



Collaborative Game Activities to Stimulate Early Childhood Visual-Spatial and Kinesthetic Intelligence

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Abstract : Every early childhood has multiple intelligences that exist in the child. Visual-spatial and kinesthetic intelligence is intelligence that is very much needed in children's daily lives, but these two bits of intelligence are rarely collaborated to be stimulated in the same activity, based on this study children are stimulated simultaneously. The data from this study were then tested to see how much influence these activities had quantitatively. It was found that visual-spatial intelligence became a supporter in children doing children's movement activities, but it was also found in some children who only tended to focus on the patterns given in the concept of spatial visual stimulation.

Keywords: Children, Intelligence, Kinesthetic, Visual-Spatial

INTRODUCTION

Early childhood has unique characteristics because they are in a very rapid and fundamental process of growth and development for the next life. Psychologically, early childhood has the characteristics of behaviour, learning style and intelligence children have. Early age is the most important and fundamental early period in the span of growth and development of human life (Chad-Friedman, E., Botdorf, M., Riggins, T., & Dougherty, L. R.: 2021). One of the most important periods at this time is the golden age. Many concepts and facts were found to provide the potential for early childhood, that the potential possessed by early childhood is growing rapidly, early childhood is a period of exploration, a period of sensitivity and a period of play (Sumner, E.S.: 2020). . Every child has potential that can be developed. This potential is expected to be gradual according to the age and development of the child. Therefore, to develop the potential and intelligence of children, we can understand the term multiple intelligences.

Early childhood education provides efforts to stimulate, guide, hone, and provide activities that produce children's abilities and skills. Early childhood education is education given to children from birth to the age of six. Following the uniqueness and growth of early childhood, the implementation of early childhood education is adjusted to the stages of development that are passed during early childhood (Vogt, F., Hauser, B., Stebler, R., Rechsteiner, K., & Urech, C.: 2018). Early childhood education plays a very important and decisive role in the history of subsequent child development because it is the foundation for the basis of the child's personality. Children who receive appropriate and effective guidance from an early age will be able to improve their physical and mental health and well-being (Hedges, H., & Cooper, M.:

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2018), which will have an impact on increasing learning achievement, work ethic, and productivity so that they can independent and optimize their potential.

Intelligence in each child has a type of intelligence of each. Multiple intelligences (multiple intelligences) is an assessment that is seen descriptively how individuals use their intelligence to solve problems and produce something (Stănescu, M., & Tomescu, G.: 2021). This approach is a tool used to see the human mind operating in its environment, whether it is related to concrete or abstract objects. For Gardner (Cavas, B., & Cavas, P.: 2020) no one is stupid or smart there is a child who excels in one or several bits of intelligence. Visual-spatial and kinesthetic intelligence are bits of intelligence that are often used by children in carrying out daily activities (Klim-Klimaszewska, A.: 2021). Through visual-spatial intelligence, children are helped by patterns, shapes, directions and spaces that children encounter around them. Likewise, with kinesthetic intelligence, children need the role of kinesthetic intelligence in their daily activities. This is what makes it easy for children to engage in activities related to children's motor activities (Laely & Yudi: 2018).

Visual-spatial intelligence in an individual is related to the ability to form a model in mind about spatial and the ability to use the model in the real world (Sener, S., & okçaliskan, A.: 2018). This visual-spatial intelligence includes the ability to see precisely the visual images around it and pay attention to small details that most other people don't pay attention to (Rahmatunnisa, D. S. S., & Fauziah, M. B.: 2019). This shows that individuals who have visual-spatial intelligence have a great perception.

This ability allows children to be able to present spatial visual images in more detail, what is thought and imagined in the form of depictions or imagination in their thoughts which can then be poured into visual form (Montoya, M. F., Susperreguy, M. I., Dinarte, L., Morrison, F. J., San Martin, E., Rojas-Barahona, C. A., & Förster, C. E.: 2019). Children with spatial-visual intelligence have sensitivity to line, colour, shape, space, balance, shadow, harmony, pattern and relationship of elements of spatial visual intelligence based on visual acuity and security accuracy.

