# A Pilot Study On Developing A Mobile Application To Enhance Teachers' Creative Teaching Competence[1]

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| ARTICLE INFO | ABSTRACT |
|---|---|
| | This study aimed to develop a mobile application called the Creative Teaching Creative Teacher app (CTCT app) for early childhood teachers to monitor and improve their creative teaching competence. Semi-structured interviews were conducted with 10 early childhood teachers and 3 experts to determine the demand for developing creative teaching applications. The interviews focused on the expected contents, design, and function of the CTCT app. The app's design and functionality underwent revisions through ongoing meetings with the developer. The CTCT app consists of four menus: 'Creative Teaching Competence Checklist', 'Strengths and Weaknesses on Creative Teaching Competence', 'Expert Q&A on Creative Teaching Competence', and 'Sharing Creative Teaching'. The CTCT app can monitor early childhood teachers' creative teaching competence and allow them to share their creative teaching cases with others. The CTCT application may assist early childhood educators in enhancing their capacity to foster children's creativity and boost their confidence in creative instruction. |
| | **Keywords:** Creative teaching competence, early childhood teachers, mobile app |

## I.  INTRODUCTION

In the era of the Fourth Industrial Revolution, there is a growing societal demand for nurturing children's creativity as a future competency; In this rapidly evolving landscape, individuals who cultivate their creative abilities are better equipped to navigate uncertainty, embrace change, and thrive in the digital age. Particularly, the 2019 revised Nuri curriculum (Kindergarten curriculum) in Korea reinstates the importance of fostering young children's creativity. Children's creativity correlates closely with their divergent thinking skills and high problem-solving abilities [1]. Additionally, children's creative thinking contributes to positive emotions and emotional comprehension [2-4]. These findings suggest that the groundwork for subsequent adult creativity development lies in childhood creativity [5]. Such insights underscore the need to encourage children's creativity to facilitate their healthy development and adaptability.

However, with the increasing number of working families in South Korea, infants and toddlers have been attending daycare centers at an increasingly early age in recent years. This implies that they spend more time than ever before with their teachers at these facilities, leading to a notable shift in the educators' role in young children's development. Consequently, early childhood teachers must enhance their creative teaching competence to support young children's creativity. Teachers should create a physical and psychological setting that enables young children to explore new ideas, observe differences from the past, and engage in questioning during their daily play.

Nevertheless, early childhood teachers in the field often lack education related to creativity [6-7]. This deficiency can hinder the implementation of early childhood creativity education and creative teaching. Particularly, the enforcement of the 2019 revised Nuri curriculum in early childhood education has granted early childhood teachers increased autonomy in classroom management. This has heightened the interest and significance of early childhood teachers' creative teaching methods and teaching skills. While early childhood educators acknowledge the importance of creativity education for young children, they encounter difficulties

in identifying appropriate methods for fostering creativity in young children. Since teacher creativity and creative teaching are closely related to the development of children's creativity [8-9], efforts are needed to enhance the teacher's creative teaching ability. Consequently, those engaged in early childhood education should be encouraged to reflect on and enhance their creative teaching competence regularly and continuously. Creative teaching competencies encompass the knowledge, attitudes, and skills [10-11] that early childhood educators need to support young children's creative development. Kim [12] developed a creative teaching competency scale by extracting constructs and items suitable for the Korean educational context based on previously developed creative teaching scales [13-18]. Early childhood teachers' creative teaching competence comprises five factors: supporting a creative environment for the child, understanding early childhood creativity development, using creative teaching methods, making efforts to develop teachers' creativity, and evaluating creativity [12]. Consequently, the concept of creative teaching encompasses a multifaceted array of elements, including educators' comprehension of creativity, their dedication to and attitudes towards fostering young children's creativity, their pedagogical practices and interactions to encourage young children's creativity, and their assessment. Therefore, comprehending and monitoring teachers' strengths and weaknesses in creative teaching competencies are crucial to provide effective support for young children's creativity.

Presently, early childhood educators are primarily Millennials, ranging from their twenties to early forties, well-versed in the use of mobile and information technology [19]. They frequently utilize digital devices and online content to access educational information related to their profession. Particularly since the COVID-19 pandemic, with the transition to emergency care and the ongoing contactless situation, early childhood educators have increased their use of mobile phones for communication and teaching purposes. Mobile phones are also useful tools for monitoring daily behavior and changes; thus, a mobile app could provide a sustainable way to enhance self-monitoring of creative teaching competence.

