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## Child-centered, Play-based Education and Future Competency

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## Child-centered, Play-based Education and Future Competency

**Inkyung Kim**, Fellow at KDI

**“The child-centered, play-based curriculum enhances young children's problem-solving skills and socio-emotional competences. As such, in order to firmly establish it within the education system and bolster its effectiveness, guardians and teachers must collaborate to support children's play activities, and a mutually beneficial learning community for teachers must be built.”**

### I . The Child-centered, Play-based Curriculum and Challenges to its Establishment

With the rapid developments in AI, robotics and biotechnology, among others, our children will witness jobs being created and becoming obsolete at ever-increasing speeds. Indeed, although the impact of the changes in science and technology cannot be accurately predicted and reflected in education at present, the labor market will continue to evolve and reshape.

To that end, in order to enhance adaptability, education should veer away from traditional methods of teaching subjects that may not have any use or value in the future, and focus on nurturing children's problem-solving skills. Specifically, students need to be equipped with the ability to define pending problems, obtain the necessary information, and collaborate with others to seek out creative solutions. Even if their initial approach fails, they should have the capacity to pursue other means based on their resilience and motivation to self-learn. These

**To improve adaptability, education must focus on enhancing students' problem-solving skills.**

\* Based on Kim, Inkyung, Shunah Chung, and Bo Young Park, *A Study on Education Innovation and Competency: Focusing on Kindergartens*, Research Monograph 2020-01, Korea Development Institute, 2020 (in Korean).

In the child-centered, play-based curriculum, children experience the problem-solving process via self-directed play with their teacher's support

Support from teachers should be based on the children's play experiences in and outside of the classroom.

For the new curriculum to take hold, a sufficient number of execution examples and analysis of its effects on children's competences are needed.

competencies can be developed by motivating students—with the support of teachers—to take the initiative in deciphering related information, and systematically applying their findings; sometimes with their peers, teachers or other adults. During this process, teachers play the role of guide and facilitator as well as co-learner by sharing their ideas, asking questions, and providing the necessary resources and activities.

The same is true for early childhood education. Indeed, the government revised the preexisting Nuri curriculum, and implemented a child-centered, play-based program in March of this year. The new curriculum is based on the belief that children's individuality and uniqueness should be respected, and that they are able to direct their own learning. Early childhood is seen as a phase in which mental and physical health, autonomy, creativity, aesthetic sensibility, and the ability to coexist are cultivated. Play-based education centers around activities that do not pursue any pre-planned goals and encourage enjoyment through initiative and spontaneity. They also encompass the characteristics of the problem-solving process such as establishing a hypothesis and setting goals, challenges, observation, experimentation, immersion, cooperation, imagination, creativity, intrinsic motivation, self-directed control, transformation, and creation. Of course, children learn about space and objects through play and acquire knowledge of their properties, functions and uses, and skills such as counting and reading.

Within a play-based curriculum, play is not only a method of learning, it is also the content and process. Before the revision of the Nuri curriculum, it was often the case that teachers would prepare the contents in advance based on a teaching plan and lead the class using play as a tool to draw the children's attention. Meanwhile, in the new curriculum, teachers must observe their students' play and support them to explore and evaluate subjects of interest with their peers, teachers, and guardians and, at the same time, grasp how this support is reflected in the children's play in and outside of the classroom, and develop a progressive teaching plan. Additionally, teachers must empathize with the children's needs and feelings, flexibly responding through warmth and calmness to gain trust and positive interaction. To put it another way, the child-centered, play-based curriculum has three elements: ① acceptance of play, ② positivity towards the child as the leader of the learning process, and ③ warm support.

<Table 1> Curriculum Comparison: Preexisting vs. Revised

Preexisting curriculum	Child-centered, play-based curriculum
Teachers organize contents based on a teaching plan, and impart knowledge using play activities as a tool to draw attention.	Teachers acknowledge each child's individuality and initiative to learn, and provide warm support using play as the method, content and process.

