Development of a Motor Physical Activity Game Model to Improve Self-Control and Memory of Children with Visual Impairment in Special Schools (SLB)

Bernadeta Suhartini[1], Rachmah Laksmi Ambardini[2], Panggung Sutapa[3], Sumaryanti Sumaryanti[4]

[1234]Universitas Negeri Yogyakarta, Colombo St. No. 1 Yogyakarta, Indonesia
bernedeta_suhartini@uny.ac.id

Abstract. Research to produce products in the form of motor physical activity game models in accordance with the characteristics of student conditions, whose implementation is easy, cheap, fun and safe and effective to improve self-control and memory of children with intellectual disabilities. The development model uses Borg and Gall. The empirical validation test used 30 students with intellectual disabilities and a large-scale trial of 49 children with intellectual disabilities at SLB Marsudi Putra I Bantul. Design product game trials using *Expert Judgemet* which produced a motor physical activity game model for students with intellectual disabilities namely; (1) sprint to pick up color balls on command, (2) jump over cons according to color, (3) install number pazels, (4) throw balls into circles, (5) crawl in Holahop tunnels. Data analysis techniques use quantitative and qualitative discriptive, and for product refinement and model feasibility using Data analysis *Anova General Multifariat.*. Data collection was obtained through mototic physical activity, research instruments in the form of tests *Stroop Calor Word* (the child mentions the color of the number instead of the number), to measure self-control and memory is measured using the Wopdcoch Johson III Cognitive Buttery test (the child sees and names 3 numbers randomly and repeats without looking). The results obtained that a motor physical activity game model has been developed to improve (1) running fast to pick up color balls according to orders, (2) jumping over cons according to color, (3) installing number pazels, (4) throwing balls into circles, (5) crawling in Holahop tunnels.
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Keywords: Motor activity game model, concentration, self-control, memory, children with intellectual disabilities.

1 Introduction

Children with intellectual disabilities are complex conditions, have low intellectual abilities and experience behavioral movement barriers. Characteristics of children with intellectual disabilities include low intellectual development and difficulties in adaptive behavior. The term adaptive behavior is defined as a person's ability to assu-

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me social responsibilities according to certain measures of social norms and is conditional according to the stage of development. Barriers in adaptive behavior in the mentally impaired can be seen in seven areas, namely: a) inhibited in the development of sensorimotor skills, b) inhibited in communication skills, c) inhibited in self-help skills, d) inhibited in socialization, e) inhibited in 10 applying academic skills in daily life, f) inhibited in assessing environmental situations appropriately and g) inhibited in assessing social skills [1]. The categories of children with intellectual disabilities vary, some are accompanied by color blindness, accompanied by dwarf bodies, accompanied by long heads, accompanied by certain body odors, but some are not accompanied by anything. They all have something in common, namely less intelligent and inhibited in adjusting to the environment when compared to their peers. Based on some of the definitions above, it can be concluded that the mentally impaired are children who have intelligence below average, experience difficulties in communication and social, occur during the period of motor development, experience retardation in adjusting to the environment, are less proficient in thinking abstract things, require special education services and these conditions cannot be cured. In addition to the above characteristics, children with intellectual disabilities have weak memory and concentration. Children with intellectual disabilities are individuals who have significantly below average intelligence and are accompanied by disabilities in behavioral adaptation that arise during development and abnormalities that show obstacles in adaptive behavior. Children with intellectual disabilities experience many disturbances in concentration, although not all children with intellectual disabilities experience it.

