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Development of Play Model: Efforts to Improve Basic Movement Skills for Elementary School Students

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Abstract. Basic movement skill is important in performing movements in any sport activities. Having good essential movement skills will make it easy for someone to do sports. One effort that should be possible is through the development of a play model. The purpose of this study was to develop a play model and the the effectiveness of a play model on basic movement skills. Research and development with *Analyze Design Develop Implementation and Evaluation* (ADDIE) was employed to develop play models. The play model was designed in such a way through the stages of identification, game user targets, learning outcome, game time, overall goals, game variations and the final part of the game. This study was participated by third grade elementary students with 84 students in total with an average age of boys (± 9.5 years), and girls (± 9.7 years). The treatment was carried out 16 times for twice a week during class break. This study used three instruments, namely student perception questionnaire, knowledge test and the *Test of Gross Motor Development* (TGMD-2), with locomotor test items and object skills. This study had produced a play model product and shown a significant effect of developing a playing model on improving students' basic movement skills.

Keywords. basic movement skill, play, model development

Introduction

Basic motor skills provide health benefits, however, the level of basic motor skills in children and adolescents is still low (L. M. Barnett, Lai, et al., 2016). Basic motor skills will form the basis for practicing a wide variety of sports. (Goodway et al., 2012) revealed that children who are more physically active develop basic movement skills and in turn have an impact on good perceptions of children's competence. Basic movement skills will contribute to maintaining a healthy body. Basic movement skills are the building blocks of more advanced, complex movements required to participate in a game, sport or other context-specific physical activity (Logan, Ross, Chee, Stodden, & Robinson, 2018).

A study conducted (Hardy, King, Espinel, Cosgrove, & Bauman, 2010) on physical activity and school Nutrition highlighted that most children should have mastered essential basic movement skills by ages 9-10 before successful transition to a more advanced skill in a sport-specific stage. However, the rapid pace of modernization has made children less mobile. In Indonesia, the problem of obesity in children aged 5-12 years is still high, namely 18.8

percent, consisting of 10.8 percent fat and 8.8 percent very fat (obesity) (Research and Development Ministry of Health, 2013).

The results showed that girls with a low total mastery of basic movement skills had a higher body mass index and percentage of body fatness than the girls with better mastery of basic movement skills, whereas this was not proven in boys (Duncan, Bryant). , & Stodden, 2017). (Kane & Staples, 2016) recommended developing interventions for long-term participation in physical activity. Due to different proficiency in FMS and self-confidence, some adolescents may require different attention and focus on different interventions specifically targeting their needs (McGrane, Belton, Powell, & Issartel, 2017). In addition, in improving students' basic movement skills, there are several important cores that must be considered.

Skills are learned by doing, not from learning. (L. Barnett, Hinkley, Okely, & Salmon, 2013) agreed that "one can acquire a baseline level of multiple FMS through exploration and have the opportunity to do so, be involved, and have a suitable environment with space, equipment and positive reinforcement that enables us to practice and learn". However, not every child has access to conditions that will encourage learning at an appropriate level or has the ability to learn independently even when the environmental conditions are favorable. (Goodway, Robinson, & Heather, 2013) stated that a number of early childhood intervention programs showed that when young children were given free play time, they did not significantly improve FMS. Furthermore, only under instructed and designed conditions, the significant changes in FMS were performed. Research (Wick et al., 2017) revealed that the limitations of future research do not yet have a strategy for improving basic movement skills. In this study, researchers tried to use the development of a play model to improve students' basic movement skills. In addition, (Foulkes et al., 2017) suggested that the duration of the game must be longer or with repeated frequency so that it becomes more effective. In addition, future research should focus on effective interventions of appropriate duration to improve basic movement skills. Basic movement skills are strongly influenced by various factors, one of which is the physical activity undertaken (Chan, Ha, Ng, & Lubans, 2018). Furthermore, (Behan, Belton, Peers, O'Connor, & Issartel, 2019) stated that:

> Future research should seek to explore basic movement skills through physical activity of children, while simultaneously improving physical fitness. In addition to that, researchers must also understand what motivates children to participate in physical activity.

