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## IMPROVING BASIC MOVEMENTS AND HEALTH OF MENTALLY DISABLED STUDENTS THROUGH ADAPTIVE PHYSICAL ACTIVITIES

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### Abstract

The research aims at developing a learning model of adaptive physical activities (APA) for improving basic movements and health of mentally disabled students in a disabled elementary school at Bantul regency; therefore it is a research and development. There are 5 steps used by the researcher : a preliminary study, planning, expert validation, empirical validation and effectiveness testing. The small scale implementation testing was done to 13 disabled students whereas the large scale, 42 students of 3 graders of disabled elementary school. The effectiveness testing uses an experimental research within one pre and post test group. The group consists of 27 students of Plered Disabled Elementary School. The research observation instrument uses Likert scale and rating-scale. The proposed learning models are: Kid Komodo football, waves in the sea, knowing shapes, frog circus and air bubble. These models prove effective for mentally students of disabled elementary school. Both the small scale implementation testing and the large scale one result in the improvement of basic physical movements of the students. The secondary result is that teachers of physical education and health find the models easy to do and the students get fun being taught using them.

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## INTRODUCTION

Basic physical movements are needed by human in their life therefore physical education and health subject should consider them particularly for mentally disabled schools. It is a great achievement if a mentally disabled school can improve the basic physical movements of its students (BSNP, 2006: 130). Mentally disabled students have problems with their cognitive function, adaptive behavior, and emotion. They also have problems with their memory, they are usually slow learners, unable to focus their attention, and have low motivation. Their competence in adapting a new situation is also problematic, and so are their competence to communicate and to solve common problems.

Besides, the facts in the field show that good APA learning models can stimulate the brains of the mentally disabled students to improve their adaptive basic movements. The disabled students may have the above problems due so due to serious sickness which results in the dis-function of the brain.

According to Jean Blaydes, (2001:4) the adaptive physical activities will uniting motoric and cognitive parts of the brain, namely cerebellum, ganglia basalis, and korpuskalosum which can stimulate the production of neurotrophin which can increase the amount of sinapsis connection. Furthermore he states that the impact of sport or physical activities are the increase of the blood circulation; this causes individual's nervous system to get more oxygen and nutrient; being able to force NGF hormone to improve the brain function, the motoric repetition moveme to Soemarmo Markam (2005:4), the basic physical movements may bring about the improvement of the blood circulation to the brain. The improvement is followed by better breathing which means more oxygen will repair the brain function. Related to that, Dennison (2004:5) states that the intersection midline of a body can optimize the brain function. Based on them this research tries to improve the basic physical movement and optimize the function of the brain of mentally disabled students through the learning model which uses APA in the physical education subject.

The models are proposed since, the results of preliminary study tells that the factual conditions of the disabled elementary school when having physical education subject were so problematic: the learning did not stimulate them to have effective physical activities; the steps in learning was only considerably good; the technique used by the teacher was not interesting; teachers have

difficulties in learning because the teacher did not have any educational background in teaching physical education; the learning did not consider the use of the students' brain; no adaptive models were used.

As stated in the abstract the research purposes are : proposing APA as the model of learning for students of disabled elementary school, proving that APA model can be used to improve the basic physical movements of the students under study, and proving that APA is an effective model of physical education learning for the concerned students and at the same time optimizing the students' brain function.

## METHOD

The approach of this research is research and development. What is developed is a model called Adaptive Physical Activities. It adopt the four steps of the Reasearch and Development suggested by Borg and Gall (2003:772), namely: preliminary study, planning, validation, testing.

The bounded small scale testing and wide scale one are done using a pre-experimental research within a single shot case study design. The testing of the product effectiveness uses a pre-experimental research within one group pretest-posttest design.

The validation of the research are done by four experts: a sport education expert, an expert of adaptive physical education, a nerve system expert, a sport, health and therapy expert , a mentally disabled sport teachers, an expert of psychological of child development. The technique of selecting the subjects for testing the product is purposive sampling. The small scale testing uses 13 students of only a given grade of disabled elementary school whereas the large scale product testing uses 42 students from 3 different grades of a disabled elementary schools at Plered, Bantul Regency. The latter involves the first, second and third graders of the mentally disabled school.

