A Study of Interactive Playground for Kindergarten in Cempaka Putih

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Abstract. This paper presents the study of using Interactive Playground, motivated by the condition of children which increases the adverse effects of lack of play, so the purpose of this budget is to get game designs that can facilitate children's play and learning activities. Problems in design are: How playgrounds are applied in interactive design and also kindergartens in DKI Jakarta still have a lot of limited space and land for playing and child development through games. The purpose of this is so that children can experience learning well, succeed, develop social and physical skills. This research uses observation, comparative study, site analysis, typology, activity patterns, mass formation and simulation. Interactive Playground, from the results of comparative studies from several kindergarten schools from domestic and abroad called class rooms and other facilities require different spaces compared to nursery schools in Indonesia specifically in Jakarta.

Keywords: Interactive Playground, Children, Play

1. Introduction

This study was raised based on one of the United Nations Habitat programs that focused on providing universal access to safe, particularly for women and children. Building a generation that is advanced and brilliant can be done through an educational process that is capable of increasing human competence and capacity as subjects and objects of civilization. At present, the steps of institutions engaged in education are competing to carry out curriculum improvement and learning methods, both in the introduction and application of technology to prepare generations in the current era of globalization and information [1].

One effort to improve awareness and the importance of education and the quality of education itself is a kindergarten, the goal is because parents who want their children to grow and develop get a decent education. Many parents send their children to school so that the child can master skills such as reading, counting writing. They assume that if children can immediately master it the child's development will be better. But in fact, this is not by the stage of child development. Learning to
understand the concept of addition and subtraction, writing and arithmetic in early childhood or kindergarten is one of the biggest mistakes and harms children's development. Learning that only focuses on the mastery of reading, writing and arithmetic is something that is incomplete and harms children's development because it will only develop some aspects of individual skills while "turning off" the development of other skills [2].

Thus what is more desirable is an approach and education strategy for children that is more integrative and comprehensive and following the world and its needs. In the kindergarten learning guidelines, one of the learning approaches used in the 2013 Curriculum is an integrated thematic approach. In the integrated thematic learning model in kindergarten, activities carried out for one theme, sub-theme, or sub-theme are designed to achieve a joint competency of attitudes, knowledge, and skills to cover part or all of the scope of development. Implementation of learning as done through interactive, inspirational, fun, contextual, and child-centered play to actively participate and provide flexibility for the initiative, creativity, and independence by children's talents, interests, and physical and psychological development.

- Interactive is a learning process that prioritizes interactions between children, students, and educators, as well as children and their environment.
- Fun is a learning process carried out in a free and comfortable atmosphere to achieve learning objectives.

Implementation of learning is done through direct and indirect learning that occurs in an integrated and not separate. Direct learning is the learning process through direct interaction between children and learning resources that are designed in the Learning Implementation Plan. Interactive Games are games that involve a lot of participants in the game process. This game aims to stimulate the creative. Creative activities related to the creation, production, and distribution of computer and video games that are entertainment, agility, and education. Interactive game groups are not dominated as entertainment solely but also as a learning or educational aid [3].

Many kindergartens in DKI Jakarta still have limited space and land to play and develop children through games. Most kindergartens in Jakarta only have not very large room, because the kindergarten functions are combined with more advanced levels such as elementary, middle, and high school, some even have small classrooms in several kindergarten schools in Jakarta. This can limit the activities and movement of children because according to the NSPK guidelines on infrastructure for early childhood education in the needs of children as a basis for design, one of which is the freedom of children to carry out activities, namely early childhood is very active, so we need an environment that provides opportunities for children to move freely because children at this age have an active nature and the habit of running around in the room [4].