Children with intellectual disabilities are children who have intelligence abilities below average. The ability of intelligence below average is one of the causes of children with intellectual disabilities experiencing impairment in concentration and low memory and self-control. Control and memory skills refer to the ability of students at the time of remembering commands and self-control that must be done and in paying attention to lessons in the learning process. Helping to improve memory and self-control of children with intellectual disabilities can be done with a game. One of the games to improve the control and memory of children with intellectual disabilities is done with games that involve children's motor fisk. Researchers are interested in making motor physical activity models that are fun and in accordance with the needs of children with special needs, namely children with intellectual disabilities. There is a close relationship between memory (memory work) and self-control, memory (memory work) is a limited capacity system, while time can maintain and improve information and support human thought processes [2]. Often memory becomes the basis or important point for the regulation of cognitive processes. Based on Badlley's model of thinking [2] memory has three basic components, namely, the central executive system and two additional storage systems, one for sketching *phonology* and another for sketches *visuospatial.* Such additional systems are responsible for the temporary storage of verbal and non-verbal information. The central executive system processes information on memory, Barkley [3] Serino [4] stated that in the early stages of problem solving and purposeful behavior, memory plays an important role, memory and self-control provide storage space and work space for information, carry out information processing on memory, so that information is used efficiently. As long as the tasks of memory and self-control involve purposeful behavior, the memory system, be it ver-

bal or nonverbal, must be robust to enable the executive system to determine the best strategy with a set of appropriate alternatives, which are well thought out and can be modified, when necessary [5].

Children with special needs (ABK) have symptoms of difficulty in self-control in moving, easily forget about their daily activities, children are impulsive, and hyperactive [6]. The behavior of children with special needs can occur anywhere, for example at home, at school or in other public places. Even when learning, children cannot focus on their lessons and perform impulsive actions. In addition, in the teaching and learning process, ABK, especially children with intellectual disabilities (ATG) get bored faster, find it difficult to catch the lessons given by the teacher, and sleepy. This fact shows the disinterest of students because their learning needs are not met properly so that improvements must always be made in classroom learning practices [7] Children with intellectual disabilities have the same level of intelligence as grade 4 elementary school students, so in this study adjusted to the stage of motor development of grade 1 to grade 4 students, namely using motor physical activity games more directed at gross motor To see whether or not there is self-control and memory of Truna Grahita's child [8]. The purpose of the study was to develop motor activity games using gross motor activities to improve self-control and memory of children with intellectual disabilities at SLB Marsudi Putra Bantul, Yogyakarta, Research instruments in the form of tests *Stroop Calor Word* (children say color numbers instead of numbers) to measure self-control and memory measured using and Wopdcoch Johson III Cognitive Buttery test (children see and name 3 numbers randomly and repeat without looking) [9].

2 Method

Development of a motor physical activity game model to improve self-control and memory of children with intellectual disabilities to produce products that can be used in learning physical activity in children with disabilities. The game model is adapted to the characteristics of children who have the nature of easy to do, interesting, safe and cheap.

The development model uses the research and development model developed by Borg and Gall [10] which includes: 1) The initial research stage and data collection, this activity is by making observations in the field, 2) The planning stage, which is identifying physical activity learning in Marsudi Putra I Yogyakarta special schools, 3) Developing instrument models validated by experts with techniques *Delphi* 4) Small-scale field test, 5) Product Revision, revise the model product according to input from experts, 6) Wide-scale test, 7) Dissemination of motor physical activity game model product as the final stage.

2.1 Study Design

The research design used in this study is descriptive research. The research method used is a survey method, with data collection using test techniques.

2.2 Research Participants

The population used in this study was all students with intellectual disabilities Marsudi Putra I Bantul Yogyakarta, totaling 79 children, aged 9 – 16 years. The sample used in this study was 79 children, this study was a population study.

2.3 Data Collection and Instrumentation

The initial instrument of development carried out observations in the field to obtain data in accordance with the analysis of needs in accordance with children with intellectual disabilities with questionnaire instruments and using Expert Judment by technique Delphi. The motor physical activity game model includes: (1) sprinting to pick up the color ball on command, (2) jumping over the con according to color, (3) installing number pazels, (4) throwing the ball into the circle, (5) crawling in the Holahop tunnel.The data collection technique in this study is to use a test that can directly know the results of the implementation of the test.

2.4 Statistical Analysis

This research uses Multifariate General Anova data analysis.

3 Result

3.1 Material Expert Validation Results.

The feasibility assessment of expert validation is 3 SLB teachers and one motor development expert lecturer assessing motor physical activity games to improve control and memory of children with intellectual disabilities. The aspects assessed were 6 motor physical activity games and each aspect had 4 assessment categories, namely: 1) very bad, 2) not good, 3) good, and 4) very good. Summary of expert validation test results can be seen in table 1.