The instrument for validation of the product by the experts uses questioners which focus on two factors : the product content which consists of adaptive model characteristics and basic competent indicators, and the product implementation which concerns on the easiness , safeness, students' fun, practicability, and usefulness of the model. The instrument for the effectiveness testing of the product is done with the Licker's scale and ratting scale.

The data analysis of the product validation is done qualitatively using percentages. Whereas

the effectiveness of APA model implementation is done quantitatively using statistical t-test formulae which takes into account the result of pre and post tests.

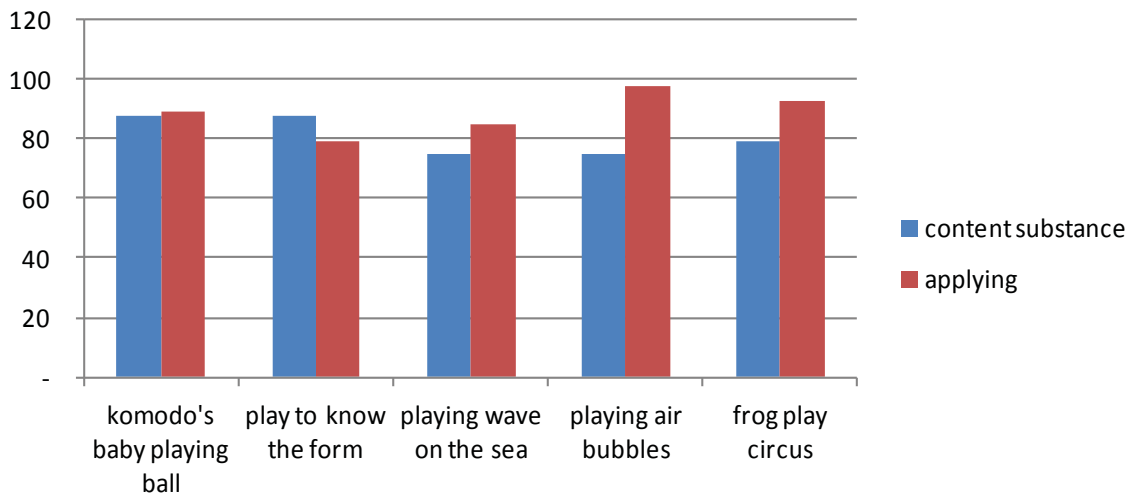
**RESULTS AND INTERPRETATIONS**

The study results in the forms of product are 5 APA models, namely Kid Komodo football, waves in the sea, knowing shapes, frog circus and air bubble.

The result of the content validity ratio (CVR) of the every model is 1 (one). This means the validity for the five products is 5, which implies that the proposed APA models respectively have a relatively high content validity and therefore it can be proceeded to the research next step—the empirical validation testing by implementing the 5 proposed APA models which are: Kid Komodo football, waves in the sea, knowing shapes, frog circus and air bubble. The first model—the

kid Komodo football model is the combination of basic upward creeping movements, two-hand crawling movements, and kneeling movements while crossing hands on the chest. The second model—the waves in the sea model is the combination of the basic right and left movements while the body is laying on the mat or right and left movements of the body while laying on the parachute mat. The third model – the knowing shape model is the combination of the basic movements of hands in various basic shapes, such as a triangle, a rectangle, a circle, etc. The frog circus model is the combination of basic jumping movements forward, sideward, and backward with a ball like animal aid. The fifth model – the air bubble model is the combination of basic throwing and, catching a balloon movements, and hitting the balloon using a racket.

Teachers' evaluation results of the models in the small scale testing in the model implementation stage are shown in the following table.



**Graph 1.** Results of the 5 models in terms of their adaptive content and effectiveness when implemented

According to graph 1 above, the evaluations are done towards the adaptivity of content of the models and their effectiveness respectively. The results of evaluation on kid Komodo's football are very good in both adaptive content (88% of the whole material) and its effectiveness when implemented (89% of the whole).

