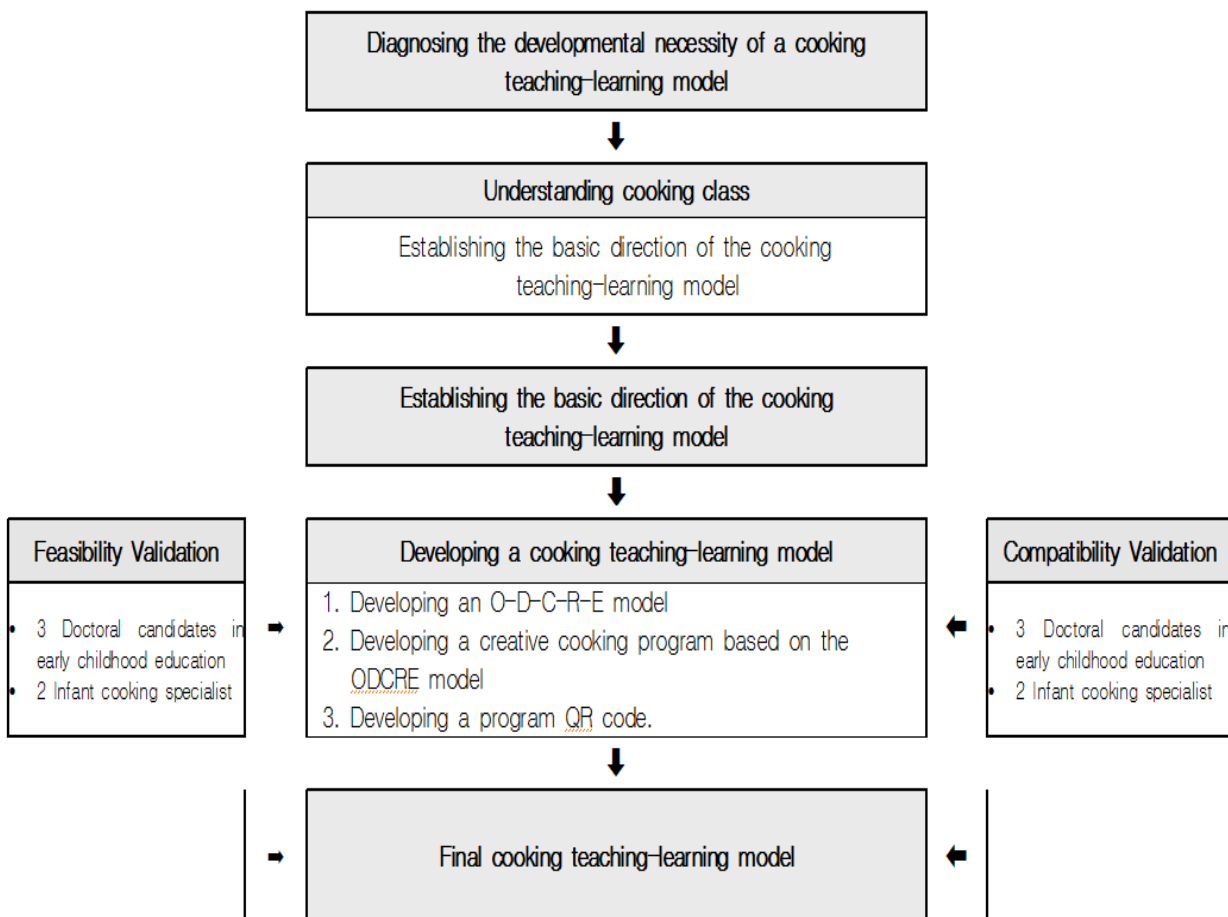


Figure 1: The developmental procedure of the ODCRE cooking teaching-learning model

As shown in Figure 1, the following steps were proposed –1) diagnosing the necessity of the development of a cooking teaching-learning model, 2) reviewing previous teaching-learning models to understand cooking classes, 3) establishing the basic direction of the cooking teaching-learning model, 4) developing a cooking teaching-learning model, and 5) completing the final cooking teaching-learning model by developing QR codes and

programs.

3. O-D-C-R-E Teaching Learning Model

The O-D-C-R-E teaching-learning model of the young children's cooking program is shown in Figure 2.