However, it is difficult to establish such a curriculum due to the lack of experience on the teachers' part, and the high expectations of parents for education that is centered around the acquisition of academic skills. There is also a misunderstanding among teachers that the curriculum requires them to become mere onlookers as the children play, and only intervene when a problem occurs. Nevertheless, there is still a lack of precedent to clear up the confusion, and more importantly, parents may not be receptive even if teachers are willing to implement the new curriculum. Indeed, some parents demand academic programs for their young children, including reading, writing, and math, in preparation for elementary school, and

gaining their approval, especially when the effects of the curriculum have yet to be proven, will be a major undertaking. Despite execution examples<sup>1)</sup> from overseas confirming the positive effects on academic achievement in the short-term, the overriding view remains that the curriculum is ineffective or only effective in the mid- to long-term.

As aforementioned, not only is early childhood not a period for academic achievement, recent approaches have been made in early childhood education from 'executive-function' and 'problem-solving' perspectives which predict a child's overall success in life. Indeed, once teachers are properly trained and analyses can confirm the effects of the curriculum on the development of executive function, there will be more execution examples and concerns over necessity will be eased.

Accordingly, this study conducted a teacher training course designed to strengthen teachers' ability to execute the child-centered, play-based curriculum, and analyzes the degree of execution and the effect on children's executive function and socio-emotional competencies as well as the relationship between them.

## II. Teacher Training to Strengthen the Execution of the Child-centered, Play-based Curriculum

### 1. Participants

To analyze the effects of training, the participating kindergartens in Sejong-si (independent public) were randomly divided into two groups, and only one group undertook the program from November 2018 to June 2019. The subjects were comprised of homeroom teachers who taught three- to four-year-olds in 2018 and four- to five-year-olds in 2019.

### 2. Method of teacher training

It is widely known that teacher training is effective in improving teaching skills and children's competencies only when it impacts the teacher's educational beliefs, knowledge, and practices. Here, educational belief refers to a teacher's perception about the desirable form of education, and unless it changes through training, teachers will continue to arbitrarily select and accept knowledge that conforms to their own beliefs and progress cannot be made. For the training to be beneficial and help teachers find a practical developmental alternative, tailored programs must be provided on a small scale for an extended period of time by competent instructors who have a contextual understanding of the realities of the classroom.

As a form of training that encompasses the above, the project researchers chose class critiquing. This method considers the various elements related to actual classroom situations, and entails writing interpretations as well as discussions between those doing the critiques and those receiving it.

The researchers collected the teaching materials of each participant for the respective activity, filmed classes in progress, and provided critiques; based on which, the instructors and teachers

Class critiques, which provide actual examples of the curriculum in operation, were conducted as a form of teacher training.

The training was designed to improve teachers' educational beliefs, knowledge, and practices.

1) See Kim, Chung, and Park (2020), <Chapter 2 Preceding Studies> for relevant studies.

&lt;Table 2&gt; Excerpt from a Class Critique, 「Various Play Materials」

Play materials refer to unstructured art materials such as clay, paper, paint, plastic, and natural objects. In the child-centered, play-based curriculum, play materials take on various forms, and can make play activities more interesting and create new (play) experiences (Seo, 2017). Among these play materials, paper is the most commonly used material in the classroom, and the children in 'A' class played in various areas of the classroom, using colored paper.

#### #1 Paper folding

Three boys are making paper fortune tellers. Those who cannot do it ask for the teacher's help.

...

#### #3 Making accessories

Two children are sitting in the painting area and rolling/folding colored paper, fixing them in place with sticky tape. Then, they glue sequins to it to make bracelets and crowns.

Those in the art area are into similar play. They are making butterflies with colored paper and fastening them with tape. They then roll up a piece of colored paper and attached it to the butterflies to form a handle.

#### #4 Making books/Writing

In the art area, a child removes the 'A' class motto from the wall and copies it on the colored paper. At the desk next to the art area, children are folding colored paper to make a book and writing in the books.

...

When I was a teacher, I used to provide the children with paper of various sizes (whole paper, folio, quarto, octavo, 16mo and long strips), thicknesses (thin writing paper, printing paper, general sketch paper and thick drawing paper), textures (corrugated cardboard, etc.) and colors. Then, they would devise their own paper play activities such as drawing, folding and cutting with scissors.

