

# **The Serial Multiple Mediating Effects of Play Teaching Efficacy and Play Support Competence on the Relationship between Early Childhood Teachers' Teaching Creativity and Teacher–Child Interactions**

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## **Abstract**

This study aimed to examine the serial multiple mediating effects of play teaching efficacy and support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. A survey was conducted among 333 early childhood teachers working in Seoul and Gyeonggi-do, South Korea. Data were analyzed using PROCESS macro (Model=6). Results revealed the following points. First, play teaching efficacy and play support competence fully mediated the relationship between early childhood teachers' teaching creativity and teacher–child interactions. Second, play teaching efficacy and play support competence had serial multiple mediating effects on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. These findings provide a basis for improving the quality of early childhood teachers' teaching creativity, teacher-child interactions, play teaching efficacy, and play support competence, which may have meaningful practical implications for the implementation of the 2019 revised Nuri curriculum of Korea.

**Keywords** : teaching creativity, teacher–child interactions, play teaching efficacy, play support competence

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## Introduction

Rapid socioeconomic changes in modern society have led to a rise in the number of working couples, thereby shifting the responsibility of raising children from the family to the national level. Consequently, an increasing number of children are attending educational institutions, such as daycare centers and kindergartens, and the enrollment rate for South Korean children aged 3–5 years was expected to reach 94.5% by 2022 (Statistics Korea, 2022). As a rising number of children begin their educational experiences at an early age, teachers play vital roles in the lives of children (Park & Sohn, 2021). In particular, early childhood education emphasizes the importance of teachers over the physical environment of educational institutions (Baek, 2011), and teacher–child interactions are factors that determine the quality of education (Egert et al., 2020; Park et al., 2021) and have a significant impact on children's development (Hu et al., 2019).

Teacher–child interactions refer to the communication between teachers and children during the teaching and learning process (Byun, 2017). Positive teacher-child interactions are associated with improved language development (Burchinal et al., 2008; Hamre et al., 2014; Yang et al., 2021), communication skills (Kim & Kim, 2019; Røe-Indregård et al., 2024), and self-regulation (Salminen et al., 2021; Seong & Moon, 2019). It also increases prosocial behavior (Burchinal et al., 2008; Kwon & Lee, 2017), decreases problem behavior (Bulotsky-Shearer et al., 2020), and positively impacts character development (Go, 2019). These studies demonstrate that teacher–child interaction is an important factor in the holistic development of children.

The 2019 Revised Nuri Curriculum, recently revised in Korea, further emphasizes the importance of teacher-child interactions for appropriate teacher response and support to meet the individuality and needs of the child (Yoo & Hwang, 2023). The 2019 Revised Nuri Curriculum is a common national curriculum for children aged 3-5 that is play-based and child-led, rather than teacher-led (Ministry of Education & Ministry of Health and Welfare, 2019). As a result, research has been conducted to determine which variables influence teacher-child interactions, and key variables have been identified as teaching creativity (Byun, 2019; Kang & Paik, 2013), play teaching efficacy (Kim & Lee, 2021), and play support competence (Kim, 2022).

As time demands creative and convergent human resource skills, the importance of teachers' creative teaching skills has been emphasized in early childhood education along with curricula that nurture children's creativity (Lee & An, 2020). Since children are open-minded and explore their surroundings through imagination (Kim, 2000), it is necessary for teachers to creatively manage the teaching–learning process with flexible thinking to realize children's potential (Kaufman, 2009; Paek & Sumners, 2019).

Teaching creativity refers to the teaching behavior of understanding, analyzing, and supporting play based on teachers' cognitive and personality factors (Paik & Kim, 2008) in improvised and novel play situations involving children with diverse characteristics. Teachers with higher levels of creativity are more likely to use diffuse thinking when supporting play to stimulate children's curiosity and motivation (Kang & Paik, 2013) and have more positive interactions with children (Byun, 2019). Teaching creativity has also been shown to have a positive effect on play teaching efficacy (Lee & Kim, 2022) and play support competence (Yim, 2021).

Another variable that influences teacher–child interactions is play teaching efficacy. It refers to teachers' beliefs about their ability to positively influence children's play (Shin, 2000). Play teaching efficacy leads teachers to believe that support in play situations will have a positive effect on children and motivates them to try appropriate teaching methods and interactions (Yu et al., 2022). Teachers with higher levels of play teaching efficacy are more likely to support children's play and have more positive teacher–child interactions (Kim & Lee, 2021). Furthermore, play teaching efficacy has a positive effect on play support competence; the higher the play teaching efficacy, the higher the play support competence (Yim, 2021).