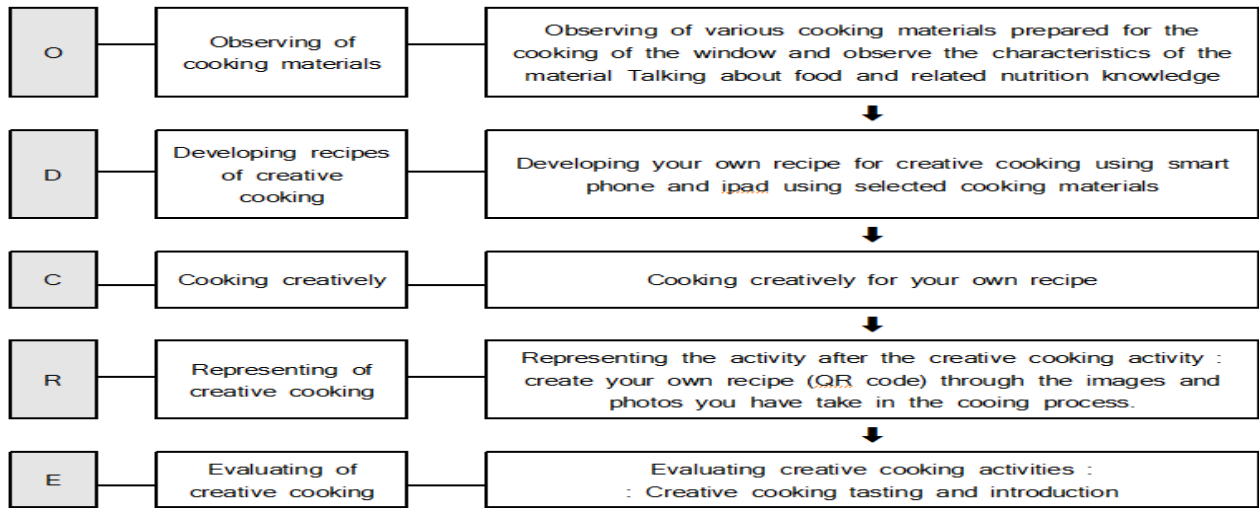


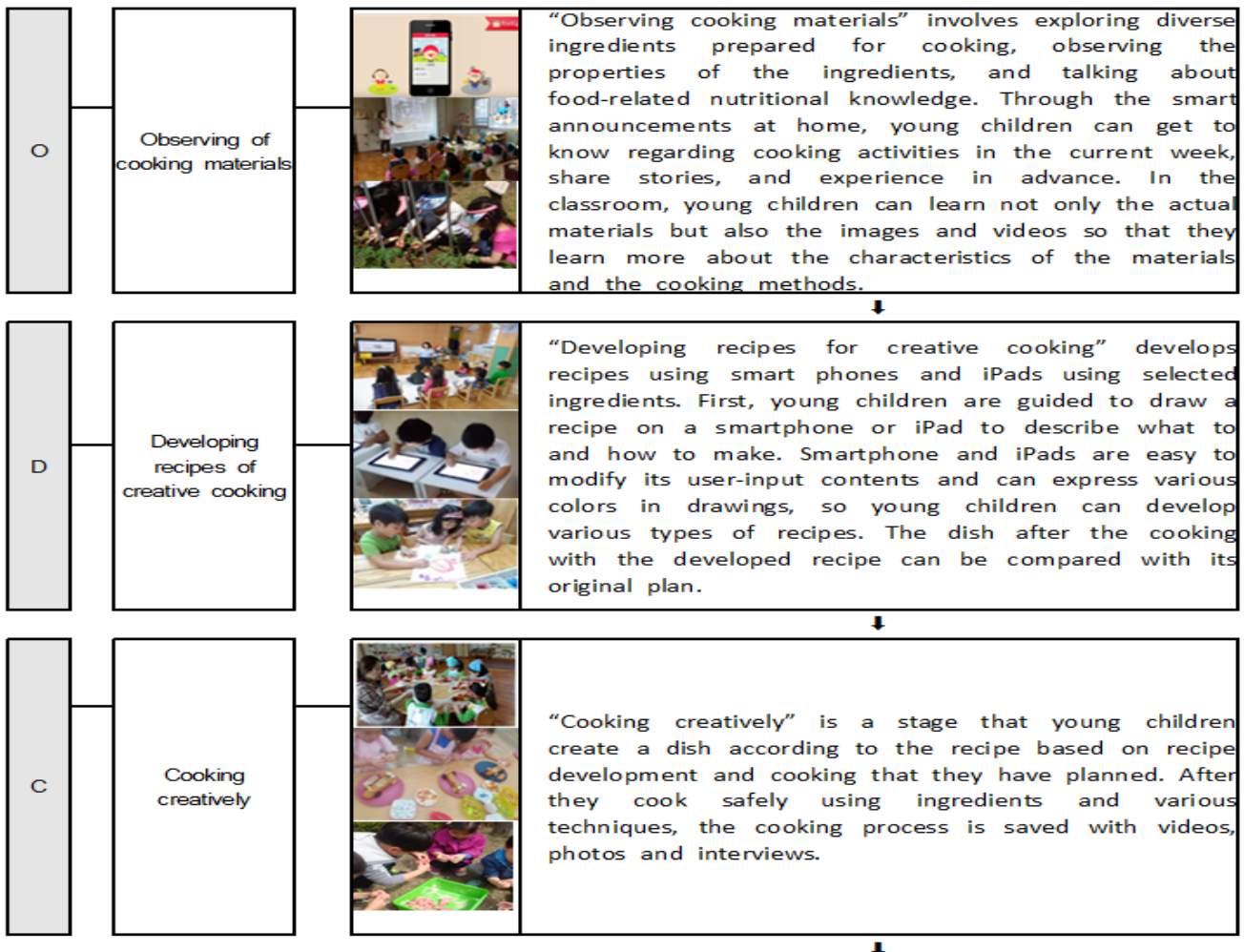
Figure 2: O-D-C-R-E teaching and learning model