Therefore, this study aims to develop a mobile application called the Creative Teaching Creative Teacher app (CTCT app) for early childhood teachers to monitor and improve their creative teaching competence.

## II. METHODS

### A. Participants

Semi-structured interviews were conducted with 10 teachers of children aged 3-5 years to find out the need for the development of creative applications to improve teaching skills. Before conducting the interviews, the teachers were informed about the purpose of the study, the content of the interviews, and the time of the interviews. Those teachers who agreed to participate in the interviews were interviewed. A snowball sampling method was used to obtain interview participants. The snowball sampling method is a non-probability sampling method. This interview should be composed of people who have some interest in creative teaching, so this method was used.

These teachers worked in kindergartens or daycare centers in Seoul, Gyeonggi, and Busan. The teachers' experience was at least 7 years and up to 24 years. The age range of the teachers was 1 in their 20s, 8 in their 30s, and 1 in their 40s. The teachers had at least a four-year college degree, and some had master's and doctoral degrees.

### B. Measurement

The focus group interviews were conducted using a semi-structured questionnaire on functional and content aspects of the creative teaching competence app. Three experts in the fields of early childhood education and creativity conducted a review of the questionnaire to determine its content validity.

The "content in the Creative Teaching app" category includes the following content aspects: self-assessment and interpretation of creative teaching competencies of early childhood teachers; types of creative teaching competencies of early childhood teachers; and so on. In addition, the following elements are included: creative teaching competency quizzes, creative teaching competency sharing, Q&A on desirable creative teaching competencies, and so forth.

The second category, "Features in the Creative Teaching app," encompasses functional aspects that facilitate the use of the app to be developed. These include motivation, interaction, ease of progress and stability, accessibility of menus and buttons, and aesthetics of design.

### C. Procedure and Data analysis

A total of ten early childhood teachers were recruited to ascertain the demand for the development of creative teaching competency apps. In consideration of the teachers' schedules, a Focus group interview (FGI) was conducted by dividing the participants into two groups of five individuals each. Following the consent of the early childhood teachers to participate in the interview, a semi-structured questionnaire was distributed before the interview. The interviews were conducted non-face-to-face using Zoom. The early childhood teachers were encouraged to contribute freely to the development of the creative teaching competency app by proposing content and functionalities that they deemed appropriate for inclusion. The interview time was approximately 1 hour and 10 minutes to 20 minutes for each team.

The responses of the teachers were recorded, and all of the recorded contents were transcribed. Based on the

responses of the teachers, the content or functions were re-categorized based on keywords to derive content or functions to consider when developing a creative teaching competency app. Subsequently, the draft creative teaching competency app was subjected to a review by three experts in creativity and early childhood education to ascertain its suitability.

## III. RESULTS

### A. Analysis of Early Childhood Teachers' Demand for Creative Teaching Competency App Development

The Creative Teaching Competence app was designed with input from early childhood teachers. The results of in-depth interviews with early childhood teachers on the demand for creative teaching promotion apps are summarized as follows. Early childhood teachers identified four main content areas for inclusion in the app (see Table 1). These were: the ability to self-assess creative teaching skills; learning about strengths and weaknesses based on a creative teaching competence score; sharing creative teaching practices with colleagues; and seeking advice about creative teaching from experts.