In addition to play teaching efficacy, play support competence is predicted to influence teacher–child interactions. Recently, the role and competence of teachers in implementing child-centered play has been redefined. As an expert in children's play, teachers are expected to understand the value and meaning of play and provide contextualized educational support (Ministry of Education, Ministry of Health and Welfare, 2019). Previous studies have highlighted the importance of teachers' competence in implementing play-centered curricula (Cheung et al., 2022; Keung & Cheung, 2019), with "play support" being a particularly necessary component (Cho, 2020; You et al., 2020).

Play support competence is a multidimensional concept that encompasses the cognitive, affective, and behavioral dimensions that teachers need to develop to effectively support children's play and provide appropriate physical and emotional support for spontaneous play (Kim, 2021). Teachers with higher play support competencies have a greater tendency to be prepared to support play, feel more confident in their ability to guide children's development through play support (Yim, 2021), and report a higher number of positive interactions with children (Kim, 2022).

Previous studies suggest that early childhood teachers' teaching creativity has a direct impact on teacher-child interactions. Additionally, play teaching efficacy and play support competence may mediate the relationship between these two variables. In addition, it is possible to predict the pathways through which play teaching efficacy and play support competence sequentially mediate the relationship between teaching creativity and teacher-child interactions. Thus, the purpose of this study was to examine the serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher-child interactions. The findings of the study may have practical implications for the implementation of child- and play-centered curricula, especially when emphasizing the significance of teacher-child interactions and teachers' play competence, as highlighted in the 2019 Revised Nuri Curriculum.

## **Literature Review**

### **Teacher–child interactions**

Teacher–child interactions refer to the communication between teachers and children during the teaching and learning process (Byun, 2017). It includes not only verbal aspects but also nonverbal interaction, such as eye contact, gestures, facial expressions, and behaviors, and various aspects, such as emotional support (Lee & Kim, 2021). Lee (2003) classified teacher–child interaction into emotional, verbal, and behavioral interactions.

Children acquire knowledge and skills and form attitudes through their interactions with teachers (Chung et al., 2016). Close interactions with adults in early childhood help develop children's autonomy, self-regulation, and language skills (Thomason & La Paro, 2009). Teachers' responsive and supportive interactions foster positive relationships with children and aid in expanding their play (Seo, 2019). In early childhood education, teacher–child interactions are a crucial component of the teaching–learning process (Baek, 2011) and is the most important factor in determining the quality of education (Egert et al., 2020; Park et al., 2021).

Kim (2014) believed that teachers' sensitive and appropriate responses can optimize children's development. Lee (2021) emphasized that smooth interactions promote children's development and play. The importance of teacher–child interactions has been further emphasized by the recent curriculum revision to a child- and play-centered curriculum in South Korea (Yoo & Hwang, 2023). Teachers need to have high-quality interaction skills to identify children's intentions in the play process, maintain their interest, and enable them to have a variety of experiences (Woo, 2021). In this study, teacher–child interaction refers to the communication between teachers and children during the teaching–learning process (Byun, 2017), which includes emotional, verbal, and behavioral interactions (Lee, 2003).

### **Teaching creativity**

Since it has been argued that creativity is a universal ability that is latent in everyone rather than an ability to excel in a specific area, it is seen as a concept that comprises multidimensional cognitive, definitional, and environmental factors rather than a single factor (Amabile, 1983). Cropley (2001) revealed that creative outcomes are produced in all areas of an individual's existence, and from this perspective, the teaching process of early childhood teachers can be considered as a creative outcome of the teacher (Paik & Kim, 2008).

Kaufman (2009) stated that creative teaching behavior is the teaching behavior of teachers who creatively operate the teaching–learning process to develop the potential of children. Early childhood is a crucial period for the acquisition of creativity, and it is essential for early childhood teachers to plan activities suitable for the development of creativity and lead

students in an interesting and meaningful way (Kim & Lee, 2022). In particular, early childhood teachers must have the ability to be creative and adapt their teaching methods to the situation because they meet children with different characteristics and encounter new problem situations every day (Paik, 2006).