As shown in Figure 2, the teaching-learning model of the cooking program was developed as an ODCRE teaching-learning model through the following steps: 1) creative cooking ingredients searching activity (understanding the concept of creative cooking, exploring various cooking materials, and understanding of creativity knowledge), 2) cooking recipe (understanding various cooking methods using selected cooking materials and developing recipes with smart phone and iPad), 3) cooking practice (cooking creatively and envisioning ideas – photographing and recording their creative cooking activities and cooking procedures) 4) representing the cooking (representing their activities after the

program, saving it as an experience, and creating QR codes for their own cooking recipes), 5) evaluation (creative cooking activity evaluation, cleaning up, cuisine tasting, creating cookbook using QR code and family-involved activities).

4. Activity Using the ODCRE Teaching-Learning Model

Figure 3 shows examples of specific activities using the ODCRE cooking teaching and learning model.



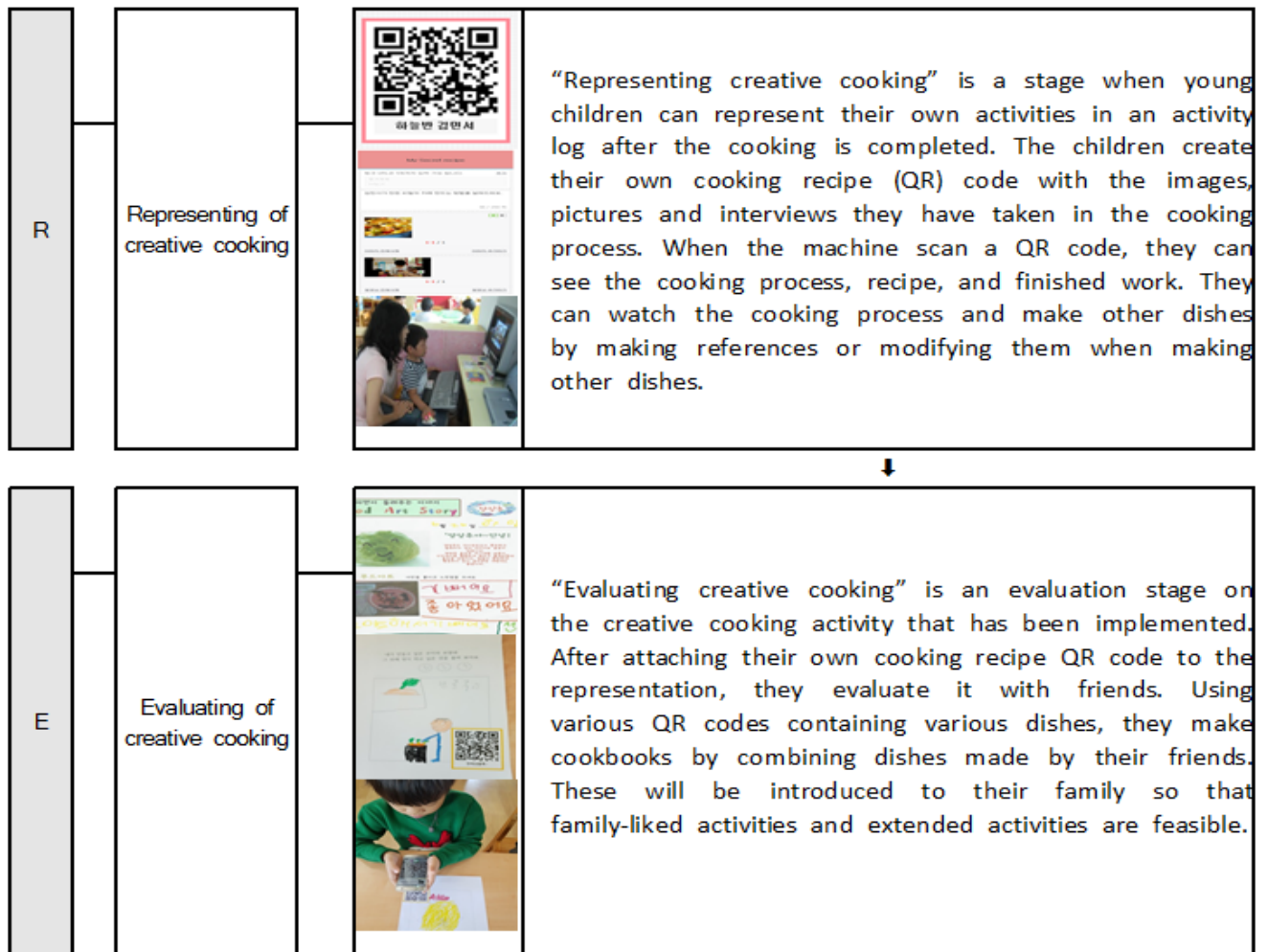


Figure 3.:Detailed activities using the ODCRE teaching-learning model

5. Conclusion

The purpose of this study is to develop an ODCRE cooking teaching-learning model utilizing QR code to improve the creativity of 5-year-old young children. In this regard, we developed a cooking program activity that utilizes the ODCRE culinary teaching-learning model. The ODCRE cooking teaching and learning model for young children’s creativity development was developed to go through the following stages: cooking material searching activity, cooking recipe, cooking practice, cooking representation and cooking evaluation.

A culinary activity that reflects the ODCRE cooking teaching-learning model did not follow the general cooking process that includes the ordinary cooking material searching activity and the routine cooking sequence, which mainly reflects in the early childhood education field. After exploring cooking materials thoroughly through their five senses, a creative class is given to young children so that they learned characteristics of ingredients. They were guided to decide what and how to make for a cooking recipe. In addition, this study provided an opportunity for young children to express their creativity through their experience representation of the things learned from the culinary activities after they implemented their own cooking recipe.

