7 (1) (2018) 44 - 49

Journal of Physical Education, Sport, Health and Recreations

http://journal.unnes.ac.id/sju/index.php/peshr

Fundamental Movement Skills and Moods as Predictors of Games Performance in Primary School Students

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Article History

Received 10 February 2018
Accepted 10 February 2018
Published February 2018

Keywords:
Fundamental Movement Skill; Mood; Games Performance; Invasion Games.

Abstract

The purpose of this study was to determine how far FMS and mood contribute toward games performance on elementray school student through invasion games activities (modified soccer and handball games). This research uses a correlational explanatory and regression . Third grade elementary school students (n=40) were enrolled in this study consisting of 21 male students and 19 female students. To determine the games perfromance using The Games Performance Assessment Instrument (GPAI) and Brief Mood Introspection Scale (BMIS) to measure the mood of the students. The increase in FMS of 0.005 units will predict the increase in the variable SB by 0.005, then the increase in the positive mood of 0.43 will predict the increase in the variable of 0.43 units, while the increase in negative mood variable of 0.030 will predict a decline in the SB variable of 0.030. The result showed that FMS and positive moods contributed toward games performance on both games.

How to Cite

Wibowo, R., Nugraha, E., Sultoni, K., (2018). Fundamental Movement Skills and Moods as Predictors of Games Performance in Primary School Students. *Journal of Physical Education, Sport, Health and Recreation,* 7(1), 44-49.

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p-ISSN 2460-724X
e-ISSN 2252-6773

INTRODUCTION

Fundamental movement skills are seen as 'the basic foundation' for lifelong physical activity. Previous studies have indicated a positive relationship between fundamental movement skills and the regular participation of children in physical activity (Vandorpe et al., 2012). The study proves that the attractiveness of displaying fundamental movement skills at the primary school level tends to contribute in improving the habit of physical activity and participating in regular physical activity, thereby being able to prevent obesity of children and adolescents (Mitchell et al., 2013). This counteracts the misconception that the fundamental movement skills of children are acquired naturally as growth into adulthood (Mitchell et al., 2013).

Therefore, children should be given the opportunity to have the widest possible physical activity in order to develop fundamental movement skills. In other words, the learning of motion skills should be given and practiced since elementary school. One strategy for developing fundamental movement skills is through play, which can facilitate the ability of a child's motor skills as this is one of the gates of the child's world. Children play with the ultimate goal of learning to recognize their body and learn to move.

Among the important factors that play a role in improving the opportunity to learn motion skills and the concept of motion is through physical activities and games. The play approach evolved from the dissatisfaction of the approach-the technique approach applied to children (Kenneth and Ronglan, 2012). Charisticistic elementary school students who love to play require elementary school teachers to carry out educational activities that charge more games for lower classes. Elementary school teachers should design learning that allows for the element of the game in it. The game in fundamental movement teaching emphasizes the aspect of how to teach students to understand the concept of fundamental movement in the context of play. Implementation of the game activity is very appropriately applied to elementary school students lower class because it is in accordance with the characteristics of students who are still in play.

Recently a lot of research has developed games to improve bafundamental movement skills, one of them is with games console (Barnett 2015a; Papastergiou 2015; Akbari et al. 2009; Johnson et al. 2016; Barnett 2015b) as well as simple motor skills games or programs - the game's physical activity game (Brian et al., 2016) (Bryant & Duncan 2016). Game-focused learning emerges to promote climate-oriented mastery of motivation to create child motivation in physical education learning (Gray et al. 2009) and also enables increased learning outcomes in school (Ericsson & Karlsson 2012).

In the game of teacher invasion provide simple games in order to adjust to the child's developmental level. But the limited research that describes what factors affect the performance of children in play, especially in the game of invasion become one of the motivations to try to dig deeper.

In the context of learning, especially physical education, the state of mood students certainly has a role in the learning process. Whereas in physical education requires physical activity and physical performance in the context of education. In implementing game activity in elementary school age children, physical education teachers need to know the various factors that influence the child to be passionate about the activities of the movement and increase the passion of the child through the activity of motion.

Previous studies have suggested that a person's mood influences play or play performance (Jani, & Amer, 2017; Russell & Newton, 2008) and sample cognitive performance (Shukitt-Hale et al., 1991; Crowley et al., 1992). When viewed from the positive mood Hansen et al. (2001) showed that moderate intensity exercise duration of 10 minutes can increase the production of positive psychological benefit. From some previous research literature, it has been able to explain how mood increases due to physical exercise (Weinberg & Gould, 2007) and how moods affect the performance of an athlete in a race. But the authors have not found a study that explores the influence of moods on learning settings of school movements, especially in primary schools.