Teachers' high levels of teaching creativity have a substantial impact on the quality of play by creating an environment that allows for free-flowing, child-directed play and encourages new play (Park & Im, 2023). In addition, such teachers may be able to support children's play and learning more positively when implementing play-centered curricula (Kwon & Kim, 2022). This suggests that early childhood teachers' teaching creativity should be fostered to stimulate children's interest and allow for creative expression of play (Lee et al., 2022). Urban (1990) proposed the components model of creativity, which has cognitive (i.e., divergent thinking and acting, general knowledge and thinking base, and specific knowledge base and area specific skills) and personality (i.e., focusing and task commitment, motivation and motives, and openness and tolerance of ambiguity) components. Based on Urban's (1990) components model of creativity, Cropley (2001) presented strategies for fostering creativity in the classroom. Paik and Kim (2008) applied these ideas to the development of a test to measure creativity in early childhood teachers. In this study, teaching creativity refers to teaching behaviors that understand, analyze, and support play based on teachers' cognitive and personality factors (Paik & Kim, 2008).

### **Play teaching efficacy**

Play teaching efficacy applies teaching efficacy to play and refers to teachers' beliefs about their ability to positively influence children's play (Shin, 2000; Shin et al., 2004). It refers to the beliefs and attitudes that enable teachers to understand the educational value of play, plan teaching strategies, and internalize confidence in their play teaching abilities (Ko, 2021). Shin et al. (2004) categorized play teaching efficacy into beliefs about play teaching efficacy and expectations about play teaching outcomes.

Teachers with high play teaching efficacy are more likely to create environments that extend children's play, provide appropriate interventions and support in play situations (Kim & Park, 2015), and have more positive teacher-child interactions (Kim & Lee, 2021). They

tend to engage in interactions that encourage and extend children's play whereas teachers with low play teaching efficacy may engage in interactions, such as teaching methods and control commands, that discourage and avoid children's play (Shin, 2000). When teachers have a sense of play teaching efficacy, which is the expectation that their teaching behaviors will support children's development and growth, they attempt to use appropriate teaching strategies and interactions to ensure that children feel fulfilled through play and that meaningful play occurs (Yu et al., 2022).

In particular, with the revision of the play-centered curriculum, early childhood teachers are required to have a high sense of play teaching efficacy to recognize their role as teachers based on a sufficient understanding of the values, perspectives, and outcomes of play and to support children's play (Kim, 2021). When teachers have positive beliefs about their teaching behaviors and roles as well as confidence in their ability to influence children, they tend to have a positive impact on the implementation of a play-centered curriculum (Yu et al., 2022).

### **Play support competence**

Play is a natural way of life for children and a highly fulfilling activity involving pleasure, fun, spontaneity, and learning (Ko, 2021). It is an important tool in early childhood education as it helps promote the holistic development of children's cognitive, social, emotional, and physical development (Wong et al., 2011). Recently, there has been a paradigm shift in early childhood education toward a child- and play-centered curriculum that emphasizes children's ability to solve their problems through spontaneous and self-directed play and to learn naturally in the process (Ministry of Education, Ministry of Health and Welfare, 2019).

Many studies have emphasized the importance of teacher competencies in implementing play-centered curricula (Cheung et al., 2022; Keung & Cheung, 2019), with "play support" being a particularly necessary teacher competency (Cho, 2020; You et al., 2020). Teachers need to have specialized knowledge and skills related to play support to effectively support children's play (Kim et al., 2022). Play support competence refers to providing appropriate physical and emotional support for children's spontaneous and self-directed play (Kim, 2021). It has a direct impact on children's play and is closely related to their development (Yim, 2021). Cho (2020) recognized this as a clear awareness and understanding, methods, or skills

for dealing with play and attitudes or dispositions toward play situations that teachers need to develop to effectively support children's play. Kim (2021) presented this concept as a multidimensional factor that includes the cognitive, affective, and behavioral dimensions that teachers need to effectively support children's play.

Teachers with higher play support competence are more confident in their ability to guide children's development through play (Yim, 2021) and have more positive interactions with them (Yoo & Hwang, 2023). In this study, play support competence encompasses the cognitive, affective, and behavioral dimensions that teachers need to effectively support children's play and provide appropriate physical and emotional support (Kim, 2021).