This study attempts to apply the development of a play model as an intervention which is expected to improve basic movement skills. This strategy has the potential to improve basic movement skills among elementary school children. The game that was designed was combined with supportive media to improve basic movement skills. The games can be small ball games, big ball games, net games, field games, climbing and so on. "Further research is needed to investigate the resistance training that may be played in improving basic mobility skills and there should be a focus on process and product-oriented results" (Collins, Booth, Duncan, & Fawkner, 2019).

Physical activities which are designed with various considerations will support the development of basic movement skills. One of the activities that children love is playing assorted games. Play Model of students signifies that expertise in skills can be taught in the context of a game. Others also emphasized that teachers who demonstrate a deep understanding of game-centered pedagogy are able to balance the teaching of skills or tactics in the context of game play (L. M. Barnett, Stodden, et al., 2016). In addition, (Goodway et al., 2013) stated that

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a number of early childhood intervention programs showed that when young children were given free play time, they did not significantly improve basic movement skills, and only under instructed and designed conditions the significant changes occured on basic movement skills. (L. Barnett et al., 2013) agreed that one can acquire a basic level of some basic movement skills through exploration and have the opportunity to do so, be involved, and have an environment suitable for space, equipment and positive reinforcement that allows us to practice and learn. Hence, it is assumed necessary to develop a play model to improve basic movement skills. This becomes the research background on the development of basic movement skills through a play approach. Besides, students with different backgrounds can obtain the same opportunity to improve their basic movement skills.

Methods

This research employed research and development methods by following the steps of the *analyze-design-develop-implement-evaluate* (ADDIE) model (Branch, 2009) to produce an instructional method in order to improve basic movement skills. The research was conducted from March 2019 to May 2019. Participants in this study were 84 elementary school students aged 8-9 years who were divided into two groups, namely experimental group and control group. In this study, the participants were third grade students in elementary school. All students who took part in this study had received permission from their parents and the authorities at the school. The instrument utilized in this study was Test of Gross Motor Development2 (TGMD2) with Locomotor Test Items (run, gallop, slide, hop, leap, and horizontal jump) and Object Skills (striking a stationary ball, stationary dribble, catch, kick, overhead throw, and underhand roll) (Ulrick, 2000). SPSS 20 was used to analyze the data.

Research finding and discussion

Research Finding

Analyze Stage (Analyzing)

The analysis stage produced several results. One of them is validating differences in results, determining instructional objectives, confirming the intended audience, identifying the sources needed, determining the delivery method (including estimated cost) and developing designs. The data are presented as follows:

Table 2
Validation of Expected Performance and Causes

Actual Performance	Expected Performance	Primary Causes
Research (Wicaksono & Nurhayati, 2013) "The motor skills of 4th grade students can be categorized as moderate. The percentage of the criteria classification for students' motor skills in very good category was 5.04%, 24.37% in good category, 39.50% in moderate category, 24.37% in less category , and 6.72% in very poor category." 2. Research (Ahmad Karisman, Febria Friskawati, & Supriadi, 2018) It was found that the results of students' basic movement skills were in the medium category. 6.21% in very good category 6.21%, 20.12% in good category, 34.07% in medium category, 28.15% in poor category, and 11.45% in very less category.	Mastery of basic movement skills. "The mastery of basic movement skills is at the age of 2-10 years including the transition to the next stage (Gallahue, Ozmun, & Goodway, 2012). Important basic movement skills are at ages 9-10. "Most children should have mastered essential basic movement skills by ages 9-10 before a successful transition to more advanced skills in a sport-specific stage (Hardy et al., 2010, p. 168)." Gross motor competence in children is very important for healthy physical	Mastery of basic movement skills. "The mastery of basic movement skills is at the age of 2-10 years including the transition to the next stage (Gallahue, Ozmun, & Goodway, 2012). Research (John, 2011, p. 149) found that "the total time spent by children and adolescents in front of a television or computer screen can be a trigger for inactivity and being overweight". Obesity in children aged 6-7 years can also reduce the level of