In addition, the ODCRE culinary activity using the QR code developed in this study included the process of making a cooking recipe QR code that contains photographs and interview videos taken during the cooking process. Additionally, this study provided diverse environments for young children’s creativity promotion, such as making a cookbook containing various cooking QR codes developed with their friends. Therefore, a class

was designed through the ODCRE’s five-stage culinary teaching-learning processes - not only to improve young children’s creativity, but also to improve their problem-solving ability and the integrative thinking ability required for future human resources in the era of the fourth industrial revolution.

The limitations of this study are as follows: First, this study developed an example of a cooking program activity that reflects the ODCRE cooking teaching and learning model using QR code. In the following study, it is crucial to develop yearly systematic program activity that reflects the ODCRE cooking teaching-learning model using QR code. Second, it is necessary to perform quantitative and qualitative analysis on the effect of young children’s creativity beyond the application examples regarding the cooking program presented in this study. In addition, subsequent research should be carried out in order to identify problem-solving ability and integrative thinking ability regarding relevant variables including nutritional knowledge and eating habits, which can verify the effects of the cooking program as well as creativity as a subordinate variable.

The future is a time that requires integration and creativity. In addition to the intellectual ability, the ability to select relevant knowledge, apply it to the relevant circumstances, and utilize it wisely is absolutely required. In terms of the academic utilization of the results of this study, this study will contribute not only to the interdisciplinary convergence of early childhood education, but also to the development of curricula and programs utilizing the creativity required in the modern era. In addition, the convergent teaching-learning model developed in this study suggests that a class model can help young children develop problem-solving ability and creativity through activities led by themselves and voluntarily search, develop, execute and represent.

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