### **Relationships among variables**

The relationships among teaching creativity, teacher–child interactions, play teaching efficacy, and play support competence are as follows.

First, there is a relationship between teaching creativity and teacher–child interactions. Kang and Paik (2013) found that teachers with high teaching creativity had interactions that encouraged children to be curious in problem-solving. In a study of daycare center teachers, Lee (2013) found that teaching creativity positively influenced teacher–child interactions, and the higher the teacher's teaching creativity, the more active the teacher–child interactions, which promoted children's thinking and activities. Byun (2019) pointed out that cognitive factors were more influential among the sub-factors of creativity and that cognitive creativity played a more important role in teacher–child interactions.

Second, there is a relationship between teaching creativity and play teaching efficacy. Park (2021) reported that teaching creativity has a significant effect on play teaching efficacy; the higher the teacher's ability to think diffusely, elaborate ideas, and try new things in class, the higher the play teaching efficacy. In addition, a study by Lee (2021) confirmed that teaching creativity has a significant effect on play teaching efficacy. Lee and Kim (2022) found that the cognitive factors of teaching creativity have the greatest influence on play teaching efficacy.

Third, there is a relationship between play teaching efficacy and teacher–child interactions. In Shin's (2000) study, teachers with high play teaching efficacy had higher levels of positive

interactions that encouraged, sustained, and extended children's play. This suggests that teachers with high efficacy toward play have positive beliefs and expectations about their teaching behaviors and have interactions that support and encourage play. In a study of daycare teachers, Kim and Lee (2021) found that play teaching efficacy directly influenced teacher–child interactions. Park et al. (2021) revealed that when early childhood teachers have clear beliefs about play, interactions are more likely to be appropriate and positive based on children's individual play characteristics.

Fourth, there is a relationship between teaching creativity and play support competence. Yim (2021) found that early childhood teachers' creativity positively affected their play support competence. This is consistent with the findings of Fang et al. (2022), who found that teachers with higher levels of teaching creativity were more likely to implement a play-centered curriculum by providing appropriate materials for the play process and reorganizing the space to suit the play situation. Paik (2022) suggested that teachers with high levels of creativity should carefully observe children's play and flexibly support it through diffuse thinking. Park and Im (2023) found that teachers with high levels of creativity constantly strive to plan and implement new play and support child-directed play.

Fifth, there is a relationship between play support competence and teacher–child interactions. Kim (2022) found that play support competence has a static effect on teacher–child interactions. Teachers with high play support competence have positive and active interactions. Therefore, they should continuously improve their play support competence. Fang et al. (2022) reported that play support competence has a direct effect on teacher–child interactions. Yoo and Hwang (2023) found that the higher the teacher's ability to understand the value of play required by a play-centered curriculum, the better the teacher–child interactions.

Finally, there is a relationship between play teaching efficacy and play support competence. Yim (2022) found that play teaching efficacy had a significant effect on play support competence, meaning that the higher the play teaching efficacy of early childhood teachers, the higher their play support competence. In a study of kindergarten teachers, Han (2022) found that the higher the teachers' play efficacy beliefs, which are competence and confidence in play, the more positively they respond to children's play and provide effective support. Park and Chung (2022) suggested that play teaching efficacy has a significant effect on play

support competence, which means that the higher the play teaching efficacy of early childhood teachers, the higher their play support competence.

Based on the above studies, this study aimed to examine the mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. In addition, this study investigated the serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. The research model is illustrated in Figure 1.

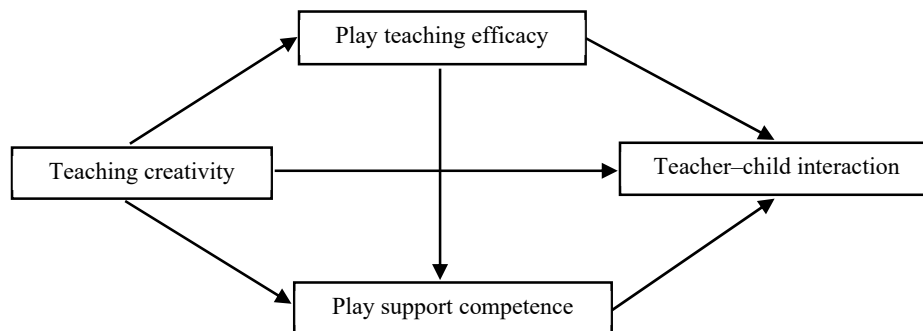


Figure 1. The Research Model

## Methods

### Research samples and data collection

Participants were 330 early childhood teachers in Seoul and Gyeonggi-do, Korea. Data were collected from January 23 to February 10, 2023 using a self-reported questionnaire survey. Among the participants, teaching experience was less than 5 years (46.4%), 5 ~ 10 years (31.2%), 10 ~ 15 years (17.0%), and more than 15 years (5.5%), and the type of workplace included daycare centers (72.3%) and kindergartens (27.6%).