Children in my classroom particularly enjoyed cutting long paper strips with scissors, so I made a separate space for them to focus and to share ways to cut the paper with their peers.

They became immersed in making paper crocodiles and each started cutting out long strips of paper in any way that they could think of. As this case shows, children can play in numerous ways using various types of paper. Children in 'A' class could also have more fun if they were provided with a more varied variety of paper.



Separate section for children cutting out long paper strips

*Note:* The above critique reviews the teacher's acceptance of and support for play (#1 Paper folding), children's active learning by transforming play materials in creative ways without the teacher's direction (#3 Making accessories), and participating in writing activities (#4 Making books/Writing). By providing teachers with such a critique, which consists of purposeful observations, this process intends to encourage their acceptance of the curriculum's three elements (teachers' support in play activities, characteristics of play, children's initiative to learn) instead of directly teaching them.

*Source:* Revision of <Table 5-16> from Kim *et al.* (2020).

The training improved the teachers' ability to execute the child-centered, play-based curriculum.

exchanged their interpretations. The written critiques focused on specific observations (filmed) in light of the teachers' perceptions about the curriculum and their direction of evolution. The contents include 1) the characteristics of play; 2) the features of children as a learner e.g. understanding the use of play materials, sharing experiences, being socially competent, creating stories to aid development, managing risks, being unafraid of failure, evaluating play, etc. and; 3) the features of an educator e.g. listening to the children's experiences, showing understanding and warmth, providing guidance on play (guide), offering support and a play space according to the play flow (facilitator), responding and participating in play activities,

helping to realize imaginations, reflecting ideas in play activity, and sharing and expanding the children's current and past experiences and the teacher's ideas (co-learner). For teachers with no apparent interest in the curriculum, the researchers focused on the characteristics of play and aspects of children as active learners by describing the play activities observed in class. Also, to motivate those who were hesitant, the critiques presented actual cases that could be readily applied in the classroom (Table 2). The critiques for teachers who had already implemented the curriculum only examined interactions that can be regarded as a part of the child-centered, play-based curriculum, and expressed support with reference to related theories. Sharing critiques was encouraged among the participants, and once completed, the critiques were sent to the teachers who then met with the instructor to exchange opinions in a comfortable and supportive environment.

### **III. Analysis of the Effects of Teacher Training on Teachers and Young Children**

#### **1. Period and categories of data collection**

To analyze the effects of teacher training through class critiquing, data was collected immediately before and after the class critiques, and four months thereafter. The survey categories include teachers' degree of execution of the curriculum, the children's executive function and socio-emotional competences, and the sociodemographic characteristics of the children, parents and teachers which were used as a control variable. And, the effects of the critiques were evaluated using the difference-in-difference model which compares the changes in outcome (dependent) variables before and after class critiquing between participating and non-participating kindergartens.

#### **2. Level of execution**

It was found that class critiques improve classroom interaction and children's happiness and immersion, reduce teacher-child conflict and dependence, and enhance familiarity, all of which serve as performance indicators for the teacher's execution of the child-centered, play-based curriculum.<sup>2)</sup>

In the classroom interaction assessment scale, scores increase when teachers show more of the following attitudes. Above all, teachers should acknowledge children's play and provide the necessary materials, books, and resources. Furthermore, they should work with the children to create and participate in activities that are related to the children's interests and experiences (e.g. responding to the child's invitation to play, finding solutions to disputes, organizing the classroom, preparing field trips, reading books, exploring activities, etc.). Here, to aid the development of language skills and advance learning, teachers should ask open-ended questions, provide new reference materials, devise problems, consider and vocalize children's

2) The scale for classroom interaction is 'Sustained Shared Thinking and Emotional Well-being' and that for children's happiness and immersion is the 'Lauven Scale.' The project researchers (Kim *et al.*, 2020) translated English terminology into Korean and inquisitors gave scores. For the teacher-child relationship, Sung (2017)'s translation of the Student-Teacher Relationship Scale was used and teachers graded each child's response.