**<Table 1>** Early Childhood Teachers' Demand for Creative Teaching Competence App Development

| Contents area | Responses |
|---|---|
| assessment and interpretation of creative teaching capabilities of early childhood teachers | *"Nowadays, teachers use their mobile phones to find play materials and communicate with parents, so I think it would be meaningful to check their creative teaching skills using their mobile phones. If I know what I am good at and what I am not good at in terms of creative teaching, I will pay more attention to it."* <br> *"Recently, people have been using online MBTI tests to identify personality types. Like that, it would be nice if I could see if I was teaching creatively in class with young children through my mobile phone"* <br> *"I'd like to be able to see the details of where I'm strong and where I'm weak, not just where I'm high or low, and if it's an app that monitors my creative teaching skills,"* <br> *"I'd like to be able to see my scores from the last time I took it so I can compare them to my current scores, so I can see how I'm improving."* |
| My Creative Teaching Competence Strengths and Weaknesses | *"It would be great if the Creative Teaching Competence app could not only interpret a teacher's creative teaching competence profile but also share tips on how to improve their weak areas."* <br> *"I am seeking feedback on my effectiveness in utilizing creative teaching methods to foster creativity in my child. I would like to understand my strengths and areas for improvement in this regard."* <br> *"I want to know an objective assessment of my creative teaching abilities relative to my colleagues'. Specifically, I wish to ascertain whether my teaching style is perceived as creative, whether I possess an in-depth understanding of children's creativity, and whether I have a solid grasp of creative thinking techniques."* |
| sharing creative teaching practices with colleagues | *"I think it would be great if there was an area for teachers to upload examples of creative teaching or play with children to the app and reward teachers who share a lot of ideas."* <br> *"When I search for information on creative teaching, I often see articles on Kkomangsae, KidKids, etc., but it's more useful to have teachers post their articles. It would be great to see more examples of teachers' creative teaching activities and play in the Creative Teaching app."* <br> *"I am interested in learning more about how other teachers are fostering creativity in their toddlers while implementing a play-based curriculum. I would appreciate insights on how other teachers engage in creative play with their young children."* |
| Seeking advice about creative teaching from experts. | *"It would be nice to see a very short video of an expert explaining creativity in an area of the app where you can exchange questions and answers related to creative teaching from experts."* <br> *"I am seeking the opinion of an expert on the efficacy of the creative activities I am undertaking to enhance my young children's creativity."* |

Regarding the user interface of the Creative Teaching Skills app, there was a consensus that the design should be clear and concise and that the icons should be appealing and vibrant, reflecting the characteristics of early childhood teachers. To share creative teaching and creative play examples, they desired to establish an online platform that was linked to the app, enabling the upload of photos or videos.

### B. Creative Teaching Competency App implementation
#### 1. Smartphone Launch Screen
The UI created on the smartphone is in the form of a "CTCT" button as shown below, and when you touch the button, you will be taken to a screen that measures the creative teaching competence of early childhood teachers. When you press the "Creative Teaching Competence Checklist" button, you can go to the screen and check your creative teaching competence score in a chart (see Figure 1-2).

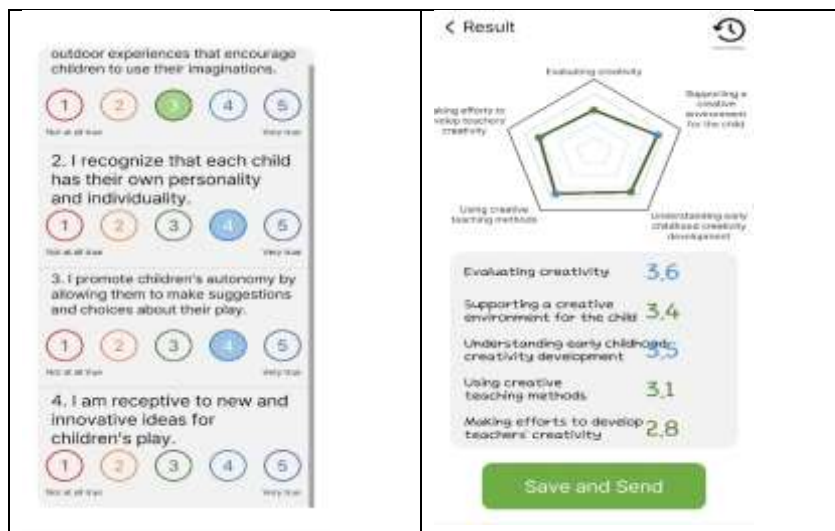**Figure 1.** Icon and main display



**Figure 2.** Creative Teaching Competence Checklist and its Interpretation

2. Click the "Strengths and Weaknesses on Creative Teaching Competence" button to see your score on each of the five subscales and what your score means. If a teacher's score is low, "How to Improve Creative Teaching" is provided (see Figure 3).
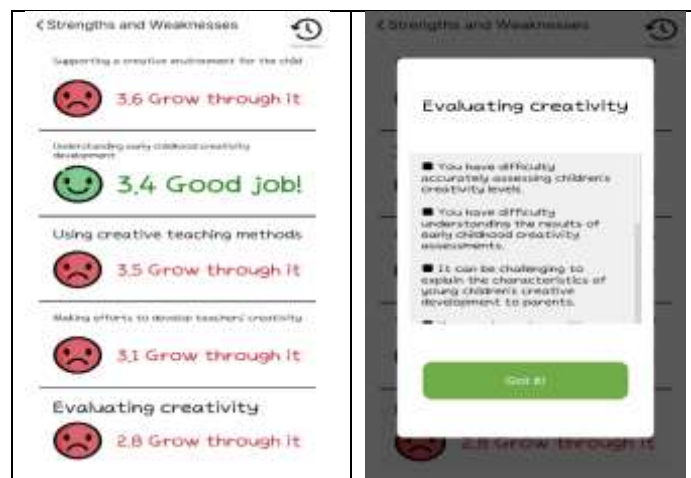