## Research instruments

### *Teaching creativity*

To measure early childhood teachers' teaching creativity, this study used a test adapted for early childhood teachers by Paik and Kim (2008) based on Cropley's (2001) self-assessment of teachers' creative teaching methods. The teaching creativity test is divided into cognitive factors (19 items) and personality factors (16 items) and consists of 35 items in total. The subfactors of cognitive factors are divided into divergent thinking and acting, general knowledge and thinking base, and specific knowledge base and area specific skills whereas the subfactors of personality factors are categorized into focusing and task commitment, motivation and motives, and openness and tolerance of ambiguity. A 5-point Likert scale (1=not at all, 5=very much) was used to assess the items. The total reliability coefficient (Cronbach  $\alpha$ ) for teaching creativity, cognitive factors, and personality factors was .955, .925, and .909, respectively.

### *Teacher–child interactions*

Lee's (2003) equanimity scale was used to measure teacher–child interactions. The instrument consists of 30 questions divided into emotional interactions (10 items), verbal interactions (10 items), and behavioral interactions (10 items). All items were rated on a 5-point Likert scale (1=not at all, 5=very much). The total reliability coefficients for teacher–child emotional, verbal, and behavioral interactions were .957, .893, .885, and .875, respectively.

### *Play teaching efficacy*

The scale developed by Shin et al. (2004) was utilized to measure the teaching efficacy of early childhood teachers. The instrument is divided into beliefs about play teaching efficacy (12 items) and expectations about play teaching outcomes (9 items). All items were rated on a 5-point Likert scale (1=not at all, 5=very much). The total reliability coefficient of play teaching efficacy, belief in play teaching efficacy, and expectation of play teaching outcomes was .937, .905, and .881, respectively.

### ***Play support competence***

The scale developed by Kim (2021) was used to measure early childhood teachers' play support competence. It is divided into cognitive competence (10 items), affective competence (8 items), and behavioral competence (14 items) and consists of 32 items in total. The cognitive competence subfactors were divided into play support knowledge and play support skills. The affective competence subfactors were composed of play support beliefs and play support sensitivity. The behavioral competence subfactors consisted of play support planning, execution, and evaluation. All items were rated on a 5-point Likert scale (1=not at all, 5=very much). The total reliability coefficient of play support competence, cognitive competence, affective competence, and behavioral competence was .960, .900, .864, and .917, respectively.

### **Data analysis**

This study used SPSS 27.0 and SPSS PROCESS macro v4.1 to analyze the data. The specific methods were as follows. First, a frequency analysis was used to identify the general characteristics of early childhood teachers. Second, Cronbach's  $\alpha$  was calculated to verify the reliability of each instrument. Third, the means, standard deviations, skewness, and kurtosis of the research variables were determined through a descriptive statistical analysis. Fourth, Pearson's correlation analysis was conducted to examine the relationships among the research variables. Fifth, the serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions were examined using the SPSS PROCESS macro (Model=6) by Hayes (2022). To test the significance of the mediating effect of play teaching efficacy and play support competence, the bootstrap sample was set at 5,000 with a 95% confidence interval.

## Results

### Descriptive Statistics

The means, standard deviations, skewness, and kurtosis of the research variables of teaching creativity, teacher–child interactions, play teaching efficacy, and play support competence were analyzed. The results of the analysis are presented in Table 1. The descriptive statistics of the research variables showed that the skewness met the criteria of a normal distribution and kurtosis showed a stable distribution.