thinking process, serve as a role model, and set a framework (e.g. using correct language, scientific inquiry methods, emotional expression, etc.). At the same time, teachers should apply social disciplines while being aware of the children's needs and emotions to prevent feelings of alienation, interacting through warm language and gestures, supporting their interests and excitement, encouraging positive feedback among peers, and praising not the outcome but the positive learning attitudes seen during the learning process. Subsequently, teachers need to evaluate the level of a child's participation in activities and how much previous activities are incorporated into following activities, and reflect this into their activity plans. In addition, they should work together with guardians to assess the children's language skills and provide support for parents to play with their children at home.

Kindergartens who adopted the class critiquing method exhibited a huge, albeit temporary, enhancement in classroom interaction. Teachers who marked average scores in the category saw a 41.5% improvement immediately after their critiques; determined to be because the critiques eased the confusion over the new teaching methods ahead of the implementation of the revised curriculum. Nevertheless, the positive effects waned after four months, probably due to non-participating kindergartens gaining a better understanding of the new curriculum and participating kindergartens failing to continue with the critiques until the end of the research period. Meanwhile, participants exhibited only a slight increase in their scores for the category of 'guardians and teachers working together to assess the development level of language skills,' a criterion for classroom interaction, while none of the teachers fulfilled the category of 'providing support to enable guardians to play with the children' during the project period. Teachers found it difficult to share the children's experiences in the classroom with their guardians and to collaborate with them to bolster the children's development.

Happiness is the level of emotional comfort, spontaneity, self-confidence, receptivity to class assignments, and self-positivity exhibited by children while immersion refers to persistence, concentration, patience, vitality, and willingness to explore. Both elements are characteristics of play and could be bolstered if class critiques could reinforce teachers' ability to execute the child-centered, play-based curriculum and change their teaching practices. Indeed, the average scores for happiness and immersion of three- to four-year-olds increased 16.7% and 28.5%, respectively, immediately after class critiques, with the positive effects being maintained at 8.6% and 10.6% for four months thereafter.

The new curriculum can also improve teacher-child relationships which have the following characteristics: teacher's acceptance of the children's need to choose their own play, attention and warm response to the children's verbal and non-verbal expressions, provision of necessary materials, and encouragement of the children's growth. Class critiques were found to alleviate conflict and dependence and improve familiarity between the teachers and their three- to four-year-old students. Conflict was gauged by the degree of hostility or discord between teacher and child while dependence was measured by the children's need for the teachers' attention, praise and help, and familiarity by the amount of warm and open communication. The degree of conflict between children and teachers who maintained an average relationship fell by 16.1% (13.1% after four months) immediately after the critiques. Meanwhile, dependence dropped by 12.9% (15.5%) and familiarity improved by 6.2% (7.6%).

Teachers found it difficult to share the children's experiences in the classroom with their guardians and to discuss measures on supporting the children's development.



Thus, it can be determined that class critiques have a longer-term effect on young children's happiness, immersion, and relationships than classroom interaction.

### 3. Children's cool executive function and socio-emotional competences

Class critiques were effective in improving the children's cool executive function and socio-emotional competences. Executive function is a psychological competence through which individuals combine and apply accumulated information to fulfill a goal while controlling their impulses and establishing an action plan, putting it into practice, and attempting different strategies if the first fails. It can be divided into working memory, inhibition, and cognitive flexibility. Working memory is a mental process that holds and connects information, inhibition is the suppression of impulses to focus on what one wants, and cognitive flexibility is the process of thinking through various alternatives to solve a problem and switching thinking between different tasks. Working memory is divided into visual-spatial and phonology memories. For instance, when reading a book, children read the following passage with the preceding passage still in mind; they can remember being told by their parents that violence is wrong when there is trouble with friends; they can focus on what their teachers say and the given tasks; they are able to seek a new solution when their answer to a problem is wrong and; they can read while watching TV. Cool executive function is used when performing abstract tasks that do not accompany emotion, and the level is measured by tasks that are removed from the situations that the children are in at the time.<sup>3)</sup>

According to the data analysis, class critiques improve the inhibition of four-year-olds, and the cognitive flexibility of three- to four-year-olds. Among those with an average level of inhibition and cognitive flexibility, the former improved by 8.9% immediately after the critiques and by 10.4% four months after; cognitive flexibility improved by 15.4%.