Table 1. Summary of Assessment 4 Expert validation on motor physical activity games to improve self-control and memory of children with intellectual disabilities

No	N (Member)	Shoes Max	Jml	Percent (%)
1	4	16	14	87,50
2	4	16	15	93,76
3	4	16	13	81,26
4	4	16	14	87,50
5	4	16	15	93,76
Total	4	80	71	88,75

Based on the results of experts or validators that motor physical activity games to improve self-control and memory of children with disabilities are worth using.

3.2 Empirical validation test results

Validity testing is carried out by correlating the score of observation items and total scores, correlation tests with tests between raters using data analysis Anova General Multifariat. The results of the validity test of the motor physical activity game model are explained as follows;

3.3 Test results of validity test of motor physical activity game model

The results of the calculation of the correlation coefficient between rater data for limited-scale trials of the game model instrument of motor physical activity 1 on aspects of self-control and memory are as follows:

Table 2. Validity Test Results of the motor physical activity game model on self-control and memory

No	Aspects	Rater Score	Correlation Coefficient	p itself	Status
1	Self-control	Rater 1 – Skor total rater	0,862	0,000	Valid
		Rater 2 – Skor total rater	0,852	0,000	Valid
		Rater 3 – Skor total rater	0,712	0,000	Valid
		Rater 4- Skor Total rater	0,716	0,000	Valid
2	Memory	Rater 1 – Skor total rater	0,979	0,000	Valid
		Rater 2 – Skor total rater	0,962	0,000	Valid
		Rater 3 – Skor total rater	0,970	0,000	Valid
		Rater 4 - Skor total rater	0,856	0,000	Valid

3.4 Inter-Rater Reliability Test Results

Inter-rater reliability test using correlation coefficient test using *Alpha coefficient,* with analysis *Anova-General Multifaced,* The model shows the value of the high inter-rater coefficient as the table 3.

Table 3. Reliability Test Results of motor physical activity games

No	Aspects	Coefficient	Coefficients between raters	Status
1	Self-control	0,883	0,908	Reliable
2	Memory	0,847	0,907	Reliable

3.5 Product Trial Results

Results of limited-scale trials

Data from expert opinions after carrying out motor physical activity games on the Limited Scale trial (30 kindergarten students) using 6 motor physical activity games, self-control and memory materials on the Limited Scale are shown in the table 4.

Table 4. Results of the implementation of the motor physical activity game model of a limited-scale field trial

			Repetition I (R1)		Repetition II (R2)		Repetition III (R3)		Increased		
Games activity physical motor	N	Shoes Max	Jml	Percent (%)	Jml	Percent (%)	Jml	Percent (%)	R1-R2 (%)	R2-R3 (%)	R1-R3 (%)
Self-control	30	120	81	67,50	95	79,17	102	85,00	11,67	5,83	17,50
Memory	30	120	85	70,83	93	77,50	100	83,33	6,67	5,83	12,50

Based on the results of table 4 above, the percentage calculation results in the aspect of self-control aspect of rep one by 67.50%, increased in rep two, which was 79.17%, and even increased in the third rep by 85.0%. The memory aspect of rep one by 70.83% increase in rep two at 77.50%, and even increased in the third rep by 83.33%.

In the aspect of self-control, the increase from rep one to rep two was 11.67%, for reps two to rep three increased by 5.83%, while the increase in rep one to rep three was 17.50%. Starting from rep one to rep two and rep three always increases. In the aspect of thinking power, the increase from rep one to rep two was 6.67%, for reps two to rep three increased by 5.83%, while the increase in reps one to the third rep was 12.50%. Starting from rep one to rep two has increased, for reps two to rep three has increased, from rep one to rep three has also increased.

The results of the calculation of the percentage of self-control and memory of children with intellectual disabilities have increased in each repetition, it can be concluded that the game model of motor physical activity is reviewed from aspects of self-control, and aspects of thinking power in accordance with the characteristics of children with intellectual disabilities and in accordance with basic competencies.