The evaluation on the waves in the sea model shows that 75% of the material is good and 85 % of this model material is very effective when implemented; these evaluations imply that this second APA model is good and applicable.

The knowing shapes model gains 85% good content of the whole material whereas the implementation of the model effectiveness is 85

% of. Therefore the knowing basic shapes model proves to be good.

The air bubble model has 75% adaptive content and when it is implemented 98% of the whole material is very effective. This indicates that this very model is very good and has nearly absolute effectiveness.

80% of the whole material of frog circus model has a good content and when it is implemented 95% of the whole is effective. Those indicators bring about the implication that this model is excellent.

Based on the interpretation of the research results, it can be inferred that the 5 models—APA learning models have more than considerably

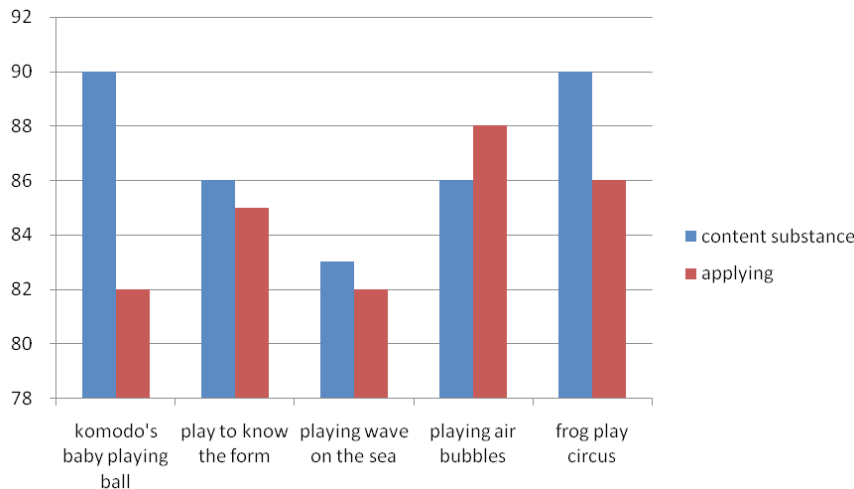
good content and effective when implemented. In other words that all the proposed APA models have good contents and when implemented they are easy to implement, provide fun to the students, the students are happy being taught in

these models; the models prove to be useful for teaching physical education.

The large scale testing results in the second implementation are shown in the table which follows.

**Table 1.** The results of the large scale model implementation

| Model                 | First testing -- second testing |       |           |                 |       |
|-----------------------|---------------------------------|-------|-----------|-----------------|-------|
|                       | Combining basic movement        |       | Happiness | Attention focus | Guess |
| Playing komodo's baby | 0.001                           | 0.002 | 0.025     | 0.001           | 0.005 |
| Play to know the form | 0.001                           | 0.002 | 0.008     | 0.003           | --    |
| Play wave on the sea  | 0.001                           | 0     | 0.001     | 0.002           | 0.01  |
| Playing air bubbles   | 0.003                           | 0.001 | 0.014     | 0.001           | --    |
| Frog play circus      | 0.001                           | 0     | 0         | 0.001           | --    |



**Table 3.** a large scaled testing results after implementing the five APA learning models

Based on the calculation of the first testing and second testing outside of area under study, the  $\alpha = 0.05$ , this calculation result indicates that there are significant differences between first testing result and second one ( $P < 0.05$ ). It, then, can be concluded that the APA five models of learning are effectively improve the results of student participation on their basic physical movements. The detailed results of the five APA learning models at a large scale are shown graph 2 below.

Based on the second graph above--the percentage calculation of five APA learning models, their content and the effectiveness after being implemented in a large scale are very good, the range is between 82% to 90%. So it can be concluded that five APA learning models' contents are very adaptive with student characteristic and competent.

The results of five APA learning models' effectiveness in improving the students' basic physical movement through their first material testing in the large scaled implementation and second one are shown by table 2.