Therefore, a formal kindergarten school is needed with an Interactive Playground approach, which is an installation that combines the benefits of traditional playgrounds with technological advancements. To provide an exciting game experience, designed to feel, learn, and adapt to the behavior of users. As such, they can motivate children to explore and interact with the environment, develop social and physical skills, or promote positive social interactions among those who can provide education using interaction, learning with fun, and getting to know the environment and without being forced and also kindergarten children who can give more freedom for children in their activities With the kindergarten with an Interactive Playground approach is a fun tool for children's learning so that children will explore their world without coercion and build their knowledge (independent) is expected that children can develop well to produce children with quality human resources for the nation.

According [5] to indicators in designing Playgrounds in an Interactive Playground approach in schools, namely:
Table 1. Playground Indicator Design with Interactive Playground approach

| Design guide for improvement of motor skills | The design should be in a way to ensure the child's freedom of movement. |
|---------------------------------------------|------------------------------------------------------------------------|
|                                             | The design should be in a way that the instrument would engage the child's entire body, like in pushing, pulling, running, jumping and escaping activities. |
|                                             | The design should ensure getting involved of the smaller limbs of the child during the game playing, so that the small muscles, too, would be strengthened in the course of such activities as playing with buttons (buttoning and unbuttoning), zippers, keyboards, and tying and untying using the fingers. |
|                                             | The design should turn the complicated activities into simple ones and rid the child of getting involved in complicated movements. |

| Guidelines for designing instruments to improve cognitive skills | The playgrounds should be designed in a way to facilitate the child's planning for getting involved in an activity. |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|                                                                | We propose designing instruments for the playgrounds that resemble the grownups' world. |
|                                                                | The design should be such that the children would be able to express their opinions in choosing the games they wish to play. |
|                                                                | The games should have rules and be designed in accordance with certain logic. |

| Guidelines for designs aimed at improving social skills | Instruments at public playgrounds should facilitate cooperation among a group of children without creating nuisance for the others. |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|                                                        | The playgrounds should have both instruments for the children in higher age groups and those for group games of younger children. |
|                                                        | The games should provide the possibility of grownups' participation so that the children would also learn how to interact with them more effectively. |

| Guidelines for designing instruments aimed at improvement of affective and emotional skills | There should be spaces within the playgrounds aimed at improving their touching skills, such as sand boxes and areas for playing with water. |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                                                                         | Designing instruments that generate noises and music can improve the child's hearing capability. |
|                                                                                         | The colors used in designs should have high contrast and be comprised of a harmonizing combination of various colors, since the children in age groups that use the playgrounds are attracted towards areas with bright and jubilation colors. |
|                                                                                         | The designs should improve the children's capability to achieve individual success. |
|                                                                                         | The designs should be in a way not to decrease the child's concentration while playing. That is because the children's perceptions are still weak. |
|                                                                                         | The playgrounds are atmospheres where people with various cultures and from different social classes take advantage of, and therefore they should be designed in a way to match the demands of such a varied group of users. |

2. Methodology

2.1. The method of study

The purpose of this research is to be able to find any space program needed in a kindergarten with an Interactive Playground approach and design new functions that can support children's activities in activities so that they can help the growth and development of children. The methodology used in this study is to collect data that is secondary data because secondary data is the fastest way than collecting primary data which requires more time considering this research requires a short amount of time. Secondary data collected in the form of journals, theses, and book literature. After the data collected is followed by a comparative study of several kindergarten schools based on indicator points as
guidelines and a comparison of these data can be used as a reference to design what is needed to design with that approach.

2.2 Case study
The site is located in Cempaka Putih, Center Jakarta. Tread is located in front of Jl. Cempaka Putih Barat. In that place is an area of housing for middle residents. According to the Jakarta City RT / RW, the land is intended for educational facilities. The land area is estimated at 3400 m² with flat land topography. Center Jakarta, especially Cempaka Putih Subdistrict, is a city that is intended as an area near housing, so that adequate educational facilities are needed to provide decent education for local residents.

![Figure 1 The site context](image)

Site selection can be seen from the number of educational facilities in the surrounding area which are still said to be lacking to fulfill the education in that area. Site selection is also sought on the edge of the roadside so that the achievement of the site can be easily achieved by local residents and public transportation.