Results of wide-scale trials

Data on the opinions of teachers after carrying out APM learning on a Broad Scale trial (49 children with intellectual disabilities) using games, physical activity, motor,

self-control material and memory of children with intellectual disabilities on a Broad Scale are shown in the table 5.

Table 5. Results of the Implementation of the Motor Physical Activity Game Model to Improve Self-Control and Memory Broad Scale Test

			Repetition I (R1)		Repetition II (R2)		Repetition III (R3)		Increased		
Motor physical activity games	N	Score Max	To-tal	Per-cent (%)	Total	Percent (%)	Total	Per-cent (%)	R1-R2 (%)	R2-R3 (%)	R2-R3 (%)
Self-Con-trol	49	196	177	75,00	227	96,19	235	99,58	21,19	3,39	24,58
Memory	49	196	171	72,46	226	95,76	235	99,58	23,31	3,81	27,12

Based on the results of table 5 above, the calculation of the percentage in the aspect of self-control of rep one by 75.00% increased in rep two, which was 96.19%, and even increased in the third rep by 99.58%. The memory aspect of rep one by 72.46% increased in rep two by 95.76%, and even increased in the third rep by 99.58%.

In the aspect of self-control, the increase from rep one to rep two was 21.19%, for reps two to rep three increased by 3.39%, while the increase in rep one to rep three was 24.58%. Starting from rep one to rep two and rep three always increases. In the aspect of memory, the increase from rep one to rep two was 23.31%, for reps two to rep three increased by 3.81%, while the increase in reps one to the third rep was 27.12%. Starting from rep one to rep two has increased, for reps two to rep three has increased, from rep one to rep three has also increased.

4 Discussions

The percentage of self-control and memory of children with intellectual disabilities has increased in each repetition, so it can be concluded that the game model of motor physical activity in terms of self-control, and aspects of thinking power in accordance with the characteristics of children with intellectual disabilities and in accordance with basic competencies in terms of implementation are safe, easy, happy, and useful.

Children with intellectual disabilities (ATG) get bored faster, find it difficult to grasp the explanation given, and tend to be hyperactive in accordance with the opinion [7]. Facts show that with the motor physical activity model of children with intellectual disabilities there is an interest in doing the game. The learning needs of children with intellectual disabilities are often not met properly so that improvements must always be made in learning practices in the classroom Children with intellectual disabilities who have the same level of intelligence as elementary school students grade 4, so in this study adjusted to the stage of motor development of grade 1 to grade 4 students, namely using motor physical activity games more directed at gross

motor to see the presence or absence of control The motor physical activity game model for children with intellectual disabilities is produced in substance models developed according to the characteristics of children with intellectual disabilities, the non-verbal verbal language used is easy to understand and clear, the game model is made interesting, the movements used are quite fun, motion safety is quite safe for children with intellectual disabilities and cheap. The game model of motor physical activity can be done by children with intellectual disabilities and can stimulate memory (memory work), this is in accordance with the opinion of Badlley [2], namely that an interesting game, while maintaining and improving information and supporting human thought processes.

New findings from the results of the study entitled "The model of motor physical game activity to improve self-control and thinking power of children with intellectual disabilities is to train self-control and train memory in following learning and communicating with others, because models in the form of simple games can stimulate movement responses, excitement, self-control and improve memory of children with intellectual disabilities.

5 Conclusion

The Develop a motor physical activity game model consisting of 1) sprint pick up color balls according to command, (2) skip con according to color, (3) installing number pazels, (4) throwing balls into hoops, (5) crawling in Holahop tunnels have been shown to improve self-control and memory of children with intellectual disabilities and have validated feasibility. Motor physical activity game model effective for improving self-control and memory of children with intellectual disabilities. Effectiveness can be seen from the difference in values Pretest and posttest after treatment with motor physical activity games. Based on the calculation of differences Pretest and posttest indicates that the average value posttest higher than average score pretest. The results of the category that were originally quite good or good increased to the good or very good category. Child feel happy or happy who ultimately want to do physical motor play activities without coercion.

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