The ability to be able to understand images and elements such as lines and colours is a distinctive ability of visual-spatial intelligence (Baritz, M. I.: 2018). So from this explanation, the notion of spatial visual intelligence can be summed up into three keywords, namely: Visual-spatial intelligence enables children to perceive, capture and understand things through the five senses, and spatial visuals are related to the ability of the eye, especially colour and space, and spatial visual intelligence enables children to transform what the eye catches into other forms, for example looking at sunflowers, recording, imagination and then pouring it into pictures, doodles, paintings, blocks or legos and others.

All intelligence has a special location in the human brain. Visual-spatial intelligence is located in the right hemisphere of the brain, the occipital lobe. This part of the brain is the primary visual centre (visual acuity and satisfaction), but it also functions to recognize shapes, recognize line positions, the ability to see colours and identify the position of motion of an object (Oberer, N., Gashaj, V., & Roebers, C. M.: 2018). Space visual intelligence is a set of abilities related to selection, understanding, visual projection, mental imagination, spatial understanding, manipulation of images and doubling of real imagination and imagination in the self/abstract. Visual-spatial intelligence appears in children when children show interest in something, begin to pay attention to their preferences in colours, shapes, spaces and objects or

maybe when children understand more easily through pictures and not words when reading. Children who have high spatial-visual intelligence can be identified by the following characteristics:

1. Children love to play with shapes and spaces (design)
2. Memorize the road that has been passed
3. Actively working on related matters
4. With space abstraction
5. Have a good problem-solving or problem solving power
6. Happy to measure which is longer and shorter, big and small, far and near
7. Can capture approximation or distance
8. Children are imaginative and have high creativity
9. Children who have visual-spatial intelligence will find it easier to move.

Visual-spatial intelligent children have certain characteristics that distinguish them from other bits of intelligence. Children have the sensitivity to observe and think in pictures. Visual-spatial intelligence appears when children show interest in something, begin to pay attention to their preferences in the world related to colours, shapes, spaces and objects or maybe when children understand things more easily through pictures and not words when reading (White, A. L., Boynton, 2003). G. M., & Yeatman, J. D.: 2019). Children who have high spatial-visual intelligence have characteristics, including (1) love to play with shapes and spaces (design and build); (2) memorize the roads that have been passed; (3) actively working on things related to space abstraction; (4) have good problem solving or problem-solving power; (5) likes to measure which is longer and shorter, big and small, far and near; (6) can capture approximations or distances; and (7) have high attention to detail. Children's visual intelligence can be developed in several ways, namely: (1) doodling; (2) drawing and painting; (3) making crafts or crafts that require children to manipulate materials; (4) visiting various places to enrich children's visual experience; (5) playing constructive and creative games; and (6) organize and design by inviting him to organize space activities at home (Sujiono, 2005).

Visual-spatial intelligence is a person's sensitivity to colours, lines, and shapes. Stimulation of children's learning methods that can improve their visual-spatial intelligence can be done through building techniques, colouring, combining colours, playing with imagination, mapping thoughts, observing shapes, drawing and arranging. A person's ability to imagine an object, and generate ideas visually (in the form of images or forms that are visible).

Program materials in the curriculum include videos, and pictures, using models or diagrams. Visual-spatial intelligence is an intelligence that is associated with the talent for painting or architecture. Visual-spatial intelligence must be stimulated properly, otherwise, visual-spatial intelligence will not develop optimally. Visual-spatial intelligence can be stimulated through various programs such as painting, drawing using a paint program, forming things with

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plasticine, stamping and arranging pieces of paper into picture shapes (Setiawan, R., Mardapi, D., & Karyanto, U. B.: 2020).