Children with high executive function have excellent problem-solving skills and thus, are likely to experience more success in life. Executive function develops rapidly in early childhood, and the level during this period provides some foresight into how the children will be in the future. Moreover, it is a better indicator than IQ in terms of revealing when a child is ready to start school. It is closely related not only to early childhood characteristics, such as problem behaviors, controlling emotion, forming interpersonal relations, adapting to educational institutions, and attention/concentration, but also to adulthood characteristics, such as resilience, productivity at work, maintaining a job and marriage, health, income, and even the crime rate.

Teacher training in the form of class critiques was effective in improving children's cool executive function and socio-emotional competences.

Executive function is a problem-solving skill and a psychological competence with which individuals combine and apply accumulated information to fulfill a goal while controlling their impulses and establishing an action plan, putting it into practice, and attempting a different strategy when the first fails.

Executive function can be divided into working memory, inhibition, and cognitive flexibility.

Teacher training enhanced children's inhibition and cognitive flexibility.

3) There is also hot executive function, which is used to perform tasks associated with emotion or motivation, and is measured in situations that incur a reward or fear. When individuals perform a task, they usually use both cool and hot executive functions, but the former is known to develop faster ([www.understood.org](http://www.understood.org), last access: April 30, 2020). To test a child's cool executive function, the researchers used the 'Early Years Toolbox' (Appendix Table) which is an iPad application game for which the researchers of Kim *et al.* (2020) provided the Korean voices and the developer inserted into the application. The visual-spatial working memory test shows children an ant drawing with a sticker on it, and the sticker is then removed from the drawing. The children are then asked to put the sticker back in the right place. The higher the level, the more stickers there are to remember. The phonology working memory test is to check how well children can match the right color, shape and size to the voice description, and the higher the level, the more complex the description becomes. The inhibition test shows a series of images of fish and sharks and the children are asked to touch the screen on the fish only. Since fish appear four times as much as sharks, this test can check whether children can control the prevailing stimulus. The cognitive flexibility test consists of three stages: 1st stage to classify blue ships and red rabbit cards under the same-color flag; 2nd stage to classify the images according to their shape and; 3rd stage, a last stage to sort the cards with borderlines by color and those with no borderlines by shape.



Executive function can serve as an indicator for children's problem behaviors and emotional control as well as their future experiences e.g. resilience, maintaining a job and marriage, health, income, and the crime rate.

Teacher training improved children's extrinsic and intrinsic problem behaviors and socio-emotional competences e.g. emotional self-control.

The child-centered, play-based curriculum creates an environment that can foster children's executive function.

The execution of the curriculum enhances children's executive function and improves their socio-emotional competence either directly or via the executive function.

Meanwhile, it was found that class critiques moderated extrinsic (aggressiveness, rebelliousness, anger, frequent mood swings) and intrinsic (anxiety, sadness, depression) behaviors and strengthened emotional self-control (calmness, easygoing nature, overcoming reactive anger, less mood swings).<sup>4)</sup> Among children with an average level of problem behaviors and emotional self-control, the score for extrinsic behavior dropped by 21.6% immediately after the critiques and 23.4% four months after while that of intrinsic behavior decreased 35.0% and 35.3%, respectively, and that of self-emotional control improved 9.3% and 9.4%. In addition, the three- to four-year-olds exhibited an improvement in perseverance; gauged based on whether they gave up during the executive function test. Among the three-year-olds, the probability of giving up during the phonology memory test at the beginning fell 10.5%p immediately after the critiques and 6.7%p four months after while that for four-year-olds decreased 8.7% during the same period.