There are several instruments to know the state of one's mood. One of them uses the Brief Mood Introspection Scale (BMIS).

As previously explained that fundamental movement skills can be developed through games. However, whether the performance of fundamental movement skills contribute to student performance in play can not be ascertained empirically. So does the student's mood when playing, does it also contribute to the performance of the child in play? It seems to need to be explored more deeply as a basis for developing children's movement skills especially in the game of invasion. The purpose of this study is to determine the contribution of fundamental movement skills and moods to play skills.

METHODS

The research method used in this research is correlational experimental method. This study used correlational design and prediction with regression analysis. This research will involve lecturers, students and elementary school students in Bandung. Subjects of students who will be involved are third grade students of elementary school (21 girls, 19 men). The sample characteristics (mean ± standard deviation) are: age = 9.1 ± 0.54 years; height = 1.25 ± 0.3; and weight = 27.4 ± 0.3). All samples are healthy without physical disability.

Analysis and data processing used in this research are: Statistical Product and Service Solution (SPSS) 22. Data analysis which researcher do in this research is, to analyze FMS contribution data and mood to play skill using correlational analysis and linear regression.

Research Procedure

The first test conducted was The Test of Gross Motor Development (TGMD-2) to measure fundamental movement skills (FMS) that can be used to measure FMS of children aged 3- 10 years (Mazzardo et al. 2008; Bardid, Huyben, et al. 2016). The fundamental motion skills test (FMS) consists of two test domains, namely the locomotor test domain and the object test control domain. Each test domain consists of six tests, the total test totaling 12 test items. Adapted from Ulrich and Wouter, (De Meester et al., 2016; Barnett, Ridgers, Zask, et al., 2015) each student was given two occasions for each test. The test results are then incorporated in accordance with the scoring criteria guidelines / converted to a percentile score according to the age and sex of the student.

A week later, students fill out the BMIS moods questionnaire and perform simple invasion activities. Filling out the moods questionnaire was done before the invasion game. Researchers help students fill out the questionnaire of each item. Then proceed to game session. The game consists of the dominant arms invasion game that is in the form of modification of handball and the dominant leg game in the form of football modification game. Both games are modified in terms of rules, wide field and goal adjusted to the student's ability. Both games are done in the same time randomly. The game is adapted from (del Campo et al. 2011; Gutiérrez et al. 2014) in the form of small-side games 4 vs 4 without the goalkeeper. Before the game students do standard heating for 10 minutes consisting of jugling, passing and passing-intercepting. Game is divided into two rounds and each round for 8 minutes. During the game, all events are recorded using Sony HDR CX405- 9.2 MP video camera. Video recordings are used to assess students' playing skills during the game. Play skills are evaluated using GPAI.

RESULTS AND DISCUSSION

From the test result on the research subjects (n = 40), first use the correlation test between skill of playing game invasion game modification (BT) and soccer (SB) to fundamental movement skill (FMS) and student Mood is shown in **table 1**. Correlation among variables variables were tested using Pearson's correlation coefficients (for parametric data), and Spearman's correlation coefficients (for non-parametric data). SPSS software (version 22.0, IBM) is used to compute all variables. While the normality test using Kolmogorov-Smirnov on each correlational test .

Table 1. Mean (± SD) Research Variable

Variable	Mean ± SD
BT	0.64 ± 0.014
SB	0.633 ± 0.005
FMS	14.22 ± 13.2
Pos Mood	2.9 ± 0.66
Neg Mood	2.7 ± 0.76

Table 2. Correlation between BT playing skills, SB against FMS, Moods Positive and negative

	FMS	Pos Mood	Neg Mood
BT Correlatio Coefficient	.337*	.336*	.170
Sig. (2-tailed)	.033	.034	.294
N	40	40	40
SB Correlation Coefficient	316*	.484**	.195
Sig. (2-tailed)	.047	.002	.228
N	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 2 shows the results of Spearman's Rho correlations, the correlation between modified handball (BT) skills, fundamental movement skills (FMS) and Mood (positive and negative). Correlations between BT and FMS showed significant coral ($P < .05$; $r = .337$). BT correlation with positive mood also showed significant cor-

relation (P <.05; r = .336), in contrast to negative mood showed very low correlation (P <.05; r = .170). In the modified soccer ball (SB) skill, the correlations between SB and FMS show significant coral (P <.05; r = .316). BT correlation with positive mood also showed significant correlation (P <.01; r = .484), in contrast to negative mood showed very low correlation (P <.05; r = .195).