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3. Research (Roberts & Fairclough, 2011, p. 257) examining the relationship between teacher expectations and ALT-PE in a basketball setting observed that "25 percent of lesson time was dedicated to subject knowledge, in particular, techniques and motor skills, 53 percent of lesson time was dedicated to the subject's motor, which included training opportunities (44.9 %) and games (2.1 %) ". Finally, 22 percent of lesson time is involved in general content, which includes transitions between activities, management, and breaks. This shows that a lot of time was wasted on learning physical education. If it was assumed that the learning time was 90 minutes, 24.44 minutes became meaningless in learning. 4. Research (Foulkes et al., 2017) suggested that the duration of the game must be longer or with a frequent frequency so that it becomes more effective. In addition, "future research should focus on effective interventions of appropriate duration to improve basic movement skills. 5. Penelitian Further research is needed to investigate resistance training that may play in improving basic mobility skills and there should be a focus on product-oriented processes and outcomes (Collins et al., 2019).	and social development and in daily life. (Tsangaridou, 2012, p. 277) emphasized the positive contribution of fundamental movement skills (FMS) in supporting the development of social, cognitive and affective skills " Research (L. Barnett et al., 2013) agreed that "a person can obtain a baseline level of some FMS through exploration and have the opportunity to do so, be involved, and have an environment suitable for space, equipment and positive reinforcement that allows us to practice and learn ".	intelligence due to decreased activity and creativity of children and tend to be lazy due to being overweight "(Sartika, 2011) Research (Bolger et al., 2017) stated that: knowledge about the skill level of elementary school children is expected to help all components such as parents, schools, teachers, and the government in identifying problems. Also, targeting physical activity in the school environment, free time, and the amount of play time. Increased levels of physical activity, increased teacher expertise and targeted school interventions on basic mobility skills.

After determining the performance gap, further stage is to define the learning objectives. Learning objective: "Practicing the basic movements of simple games and sports and the values contained therein".

Design Stage (Designing)

The second phase in the ADDIE approach is the Design Stage. At this stage what will be completed is to determine the expected performance goals. The performance objectives are presented in the following table:

Table 4
Performance Objectives

Test Items	Objectives	Tasks
Students' perceptions about model development. **Students' knowledge test about activities while using the play model development** **Basic Movement Skills Test.** **Test of Gross Motor Development**	To determine the level of students' perceptions of developing play models To find out students' knowledge at the time of implementing the play model development. To find out the basic movement skills of students	Filling in the perception questionnaire Filling in the knowledge about the development of the play model. Performing Locomotor Tests and Object Skill Tests

Develop Stage (Developing)

The second phase in the ADDIE approach is that the develop phase will take six steps. This stage is in the form of holding and validating learning resources. Creating content is the first thing in the development phase. In this research, games are developed. At this stage students

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will be directed to learning both at the start, core and closing. The following is a lesson plan and the stages in creating game content.

Table 5
Lesson Plan

Events	Teaching Strategy	Teacher or Student
Motivation	Presenting a playing model in learning accompanied by music both during warm-up, core and cool-down.	Teacher: providing understanding and motivation to students
Objective	Practicing the basic movements of simple games and sports and their values	Teacher: explaining learning objectives and motivates students
Precondition	No precondition	Student: following the teacher's directions
Content	Warm up (initiative games dan music) Core (initiative games dan music) Cool down (music)	Teacher: explaining how to play both in the warm-up, core and cool-down stages.
Practice Instruction	Practice manual	Student: following the instructions according to the instruction manual.
Feedback	Giving motivation	Teacher: giving a sense of excitement and encouragement so that students are enthusiastic about learning
Assessment	Basic movement skills test	Student: taking the test
Closing	Learning evaluation	Teacher: providing an evaluation of the work done by students