3. Result and Discussion

3.1. Comparative study based on indicators point
1. KO Kindergarten

| Table 2. Comparative result for KO Kindergarten |
|-----------------------------------------------|
| **Aspect** | **Points**                                                                 | **Rating** | **Info.** |
|            | Should be in a way to ensure the child's freedom of movement                | √           |           |
|            | instrument would engage the child's entire body, like in running and jumping | √           |           |
|            | The design should turn the complicated activities into simple ones         | √           |           |
| **Improving motor skills**                    | The playgrounds should be designed in a way to facilitate the child's planning for getting involved in an activity. | √           |           |
designing instruments for the playgrounds that resemble the grownups' world.

design should be such that the children would be able to express their opinions in choosing the games they wish to play.

The games should have rules and be designed in accordance with certain logic.

facilitate cooperation among a group of children without creating nuisance for the others.

instruments for the children in higher age groups and those for group games of younger children.

should provide the possibility of grownups' participation so that the children would also learn how to interact with them more effectively.

There should be spaces within the playgrounds aimed at improving their touching skills, such as sand boxes and areas for playing with water.

Designing instruments that generate noises and music can improve the child's hearing capability.

The colours used in designs should have high contrast and be comprised of a harmonizing combination of various colours.

The designs should improve the children's capability to achieve individual success.

designs should be in a way not to decrease the child's concentration while playing.

should be designed in a way to match the demands of such a varied group of users.

| Aspects                          | Points                                                                                                                                                                                                 | Rating |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|                                  | Should be in a way to ensure the child's freedom of movement                                                                                                                                     | √      |
|                                  | instrument would engage the child's entire body, like in running and jumping                                                                                                                     | √      |
|                                  | The design should turn the complicated activities into simple ones                                                                                                                               | √      |
| 2. Kids Mayumi Kindergarten      | The playgrounds should be designed in a way to facilitate the child's planning for getting involved in an activity.                                                                              | √      |
Aspects

| Points                                                                 | Rating |
|-----------------------------------------------------------------------|--------|
| designing instruments for the playgrounds that resemble the grownups' world. | √      |
| design should be such that the children would be able to express their opinions in choosing the games they wish to play. | √      |
| The games should have rules and be designed in accordance with certain logic. | √      |

**Improving social skills**

| Points                                                                 | Rating |
|-----------------------------------------------------------------------|--------|
| facilitate cooperation among a group of children without creating nuisance for the others. | √      |
| instruments for the children in higher age groups and those for group games of younger children. | √      |
| should provide the possibility of grownups' participation so that the children would also learn how to interact with them more effectively. | √      |

| Points                                                                 | Rating |
|-----------------------------------------------------------------------|--------|
| There should be spaces within the playgrounds aimed at improving their touching skills, such as sand boxes and areas for playing with water. | √      |
| Designing instruments that generate noises and music can improve the child's hearing capability. | √      |
| The colours used in designs should have high contrast and be comprised of a harmonizing combination of various colours. | √      |
| The designs should improve the children's capability to achieve individual success. | √      |
| designs should be in a way not to decrease the child's concentration while playing. | √      |
| should be designed in a way to match the demands of such a varied group of users. | √      |

**Improvement of affective and emotional skills**

| Points                                                                 | Rating |
|-----------------------------------------------------------------------|--------|
| Should be in a way to ensure the child's freedom of movement          | √      |
| instrument would engage the child's entire body, like in running and jumping | √      |