#### IV. Execution of the Child-centered, Play-based Curriculum and Children's Competences

Environments that encourage the development of executive function in early childhood can be created through the child-centered, play-based curriculum. The function only develops when it is used, and play activities organically place children in such situations. For instance, while role-playing, children suppress the urge to talk and intervene until their turn, and use their working memory to remember their friends' roles and storylines, and cognitive flexibility to resolve disagreements with friends and establish common rules. Executive function can be further enhanced in non-stressful situations in which children feel competent, enjoyment, fellowship and a sense of belonging. The child-centered, play-based curriculum recognizes that children are active learners, and encourages them to engage in enjoyable play and accept the teacher's warm support to develop their social skills. According to an analysis of the path of outcome variables using kindergarten-level data, the degree of curriculum execution—measured through classroom interaction, children's happiness and immersion, and teacher-child relationship—has a certain effect on children's cognitive executive function.

Also, as mentioned above, executive function helps to predict children's socio-emotional competences. The analysis of kindergarten-level data reveals that the degree of execution serves as a medium for children's cognitive executive function, and hence, affects socio-emotional competencies such as problem behaviors, emotional self-control, and perseverance. The degree of execution itself is also found to have a direct effect on these competencies.<sup>5)</sup>

4) Children's socio-emotional competences are also included in the survey for the Early Years Toolbox. Scores are assigned according to the degree of the children's behavior (e.g. when they do not follow others or challenge them, feel sad or gloomy, or get angry easily over small issues). Teachers grade each child's response.

5) Details on the degree of curriculum execution and the numerical relationship between cool executive function and socio-emotional competence are described in Kim, Chung, and Park (2020), Section 4 of Chapter 4.

## V. Conclusion

The future will see accelerating technological development and mounting job uncertainties. Accordingly, early childhood education should foster problem-solving skills to enable children to effectively adapt to rapidly changing environments. Problem-solving skills refer to the ability to select and connect information necessary to solve a problem and devise a solution, and to seek different methods by adding or rearranging information when the first attempt fails. In the child-centered, play-based curriculum (initiated this year), teachers are encouraged to provide warm support while recognizing child-led play activities as the method, content and process of learning. Children are allowed to choose their own play activities, and both the child and teacher work together to devise related activities which serve as a foothold for learning language, reasoning, exploring and relationships, among others.

Following the introduction of class critiques, the degree of execution improved as did the children's executive function and socio-emotional competencies. Class critiquing is a form of teacher training that analyzes aspects of a class based on the theory of child-centered, play-based education, and provides teachers with conviction about their teaching methods or measures to improve them.

Execution of the child-centered, play-based curriculum enhances children's executive function, and improves their socio-emotional competences either directly or through the executive function. To that end, in order to bolster the ability of teachers to execute the new curriculum, class critiques could be conducted within the teacher community. The receptivity to class critiques is high because the teacher's intentions in the classroom are understood; the observed positive elements are interpreted through relevant theories and; practical examples are presented for the teachers to apply in their classes. On the other hand, class consultations and instructional supervision could diminish teaching efficacy as they focus on providing the 'right' answers to challenges and teachers could feel that their weaknesses are exposed. Moreover, many find that it is difficult to apply what they have learnt to different problems after the training course. However, because written critiques do not disclose any flaws, there is less burden to open up classrooms and share critiques; broader participation and sharing would generate more ideas.

For the child-centered, play-based curriculum to successfully take root, teachers and guardians must work together to enable children to lead the learning process. Once teachers grasp the effects of the curriculum on children's development and continue to improve their ability to execute it through class critiques, they will acquire a better understanding of the educational beliefs, knowledge and practices of the curriculum. Based on this, teachers will be able to further develop their students' executive function and socio-emotional competences by gaining insight into the children's experiences at home, applying them in the classroom and providing suggestions to guardians on how they should support their children in line with the flow of their play.

For the curriculum to take root and to be more effective, class critiques should be conducted in greater numbers, and collaboration is needed between teacher and guardians to support children's play.

<Appendix> Test on Cool Executive Function



Source: Screenshots from the 'Early Years Toolbox' application (saved: Jun. 25, 2019); Partial citation from <Table 3-22> in Kim, Chung, and Park (2020).

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