In this study, the game designed basically aimed to develop basic motor skills, both stability (non-locomotor), locomotor, and manipulative skills. In the preliminary development design of this product there were various games, namely as follows:

a. Non-locomotor games, namely: Throw Packages, Ant Wrestling, Tug of War, Short Stories, Pass the Aisle, Creep and Rolls, Avoid Rockets, Avoid Comets, Avoid Cats, Become a Plane, Become a Stork, One Leg Train, Pelvis, Train, Walk in Over the Block, Push the Cart.
b. Locomotor games are: Animal Path Stories, Twirling, Snakes, Obstacles, Cat and Mice, Taking the Stars, Block Jumping, Stack Jumping, Walking Blocks, Take the Stars, Catch Birds, Catch Mosquitoes, Cross the River, Become a Frog, Jump the Lines, Plane Tiptoe, One Foot Walk, One Line, Parachute, Animal Circle, Crab Walk, Become a Deer and Stork, Become a Sculpture, Cross theks, Jump in Place, Jump Rope and Jump Walking Rope.
c. Manipulative Games namely: Straight Road, Falling Fortress, Bouncing Ball, Moon Throwing, Star Throwing, Catching the Moon, Catching the Star, Attacking, Rolling Traping, Kick Run and Hold, Back and Forth, Hit and Run, Triangle, Mini Softball, Reflecting Colour, Take the Ball from Opponent, Dribble Zig-zag, Drifting, Earth Throw, and Mini Volley

The game design that had been made then being reviewed by experts. Expert analysis was carried out by the researcher as a material used to validate and ensure that the model

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developed can be successful in developing basic movement skills. To find out the product feasibility, a product feasibility questionnaire was utilized. Expert validation was presented in the following graph:

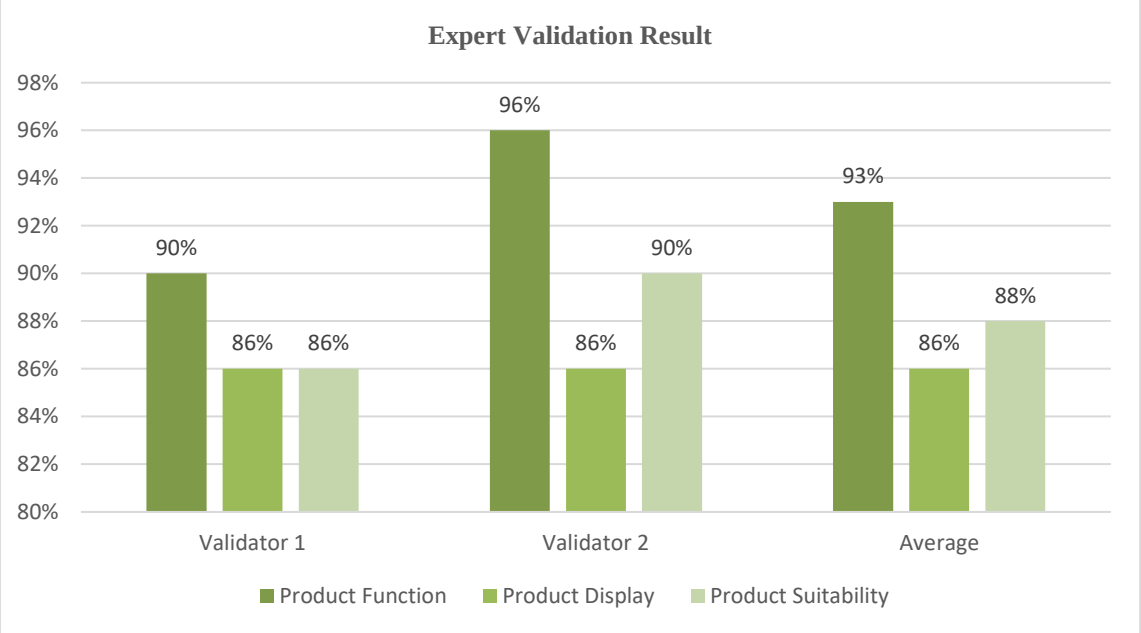

Image 3
Expert Validation Result

The validation result from the first and second validator shows an average product function reaching 93% which means very eligible, product appearance is at 86% which means very attractive, and 88% of product suitability is signifying an optimum suitability. The validation result indicates that the development product is impressive and ready for use in the implementation stage. The next stage is to choose or develop supporting media. The supporting media in this research is substantial. Each game will use various supporting media. The supporting media developed are as follows:

***Implement* Stage *(*Implementing)**

The second stage in the ADDIE approach is the Implement Stage, in this phase there will be 2 steps. The analysis to be carried out is as follows:

1. Preparing the teacher

Teachers got prepared with guidebooks on them. This guidebook was created to make it easier for teachers to carry out learning activities. The guide contained all learning activities. Each activity consisted of three component: stability skill, locomotor, object skill. The learning started with the activity of opening, core and closing.

2. Preparing students

Students were prepared to be able to follow the play model created. Through a variety of games combined with music, students are actively moving. The more students do physical activity it is expected that the students will improve their basic movement skills. Students are given instructions in the form of pictures of all game activities.

3. Model Implementation

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After preparing the teacher and students, the next stage was the implementation of the model development that had been conducted. The implementation stage was performed through the following design:

Treatment	R	O	X	O
Control Group	R	O	C	O

Image 3.1
Research Design in Model Effectiveness Test
(Fraenkel, Wallen, & Hyun, 2012)

Through this design, the participants were separated into two groups. The first group got a treatment using the play model development, and the second group was not given any treatment. Through the implementation of this design, it was hoped that the effectiveness and significant results among these two groups could be seen.

***Evaluate* Stage (Evaluating)**

Evaluation of basic movement skills can be seen in the data below:

Paired Sample Test of Experiment and Control Group

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Posttest_Eks - Pretest_Eks	25.73469	5.83859	.37301	24.99996	26.46943	68.991	244	.000
Pair 2	Posttest_Con - Pretest_Con	1.83333	3.50930	.22652	1.38709	2.27957	8.093	239	.000

The paired sample test table indicates that a mean of 25.73 is obtained and identified as the difference in the scores from the pretest and posttest of basic movement skills after the development of basic movement learning model is assigned. In addition, statistical data illustrates that the statistical price of t = 68.991, with df = 244, and a significant number or p-value = 0.000 <0.05 or H0 is rejected. Thus, there are differences in the results of students' basic movement skills after being treated with the development of a basic movement learning model. In sum, there is a remarkable effect of developing basic movement models through play activities on improving students' basic movement skills.

Furthermore, the pretest and posttest in the control group showed that a mean difference is equal to 1.833. Furthermore, the t statistic price is 8,093 with df 239 and a significant number or p-value = 0,000 <0.05 or H0 is rejected. This means that there are differences in the results of basic movement skills that are intervened by the development of basic motion learning models in students. To conclude, there is a significant effect of conventional learning on basic movement skills.

Based on the results of the evaluation stage that was completed through basic movement skills instruments, it is implied that:

1. The average pretest and posttest results of the experimental group showed an increase.
2. The average pretest and posttest results of the control group indicates a rise.

3. When the experimental group compared to the control group, it is clearly seen that the average of experimental group is greater than the control group.
4. The t-test results reflects significant results from the experimental group and the control group.

Discussion

The results presents that there had been changes in both experimental group and control group. The treatment by using the development of a play model sharply improved students' basic movement skills. This happens because through the games students feel joyful so that what is done is unconsciously performing various physical activities (Fitri et al., 2016). Moreover, in the play approach, students are given the freedom to express their abilities towards the learning objectives that have been set. By playing, it is hoped that students can have creativity and initiative to solve problems that arise during the learning process. Through playing, a competitive element is also developed, so that students compete to show their abilities (Prasetyo, 2016). (Frost et al., 2012) suggested that children enjoy these group activities and sports, are proud of their uniforms, and look forward to the games and performances. If handled properly by adults, exercise can have positive effects, including the social experience of being part of a group. Nonetheless, sports activities are organized and led by adults, and physical activity is limited to those related to sport.

Physical activity that is directed by the teacher plays an important role in gross motoric development because the teacher can accompany the child in various activities that ensure the child will develop the desired physical movements. The physical development of children can be evaluated and attention is paid to correct inappropriate movements that may become obstacles to the child in life later when participating in sports and recreational physical activities.