### 3. Kinderfield Kindergarten

**Table 4. Comparative result for Kinderfield Kindergarten**

| Aspect                    | Point                                                                 | Rating |
|---------------------------|-----------------------------------------------------------------------|--------|
| Improvement motor skills  | Should be in a way to ensure the child's freedom of movement         | √      |
|                           | instrument would engage the child's entire body, like in running and jumping | √      |
| Aspect | Point | Rating |
|--------|-------|--------|
|        |       | Appropriate | Not Appropriate | Info. |
|        | The design should turn the complicated activities into simple ones. | √ | |
| Improving cognitive skills | The playgrounds should be designed in a way to facilitate the child's planning for getting involved in an activity. | √ | |
| | designing instruments for the playgrounds that resemble the grownups' world. | √ | |
| | design should be such that the children would be able to express their opinions in choosing the games they wish to play. | √ | |
| | The games should have rules and be designed in accordance with certain logic. | √ | |
| Improving social skills | facilitate cooperation among a group of children without creating nuisance for the others. | √ | |
| | instruments for the children in higher age groups and those for group games of younger children. | √ | |
| | should provide the possibility of grownups' participation so that the children would also learn how to interact with them more effectively. | √ | |
| Improvement of affective and emotional skills | There should be spaces within the playgrounds aimed at improving their touching skills, such as sand boxes and areas for playing with water. | √ | |
| | Designing instruments that generate noises and music can improve the child's hearing capability. | √ | |
| | The colours used in designs should have high contrast and be comprised of a harmonizing combination of various colours. | √ | |
| | The designs should improve the children's capability to achieve individual success. | √ | |
| | designs should be in a way not to decrease the child's concentration while playing. | √ | |
| | should be designed in a way to match the demands of such a varied group of users. | √ | |

The results of observations from three kindergarten schools from abroad and in the country namely KO Kindergarten, Kids Mayumi Kindergarten and kindergartens in Jakarta namely TK Kinderfield, the results of analysis of kindergartens that are abroad almost meet all the points indicators as a reference for the Interactive Playground approach while kindergarten Kinderfield kindergarten has not sufficiently fulfilled all aspects of these indicator points.
3.2 Interactive Playground mass analysis

Table 5. First form of design playground

| IMPROVEMENT MOTOR SKILLS | IMPROVE COGNITIVE SKILLS | IMPROVING SOCIAL SKILLS | IMPROVEMENT AFFECTIVE AND EMOTIONAL SKILLS |
|--------------------------|--------------------------|-------------------------|--------------------------------------------|
| A1                       | B1                       | C1                      | D1                                         |
| A2                       | B2                       | C2                      | D2                                         |

The results of the analysis of several formations in accordance with the 4 main points of the indicator produce some initial formations of the Interactive Playground. From each of these points it can be concluded that several sub points from each of these points can be translated into each of the 2 forms of play.

3.2.1 Mass form 1

Table 6. Mass form 1

Cluster Space

From each of these forms the game is applied into spatial form. Each formation of the 4 points results in a cluster form. Of the several forms of the game that can be applied into the mass of the building is in the square form.
### 3.2.2 Mass form 2

**Table 7. Mass form 2**

| A2 | B2 | C2 | D2 |
|----|----|----|----|

Centralized Space

From each of these forms, the game is applied into spatial form. Each formation of the 4 points results in the form of Centralized Space. Of the several forms of the game that can be applied into the form of building mass into 2 central points, namely playgrounds that focus on indoors and focus on outdoors.

### 3.2.3 Mass form 3

**Table 8. Mass form 3**

| A2 | B2 | C2 | D1 |
|----|----|----|----|

Radial Space

From each of these forms, the game is applied in the Radial form. Each of the formation of the 4 points produces a radial form where the formation can support the infinite motion activities carried out by children, which basically can support the activities of children who are active in playing and learning.
4. Concluding Remarks

The conclusion of this study based on the research and the analysis that has been done, it can be seen what needs are in kindergarten with the application of Interactive Playground based on the indicator points contained in the journal. From the analysis also found that children more often use the playground area among other room functions. Therefore classrooms must have a wide area to implement the Interactive Playground function, from the results of comparative studies from several kindergarten schools from domestic and abroad that classrooms and other facilities require different spaces compared to most park schools children in Indonesia, especially in Jakarta.

References

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