Table 1. *Descriptive statistics of the variable*

|                            | Variables                           | M     | SD   | Skewness | Kurtosis |
|----------------------------|-------------------------------------|-------|------|----------|----------|
| Teaching creativity        | Cognitive factors                   | 4.091 | .547 | -.594    | 1.083    |
|                            | Personality factors                 | 4.022 | .567 | -.632    | 1.136    |
|                            | Total                               | 4.060 | .536 | -.595    | 1.278    |
| Teacher–child interactions | Emotional interactions              | 4.344 | .551 | -.956    | 1.607    |
|                            | Verbal interactions                 | 4.308 | .560 | -1.144   | 2.713    |
|                            | Behavioral interactions             | 4.294 | .554 | -.999    | 2.140    |
|                            | Total                               | 4.315 | .530 | -1.021   | 2.465    |
| Play teaching efficacy     | Play teaching efficacy beliefs      | 3.985 | .601 | -.685    | 1.466    |
|                            | Play teaching outcomes expectations | 3.947 | .655 | -.745    | 1.281    |
|                            | Total                               | 3.969 | .586 | -.601    | 1.431    |
| Play support competence    | Cognitive competence                | 4.097 | .608 | -.796    | 1.604    |
|                            | Affective competence                | 4.172 | .599 | -.826    | 1.851    |
|                            | Behavioral competence               | 4.144 | .593 | -.979    | 2.391    |
|                            | Total                               | 4.137 | .563 | -.899    | 2.390    |

### Correlations

Pearson's correlation analysis was conducted to examine the correlation among early childhood teachers' teaching creativity, teacher–child interactions, play teaching efficacy,

and play support competence. The results of the analysis are presented in Table 2.

Table 2. *Correlations among variables*

| Variables                  | Teaching creativity | Teacher–child interactions | Play teaching efficacy | Play support competence |
|----------------------------|---------------------|----------------------------|------------------------|-------------------------|
| Teaching creativity        | 1                   |                            |                        |                         |
| Teacher–child interactions | .705**              | 1                          |                        |                         |
| Play teaching efficacy     | .742**              | .706**                     | 1                      |                         |
| Play support competence    | .812**              | .795**                     | .777**                 | 1                       |

\*\* $p < .01$

There was a significant positive correlation ( $r = .742, p < .01$ ) between the predictor, teaching creativity, and the mediating variable, play teaching efficacy, and a significant positive correlation ( $r = .812, p < .01$ ) between teaching creativity and play support competence. Teaching creativity showed a significant positive correlation ( $r = .705, p < .01$ ) with teacher–child interactions, which was the dependent variable. The mediating variable, play teaching efficacy, was significantly positively correlated with play support competence ( $r = .777, p < .01$ ) and significantly positively correlated with the dependent variable, teacher–child interactions ( $r = .706, p < .01$ ). There was a significant positive correlation ( $r = .795, p < .01$ ) between the mediating variable, play support competence, and the dependent variable, teacher–child interactions.

#### Analysis of serial multiple mediating effects

The results of the analysis are presented in Table 3 and Figure 2. Teaching creativity had a significant positive effect on play teaching efficacy ( $\beta = .812, p < .001$ ). Play teaching efficacy had a significant positive effect on teacher–child interactions ( $\beta = .174, p < .001$ ) and play support competence ( $\beta = .372, p < .001$ ). Teaching creativity had a significant positive effect on play support competence ( $\beta = .551, p < .001$ ), and play support competence had a significant positive effect on teacher–child interaction ( $\beta = .523, p < .001$ ).

The Serial Multiple Mediating Effects of Play Teaching Efficacy and Play Support Competence on the Relationship between Early Childhood Teachers' Teaching Creativity and Teacher–Child Interactions#

Table 3. *The sequential mediating effects of play teaching efficacy and play support competence*

| Variables                                                                 | $\beta$ | SE   | <i>t</i>  | LLCI* | ULCI** |
|---------------------------------------------------------------------------|---------|------|-----------|-------|--------|
| Mediating variable model (dependent variable: play teaching efficacy)     |         |      |           |       |        |
| (Constant)                                                                | .674    | .166 | 4.069***  | .348  | .999   |
| Teaching creativity                                                       | .812    | .040 | 20.073*** | .732  | .891   |
| Mediating variable model (dependent variable: play support competence)    |         |      |           |       |        |
| (Constant)                                                                | .425    | .127 | 3.337**   | .174  | .675   |
| Teaching creativity                                                       | .551    | .045 | 12.167*** | .462  | .640   |
| Play teaching efficacy                                                    | .372    | .041 | 8.972***  | .290  | .453   |
| Dependent variable model (dependent variable: teacher–child interactions) |         |      |           |       |        |
| (Constant)                                                                | 1.016   | .137 | 7.410***  | .746  | 1.286  |
| Teaching creativity                                                       | .109    | .058 | 1.890     | -.004 | .223   |
| Play teaching efficacy                                                    | .174    | .049 | 3.560***  | .078  | .271   |
| Play support competence                                                   | .523    | .059 | 8.926***  | .408  | .638   |