This is also the kinesthetic intelligence that children have. Kinesthetic intelligence or physical intelligence is an intelligence where when using it a person is able or skilled to use his limbs to perform movements such as running, dancing, building things, doing artistic activities, and works of art. In this case, kinesthetic intelligence is defined as a person's ability to use his limbs to move. Kinesthetic intelligence is the development of the elements of maturity and body movement control. There is still a lack of early childhood in developing body movements through singing, harmonizing mind and body (body coordination), developing agility, strength and body balance and coordinating eyes with hands and feet (Beardall, N., & Furcron, C.: 2019).). Children aged 5-6 years can perform symbolic movements.

Children who have this intelligence can use their whole body, or at least part of their body to solve problems, which is a development of kinesthetic intelligence. Kinesthetic intelligence is the ability to use all parts of the body physically such as using the hands, fingers, arms and various other physical activities in solving problems, making things, or producing various kinds of products.

The capacity to use your whole body or parts of your body-your hands, your fingers and your arms to solve a problem, make something, or put on some kind of production. The most evident examples are people in athletics or the performing arts, particularly dance or acting. Kinesthetic intelligence is the ability to use the hands, fingers, arms, and various other physical activities in solving problems, making things, or producing products. Examples that appear to be observed are activities that accompany athletes or in performing arts such as dancing or acting.

Kinesthetic intelligence or physical intelligence is an intelligence where when using it a person is able or skilled in using his limbs to perform movements such as running, dancing, building things, performing artistic activities or works of art (Abdullah, M., Ahad, A., & Aslam, M, M. : 2019). The core components of kinesthetic intelligence are specific physical abilities, such as coordination, balance, skill, strength, flexibility and speed as well as the ability to receive stimuli (proprioceptive) related to touch (tactile and haptic). Based on the description of the theory that has been stated above, it can be concluded that kinesthetic intelligence is the ability to use the limbs in solving problems to express ideas, ideas that are shown through practice so that goals can be achieved such as running, dancing, jumping and so on.

RESEARCH METHODS

The research carried out in this study carried out experimental research using quantitative data. The sample used in this game activity invites children aged 5-6 years totaling fifty children. The researcher was assisted by four teachers in the implementation of the game.

Research activities are given to children using the principles of early childhood learning. Researchers observed behavior that appeared in children based on indicators of visual and kinesthetic intelligence used in this study. In visual-spatial intelligence, researchers use several indicators. In color sensitivity assessment, recognizes different shapes, different directions, likes to explore directions and enjoys activities with colored tools. In kinesthetic intelligence, researchers use several indicators, namely indicators of kinesthetic intelligence which are

improved through play activities, namely coordination, balance, dexterity, strength, flexibility and speed.

The data obtained based on the behavior that appears in children when carrying out the game is analyzed by looking at the average to see how much influence the activity has by collaborating the two intelligences simultaneously.

RESEARCH RESULT

Implementation of research using games that collaborate activities under the indicators of visual-spatial and kinesthetic intelligence. Children show good enthusiasm for participating in in-game activities. In doing the game, the children show their respective behaviour during the activity.

Table 1. Visual-Spatial Intelligence

Color Sensitivity		Recognize Different Shapes		Direction Difference		Enjoy to Explore Directions		Enjoy Activities With Colored Tools	
Std Error	0,06	Std Error	0,07	Std Error	0,07	StdError	0,07	Std Error	0,07
Mean	3.47	Mean	3.44	Mean	3.45	Mean	3.47	Mean	3.46
Median	3,65	Median	3	Median	3,25	Median	3,4	Median	3
Mode	3	Mode	3	Mode	3	Mode	3	Mode	3
Standard Deviation	0,47	Standard Deviation	0,47	Standard Deviation	0,47	Standard Deviation	0,48	Standard Deviation	0,48
Range	1	Range	1	Range	1	Range	1	Range	1
Minimum	3	Minimum	3	Minimum	3	Minimum	3	Minimum	3
Maximum	4	Maximum	4	Maximum	4	Maximum	4	Maximum	4
Sum	173,9	Sum	172,3	Sum	172,7	Sum	173,6	Sum	172,8
Count	50	Count	50	Count	50	Count	50	Count	50