According to (Butler & Griffin, 2010) by learning skills through games, students get a deeper understanding of how to apply their skills in game situations. This ability is useful for communicating and applying knowledge in a number of different situations. This is one of the main principles of physical literacy.

According to (Roach & Keats, 2018) the active play approach provides more advantages to basic movement skills. This indicates that playing actively can improve basic movement skills. In addition, basic movement skills are also influenced by physical activity and gender. (Jarvis et al., 2018) identified a gender-specific component of physical activity that differentiates children with different levels of basic movement skills. Through proper physical activity, basic movement skills can be improved. Apart from that, gender also affects basic movement skills.

Physical activity guidelines and position statements emphasize the importance of 'activities to strengthen muscles and bones' and research showed that resistance training impacts basic movement skills (Collins et al., 2019). Through guidelines like this study using, the development of a play model significantly improves basic movement skills. The development of a play model becomes a guide in carrying out physical activities during school breaks.

The findings from this study suggested that children who were more competent in basic movement skills spent more time engaging in moderate to vigorous physical activity. Children who were more competent in object control skills engaged in more moderate to vigorous physical activity during their lunch breaks and school breaks. What is more, children who demonstrated higher levels of competence in locomotor skills and object control skills engaged in more moderate to vigorous physical activity after school (Cohen et al., 2014). These findings revealed that the amount of physical activity determined the increase in basic movement skills.

As shown in this study, physical activity was in the form of developing a model of playing as a physical activity. In addition, each physical activity that was carried out for 60 minutes used moderate to strong intensity according to the recommendations of the WHO.

Group play and briefing require children to interact with their peers and encourage them to cooperate and develop teamwork. Games can also be used to instill fun and enjoyment and add variety to warm-up and cool-down activities (Ministry of Education, 2013). Through this game, students can be trained and can improve basic movement skills in a pleasurable way.

The game model has the following potentials: (1) facilitating the development of technical skills and tactical knowledge; (2) empowering children to learn independently and responsibly; (3) assessing tactical transfers across games; and (4) increasing the fun and enjoyment of playing games (Wang & Ha, 2013). The play approach is loaded with teaching tasks given to students, stimulating them to think and discover for themselves the reasons that underlie their performance. This approach provides a lot of understanding to students of the benefits of each of their actions and behavior. Thus students are given the widest possible opportunity to assess themselves and their abilities during the learning process (Singgih, 2012). Games provide opportunities to gain knowledge about something, cultivate imagination, provide opportunities to interact with the environment, and to express oneself in ways that are socially acceptable (Suherman, 2014). Through various games students will improve their basic movement skills.

As children develop, long before they have completed their growing stature, it is important to develop basic skills such as agility, balance, coordination and speed and to learn them in a delightful way. Some sports such as gymnastics, diving and figure skating require specialization at a young age. However, most lifelong sports are end-specialty sports, such as football, basketball and volleyball. For this sport, specialization should not occur before the age of 12 to 15. For most sports, children benefit from having a thorough experience in a variety of activities (Byl & Kloet, 2014). By having basic movement skills, a person will find it easier to adapt to any sports techniques. A good adaptation will make it easier for someone to do multiple physical activities. This study develops a basic movement learning model by playing activities, through diverse activities students feel happy to participate in activities during physical education learning. Also, upon significant effectiveness testing, the development of basic movement models through playing activities can enhance basic movement skills.

CONCLUSION

Research on developing play model has been conducted through ADDIE Research and Development. The development of a play model that is well-designed and made with diverse variations has an impact on enhancing students' basic movement skills. Furthermore, this study used break time so that students' playing activities were more focused so it was ensured that essential basic movement skills could be improved. By having good basic movements, students will easily practice many types of sports. Also, with the ease of carrying out various physical activities (sports types), the level of student participation in sports can improve. This improvement is expected to enhance an active and healthy lifestyle. Future research needs further studies to discover physical activity after school. On top of that, the limitation of this study turns out to be the number of participants which is not too big

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