**Figure 3.** Strengths and Weaknesses of Creative Teaching Competence

3. Click on the 'Expert Q&A on Creative Teaching Competence' button to take a quiz on creative thinking. After taking the quiz, click the 'I want to know more' button to be connected to the online platform (CTCT cafe) (see Figure 4). The online platform (CTCT cafe) provides activities to promote creative thinking in young children.

4. Click on the 'Sharing Creative Teaching' button to go to the online platform (CTCT cafe). There are examples of creative teaching and creative play that early childhood teachers have done with their children (see Figure 4).
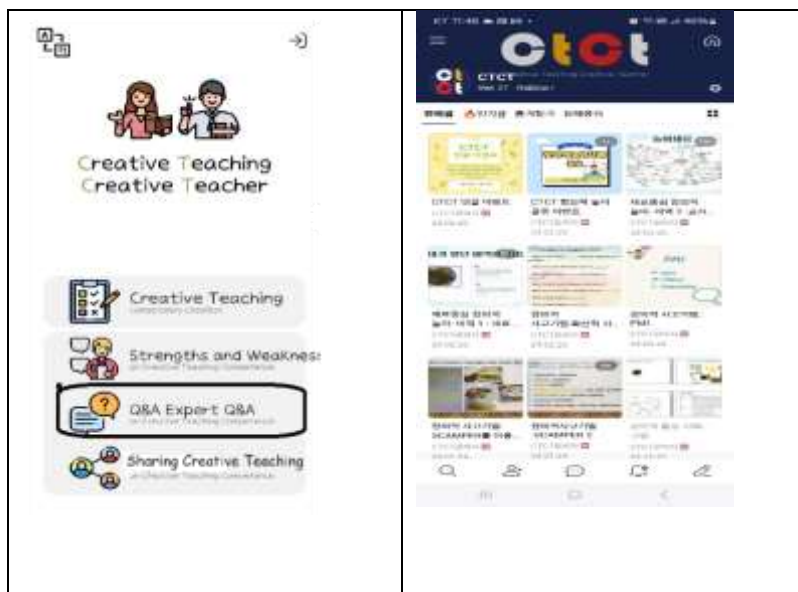


**Figure 4.** Expert Q & A and Sharing Creative Teaching (CTCT café-online platfrom)

## IV. CONCLUSION

This study aimed to develop a mobile application called the Creative Teaching Creative Teacher (CTCT) app for early childhood teachers to monitor and improve their creative teaching competence. The CTCT app offers early childhood teachers the opportunity to assess and reflect on their creative teaching practices and interactions with young children. Specifically, it enables teachers to re-evaluate their attitudes and behaviors to promote creativity in their daily practice and to reflect on the value of creativity and creativity education. This aligns with the demand for early childhood teachers to self-monitor their creative teaching competencies. Early childhood teachers assume the role of educators who continuously monitor their behavior and consider ways to improve it, rather than merely measuring their creative teaching competence. Considering that reflective teaching processes can lead to changes in teaching behaviors (Kwak & Park, 2004), the app developed in this study is expected to facilitate the improvement of teaching behaviors among early childhood teachers.

Previous studies have shown that teachers' creative teaching is closely related to the development of children's creativity (Dominey, 2021; Makris, Welch, & Himonides, 2021). Therefore, the CTCT app developed in this study is ultimately expected to help promote children's creativity. Additionally, the app could serve as a tool in teacher training programs within professional development organizations. From this perspective, the CTCT app can contribute to increasing teachers' creative teaching competence and efficacy, thereby fostering creativity in young children.

Furthermore, it would be beneficial to conduct longitudinal studies to assess the impact of using this app on teachers' creative teaching practices and students' creativity over time. This app also has the advantage of tracking changes in early childhood teachers' creative teaching competency over time compared to their initial levels. There is potential to expand the app's use beyond early childhood education to include primary and secondary education, with necessary adaptations. However, it is recommended that efforts be made to enhance the functionality and relevance of the CTCT app through continuous user feedback.

In conclusion, the CTCT app developed in this study is expected to play a significant role in enhancing teachers' teaching abilities and ultimately fostering creativity in young children.

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