\*\* $p < .01$ , \*\*\* $p < .001$

\*LLCI: lower 95% confidence limit

\*\*ULCI: upper 95% confidence limit

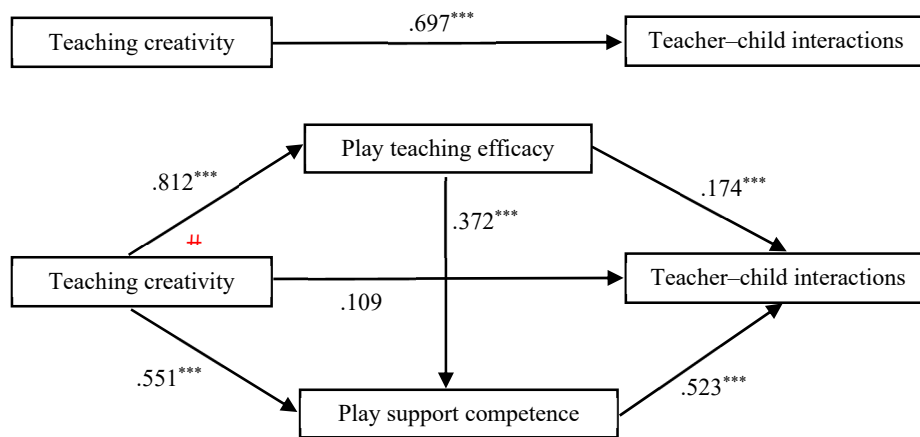


Figure 2. Effects of Each Path

\*\*\* $p < .001$

In this study, the total effect of teaching creativity on teacher–child interactions ( $\beta = .697$ ,  $p < .001$ ) was statistically significant; however, the direct effect of teaching creativity on teacher–child interactions ( $\beta = .109$ ,  $p > .05$ ) was not significant when play teaching efficacy

and play support competence were added as mediators, with a value of 0 at the 95.0% confidence interval. Therefore, play teaching efficacy and play support competence fully mediated the relationship between teaching creativity and teacher–child interactions.

As shown in Table 4, the total indirect effect is .587 (.429 ~ .736), which is significant at the 95.0% confidence interval, with no value of 0. Next, the mediating effect of play teaching efficacy on the relationship between teaching creativity and teacher–child interactions was significant at .142 (.035 ~ .230). The mediating effect of play support competence on the relationship between teaching creativity and teacher–child interactions was also significant at .288 (.192 ~ .404). Finally, the indirect effect of teaching creativity on teacher–child interaction through play teaching efficacy and play support competence was significant at .158 (.088 ~ .251). In other words, there were serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between teaching creativity and teacher–child interactions.

Table 4. *Testing for the significance of indirect effects*

| Paths                                                                                                             | $\beta$ | SE   | LLCI* | ULCI** |
|-------------------------------------------------------------------------------------------------------------------|---------|------|-------|--------|
| Teaching creativity → Play teaching efficacy<br>→ Teacher–child interactions (Ind 1)                              | .142    | .049 | .035  | .230   |
| Teaching creativity → Play support competence<br>→ Teacher–child interactions (Ind 2)                             | .288    | .054 | .192  | .404   |
| Teaching creativity → Play teaching efficacy<br>→ Play support competence<br>→ Teacher–child interactions (Ind 3) | .158    | .043 | .088  | .251   |
| Total indirect effect                                                                                             | .587    | .078 | .429  | .736   |
| Ind 1–Ind 2                                                                                                       | -.147   | .083 | -.330 | .002   |
| Ind 1–Ind 3                                                                                                       | -.016   | .074 | -.182 | .104   |
| Ind 2–Ind 3                                                                                                       | .130    | .056 | .023  | .242   |