Based on the data in Table 1 relating to children's visual-spatial intelligence, it was found that the average value (Mean) in the table for each indicator was above 3.40. It can be stated that the role of using games that collaborate visual-spatial intelligence with kinesthetic intelligence can be stated to stimulate intelligence well. This is seen from the Likert scale of the child's assessment that the value of 3 indicates a good meaning. Apart from that, the regression model used in this data analysis can be said to be feasible and significant. This can be seen from the standard error (std error) in table 1 which is less than the standard deviation value.

Tabel 2. Kecerdasan Kinestetik

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Coordination		Balance		Dexterity		Strength		Flexibility		Speed	
Mean	3,44	Mean	3,41	Mean	3,46	Mean	3,47	Mean	3,49	Mean	3,63
Std Error	0,07	Std Error	0,07	Std Error	0,07	Std Error	0,07	Std Error	0,07	Std Error	0,06
Median	3	Median	3	Median	3,4	Median	3,4	Median	3,8	Median	3,9
Mode	3	Mode	3	Mode	3	Mode	3	Mode	3	Mode	4
Standard Deviation	0,47	Standard Deviation	0,48	Standard Deviation	0,47	Standard Deviation	0,48	Standard Deviation	0,48	Standard Deviation	0,46
Range	1	Range	1	Range	1	Range	1	Range	1	Range	1
Minimum	3	Minimum	3	Minimum	3	Minimum	3	Minimum	3	Minimum	3
Maximum	4	Maximum	4	Maximum	4	Maximum	4	Maximum	4	Maximum	4
Sum	172,1	Sum	170,8	Sum	173,2	Sum	173,6	Sum	174,6	Sum	181,4
Count	50	Count	50	Count	50	Count	50	Count	50	Count	50

Based on the data in Table 2 related to the child's kinesthetic intelligence, it was found that the average value (Mean) in the table for each indicator was above 3.40. On the speed rating points occupy the highest score. It can be stated that the role of using games that collaborate visual-spatial intelligence with kinesthetic intelligence can be stated to stimulate intelligence well. This is seen from the Likert scale of the child's assessment that the value of 3 indicates a good meaning. Apart from that, the regression model used in this data analysis can be said to be feasible and significant. This can be seen from the standard error (std error) in table 1 which is less than the standard deviation value.

DISCUSSION

Children carrying out game activities feel happy and enthusiastic. Activities that stimulate each child's intelligence provide space for children to able to further optimize their child's intelligence. The kinesthetic intelligence that children have makes it easier for children to carry out activities (Mohamed, K. T.: 2022). Children can move without any visible hesitation, although some children still need reinforcement from the teacher. Children can jump, walk, tiptoe and do other kinesthetic activities.

The visual-spatial intelligence that children have becomes the initial capital for themselves to be more sensitive to the shapes, patterns and colours used in in-game devices. Apart from that, when it is coordinated with the motion used to adjust the pattern of space used when playing, children are easy follow every command that has been set in the game.

Based on the data in Tables 1 and 2, the children's ability in visual-spatial and kinesthetic intelligence can be optimally optimized in activities that collaborate with the two bits of intelligence. Teachers play a very important role in the success of children's development

achievements. Learning devices that use primary and contrasting colours make it easier for children to identify shapes and colours that are used as references for children in moving.

Behind the children who are easy to carry out the game, some children experience confusion in coordinating movements. This is because the child does not focus on doing the concept of thinking, whether to remember the concept of a pattern or regulate the movement. Children who experience this situation can be interpreted personally the child is not too dominant in their visual-spatial intelligence or kinesthetic intelligence.

The problems that arise in the implementation of the research become important findings to be reviewed further. So that every child gets equal stimulation given according to the characteristics and needs of the child in every process of growth and development.

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