Table 3. Linear Regression Test
Playing skill modification handball invasion

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.371	.079		4.673	.000
FMS	.007	.006	.220	1.268	.213
Pos_Moods	.105	.040	.588	2.622	.013
Neg_Moods	-.051	.031	-.328	-1.642	.109
a. Dependent Variable: BT					
Regression Formula Y= a + b (X1) + b (X2) + c (X3)					

Based on the above linear regression test obtained equation of regression model as follows :
BT = 0,371 + 0,007 (FMS) + 0,205 (Pos_Moods) – 0,051 (Neg_Moods)

Seen from the above regression equation it can be interpreted that the increase in fms of 0.007 units will predict the increase in the bt variable of 0.007, then the increase in the positive mood of 0.205 will predict the increase in the variable of 0.205 units, while the increase in negative mood variable of 0.051 will predict decline of bt variable of 0.051.

Based on the above regression equation it can be concluded that any increase of bt variable will be predicted by the increase of fms variable and positive mood, and every increase in bt variable will be predicted by decrease in negative mood variable.

Table 4. Linear regression test skills play invasion football modification
Skill play invasion modification handball

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.524	.057		9.240	.000
FMS	.005	.004	.217	1.129	.266
Pos_Moods	.043	.029	.375	1.509	.140
Neg_Moods	-.030	.022	-.299	-1.350	.185
a. Dependent Variable: S_GP_1					
Regression Formula Y= a + b (X1) + b (X2) + c (X3)					

Based on the above linear regression test obtained equation of regression model as follows:
SB = 0,524 + 0,005 (FMS) + 0,43 (Pos_Moods) – 0,030 (Neg_Moods)

Seen from the above regression equation it can be interpreted that the increase in FMS of 0.005 units will predict the increase in the variable SB by 0.005, then the increase in the positive mood of 0.43 will predict the increase in the variable of 0.43 units, while the increase in negative mood variable of 0.030 will predict a decline in the SB variable of 0.030.

Based on the above regression equation it can be concluded that any increase of SB variable will be predicted by the increase of FMS variable and positive mood, and every increase in SB variable will be predicted by decrease in negative mood variable.

Based on the results of the above research, mastery of fundamental movement skills is important for elementary school students. Students with improved motor skills will have higher physical activity (Okely, 2009). But fundamental movementskills need to be provided with attractive packaging so that students interested in physical activity. The invasion game which is one of manipulative skills can develop a child's understanding through motion in physical education (Mazzardo et al., 2008). Based on the results of this study proves that the fundamental movement skills correlated significantly with the performance of students in performing the game invasion activity. Both game invasion modification handball and football.

Similarly, the mood variable, positive mood juaga strongly correlated to the appearance of children in the game of invasion. Not unlike previous research that moods states positively correlated to play performance (Beedie et al., 2000; Lane & Chappell, 2001). But this study is a game setting in the context of learning motion instead of sports competition. The results of the study of 9-year-old elementary school students showed that mood state influences the playing skills.

Posotive moods have a positive correlation to child play skills in simple invasion games in line with previous research (Terry et al. 2000; Lane and Terry, 2005; Jani, & Amer, 2017). Therefore it is important to create a fun atmosphere in teaching the game of invasion. Previous research has shown some strategies to improve the mood of children in order to improve performance such as individual communication strategies (Stevens & Lane, 2001). Instead of engaging in the game, enthusiastic play and get the fun of playing (Aggerholm & Ronglan, 2012).

Based on the analysis of the regression equation it can be concluded that any increase in BT variables will be predicted by the increase of FMS and positive mood variables, and any increase in the BT variable will be predicted by a decrease in negative mood variables. Similarly, the SB variable will be predicted by an increase in the FMS variable and positive mood, and any increase in the SB variable will be predicted by a decrease in the negative mood variable.

CONCLUSION

Fundamental movement skills (FMS) and moods make a significant contribution to the invasion-playing skill of game modification and football. That is, any increase in the FMS and moods variables is predicted to be followed by an increase in the variable playing skills.

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