\*LLCI: lower 95% confidence limit

\*\*ULCI: upper 95% confidence limit

Meanwhile, the results of the indirect effect between the mediating paths showed that the difference between the mediating paths of play teaching efficacy and play support competence was -.147 (-.330 ~ .002), which was not significant, with a confidence interval

of 95.0% and a value of 0. This indicated that there was no difference in the effect between the mediating paths of play teaching efficacy and play support competence. The difference between the indirect effect paths Ind 1 and Ind 3 was  $-.016$  ( $-.182 \sim .104$ ), which was also not significant. However, the difference between the indirect effect paths Ind 2 and Ind 3 was  $.130$  ( $.023 \sim .242$ ), which was significant at the 95.0% confidence level. This suggests that the single mediating effect of play support competence on the relationship between teaching creativity and teacher-child interactions is stronger than the dual mediating effect via play teaching efficacy.

## Discussion and Conclusion

This study aimed to examine the serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. The conclusions of this study are as follows.

First, play teaching efficacy had a full mediating effect on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. This supports Lee's (2021) finding that teaching creativity has a positive effect on play teaching efficacy and that teachers with higher play teaching efficacy have more positive teacher–child interactions (Kim & Lee, 2021; Shin, 2000). In other words, the higher the teaching creativity of early childhood teachers, the higher their play teaching efficacy, and the higher the level of teacher-child interactions.

Second, play support competence had a full mediating effect on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. These results are consistent with the findings of Yim (2021), who found that teaching creativity had a positive effect on play support competence, and Kim (2022), who found that teachers with higher play support competence had more positive and active teacher–child interactions. Fang et al. (2022) also found that early childhood teachers' teaching creativity influenced teacher-child interactions through play support competence. These results suggest that the more open-minded and new-thinking early childhood teachers are, the more competent they are in effectively supporting children's play and the more appropriate and high-quality teacher–

child interactions they have in play situations.

Third, the serial multiple mediating effects of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions were confirmed. In particular, the direct effect of teaching creativity was not statistically significant when play teaching efficacy and play support competence were included in the relationship between teaching creativity and teacher–child interactions, indicating a full mediating effect. This result is consistent with Lee and Kim's (2022) study, which found that teaching creativity has a static effect on play teaching efficacy and that play teaching efficacy has a static effect on play support competence (Han, 2022; Yim, 2022). It also supports the findings of Fang et al. (2022) that play support competence has a direct effect on teacher–child interactions. This suggests that early childhood teachers with high teaching creativity have stronger beliefs about their ability to confidently support children's play, and these beliefs lead to higher play support competence, which ultimately positively affects their interactions with children.

Based on the above conclusions, the study implications are as follows. Early childhood teachers' play teaching efficacy and play support competence serially mediated the relationship between teaching creativity and teacher–child interactions. These findings suggest the need for educational interventions to develop early childhood teachers' teaching creativity to enable high-quality teacher–child interactions. Specifically, early childhood teachers need to be supported in their professional development through training programs with experts in creative teaching methods. Additionally, pedagogical approaches that share practical examples of teaching creativity through mentoring programs with experienced teachers or regular seminars are required.

In particular, this research found a full mediating effect of play teaching efficacy and play support competence on the relationship between early childhood teachers' teaching creativity and teacher–child interactions. Findings suggest that training to develop early childhood teachers' play teaching efficacy and play support competence is necessary for high-quality teacher–child interactions. Recently, as the importance of child- and play-centered education has been emphasized in South Korea (Ministry of Education, Ministry of Health and Welfare, 2019), educational support for teachers has been provided through nationally operated portal sites (e.g., <https://i-nuri.go.kr/main/index.do>) and the office for Korea Childcare Promotion

Institute's central support center for childcare (<https://eng.educare.or.kr/>). Large-scale teacher trainings are currently underway. Training is also needed through collaborative, small-group teacher-community meetings. In addition, field-based practical programs, such as effective teacher-child interaction skills that are age-appropriate and appropriate for different play situations, and teacher studies that share various examples of play-based education, should be strengthened. Most importantly, early childhood teachers need to recognize the need for competence building in teaching and make efforts to develop their competence in teaching creativity, play teaching efficacy, and play support competence. This study confirms the importance of early childhood teachers' play teaching efficacy and play support competence in enhancing teacher-child interactions in relation to the 2019 revised Nuri curriculum.

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