Based on calculation, so the first testing and second testing wide scale five model was out of agreement area  $\alpha = 0.05$ , such that there is significant differences between first testing and second testing ( $P < 0.05$ ). so can be concluded that five models of learning was effective to increase studying result on student participants basic movement material and its happen with significant ( $P < 0.05$ ).

The bounded scale testing results of five APA learning models which are shown in the second table proves that the APA models have good/very good content and when they are implemented, the materials tend to be adaptive to

**Table 2.** Effectiveness testing results of APA learning model

| Model                 | First testing -- second testing |         |           |                 |       |
|-----------------------|---------------------------------|---------|-----------|-----------------|-------|
|                       | Combining basic movement        | respond | happiness | Attention focus | guess |
| Playing komodo's baby | 0.011                           | 0.014   | 0.008     | 0.014           | 0.014 |
| Play to know the form | 0.007                           | 0.014   | 0.014     | 0.025           | --    |
| Play wave on the sea  | 0.024                           | 0.025   | 0.007     | 0.046           | 0.025 |
| Playing air bubbles   | 0.01                            | 0.014   | 0.046     | 0.008           | --    |
| Frog play circus      | 0.01                            | 0.014   | 0.046     | 0.008           | --    |

the students' behaviors, safeness, responses, and they can make the students focus their attention better.

The results of the second implementation testing tend to be bigger than the first implementation results. It can be deduced that the five APA models are able to improve the basic physical movements of the disabled elementary schools students. At the same time they can optimize the students' brain function.

These coincide with Glenn's (2012; 350-351) theory which says that basic creeping movement can bring about creeping ability towards the students who formerly can not creep. This happens so in crawling hand and knee movement trainings.

These coincide with Orton, et al.'s statement (as cited in Dennison, 2004:6) that crossing feet and hands exercises can optimize the brain and Markam's (2005) suggestion which says that muscle training and the other moving exercises are able to optimize the brain and stimulate the cooperation between brain parts and the other body moving parts which at the same time improve the blood circulation to all brain parts. These results bring a better breathing since more oxygen will be obtained by the brain and at last it can improve the brain function. The same results are gained in the research introduced by Neman, R, et al. (1975: 1) on motoric sensory program pattern of mentally disabled kids and adults in term of their upward creeping,, crawling on hands and knees, and stimulate sensory working. The research explicitly increases the students' visual perception, mobility, and language ability.

For validity reason, the APA learning models are implemented in a large scale to different grades of disabled school at Bantul to find out the adaptivity of the materials toward the students' characteristics and to measure physical movement ability in optimizing the brain function

through the students' competence in responding , focusing attention, and guessing . The average results of the second test are higher than the ones of the first. This infers that the five APA models are effective to improve both the students' basic physical movement ability and their competence in optimizing the brain function.

To obtain the sound product, the implementation is done to first, second, and third graders of the 3 different mentally disabled schools. The results show a significant difference between pretest and post test given to different graders, they all provide the same results ( $P < 0.05$ ). They imply that the five APA learning models are effective in increasing students' achievements in terms of their physical movements and competence in optimizing the brain function.

The APA learning model have some more benefits : beside increasing students' achievement in terms of their basic physical movements, it can be used for improving the focus of attention; they train the students to be brave and stand alone (even they are disabled); making students more active; giving a chance to the student to develop and apply more complex basic movements; arising the students' creativity; helping the student to transfer new ability in a new situation; increasing the students' happy feeling; they can be used as therapy; providing high level of safeness.

However the product also has some limitations, as follow: many other factors are left unanalyzed; the research needs much expenses; and the media used in the research can only be used once.

### Conclusion and Suggestion

The conclusion of this research are: the five APA learning models for improving basic movement in terms of their contents' adaptivity towards the students of mentally disabled ele-

mentary school's characteristics and prove to be effective; the implementation of the models proves that they are easy, safe, providing happy feeling, and useful; APA learning models are effective to increase the achievement of mentally disabled elementary school's students.

Whereas the suggestions proposed are: these learning models can be used as alternative teaching materials to improve the adaptive physical activities to mentally disabled students; and the learning can be optimized.

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