

Mood States and Game Performance in Invasion Game Activities:

A Correlation Study Among Elementary School Students

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Abstract—Children play games for the same reason. They play because playing is fun. Interest to games may have meaningful psychological benefits for children. The purpose of this study was to examine the association between short-term psychological effects, especially moods states, and games performance in invasion game activities setting at elementary students. Correlational approach was used to analyse the results of this study. Third grade elementary school students were enrolled in this study. Forty elementary students were assigned to invasion games in 8 minute game, which was divided into two minute halves. The game taught used invasion games was handball, which fields size and rules were modified. Pleasant and unpleasant moods using Brief Mood Introspection Scale (BMIS) were assessed before experimental conditions. BMIS with 8 subscales pleasant mood states (active, calm, caring, content, happy, lively, loving, and peppy) and unpleasant mood states (drowsy, fed up, gloomy, grouchy, jittery, nervous, sad, and tired) are rated on a 4-point Likert scale ranging from 1 (definitely do not feel) to 4 (definitely feel). It was found that pleasant moods states correlated with games performance and games involvement of the student in games activities. This study suggests physical educators to setting motivated climate to increase moods states in order to engage children in physical activities.

Keywords: moods, invasion game, physical education

I. INTRODUCTION

Children begin to play together to develop relationship with each other as well as with movement. Physical educators tend to call these creative or regularized movement activities games. Children play games for the same reason: they play because playing is fun. Interest to games may have meaningful psychological benefits for children. Physical activity can result in a number of short-term and long-term psychological effects, consistently associated with positive mood by increasing feelings of vigour and reducing tension, fatigue, and confusion [1,2].

At primary school age it is important to instil active lifestyles in children, instilling active life can be started by making children like a variety of motion activities, one of them through play activities. Implementing game activities in elementary school age children, physical education teachers need to know various factors that can affect children's arousal

when doing motion activities or increase children's arousal through motion activities, mood factors are one of them. Previous studies have suggested that a person's mood influences play or competition performance [3,4] and cognitive performance of samples [5,6].

If seen from a positive mood Hansen et al. show that moderate intensity exercise of 10 minutes duration can increase psychological benefits [7], some previous research literature explains how mood increases are caused by physical exercise and also how mood affects the performance of an athlete in a race. The purpose of this study was to determine whether the mood of elementary school children affect the performance when invading game activities [8].

II. METHOD

A. Participants

Students involved in this study were 40 elementary school students (21 girls; 19 boys) average age = 9.1 ± 0.54 years; average height = 1.25 ± 0.3 ; and mean body weight = 27.4 ± 0.3 . Students involved in this study are generally in good health and free from physical disabilities.

B. Instrument

1) *Brief Mood Introspection Scale (BMIS)*: The instruments used to measure moods in this study, namely: BMIS were adapted from previous studies [9-11]. Mood score measurement is measured through subtractive scoring based on the pleasant-unpleasant subscale consisting of 16 sub-item questions. Eight questions for moods pleasant (active, calm, caring, content, happy, lively, loving, and peppy) and eight for moods unpleasant (drowsy, fed up, gloomy, grouchy, jittery, nervous, sad, and tired). Each question pleasant is rated on a 4-point Likert scale ranging from 1 (definitely do not feel), 2 (do not feel), 3 (slightly feel), and 4 (definitely feel). Viceversa with pleasant scales, for unpleasant scales each question pleasant are rated on a 4-point Likert scale ranging from 4 (definitely do not feel), 3 (do not feel), 4 (slightly feel), and 1 (definitely feel). In this study the authors tried to

examine the correlation between the average acquisition of mood scores from the pleasant, unpleasant and total pleasant-unpleasant scores categories.

2) *Games Performance Assessment Instrument (GPAI)*: To characterize game play performance in invasion games, it is necessary to identify nonspecific observable components of game performance [12-15]. The tally scoring method was applied in this modified invasion game and were assessed from components from videotapes, which consisted of decision-making, skill execution, and support that were adjusted with students' abilities [14]. Tally systems can also be used in peer assessment procedures [14]. Among "decision-making" and "skill-execution" components, one or several elements were selected to evaluate the performance of individuals, reflecting their ability. The "support" component could be assessed when children tried to acquire the ball from their opponents, both during attack or defense. All of the 3 components could be adapted to various sports and game activities, and they did not only depend on on-the-ball skills, but also off-the-ball skills (both offensive and defensive) [14-16]. More detail about decision making, skill execution and support see table 1.

C. Procedure

Students are given information to fill in the mood questionnaire before conducting invasion game activities. Before filling out the mood questionnaire, students are reminded to fill in according to the actual (current) mood. Students are guided by researchers to understand and be able to fill each of the questions. Students fill in the question "What do you feel right now?" The researcher also reminds students that the question is not for learning assessment and has no effect on learning value. After filling in all mood questions, students proceed to warm up and play in the invasion game activity in the form of a modified 'like handball' game. Researchers apply invasion game activities to determine the students' playing skills as a result of adapting research conducted by Gutierrez [17].

The design of the modified invasion game for novices was adapted from those used in similar research in educational contexts (20). Subjects were evaluated through small-side games 4 vs 4 invasion games without goal keeper [18,19]. Before games, student following a standard 10 minutes warming-up consisting of juggling, passing and passing-intercepting. All students participated in the invasion games for 8 minutes, which was divided into two rounds, each round lasting 4 minutes. Fields and rules were modified in order to adapt with the students' games skills and hence, high-skilled and less-skilled children could be differentiated. This small-sided game can improve students' involvement in the game, either they control the ball or not [20]. The objective of the game was to score goals by throwing the ball into the modified goal post. In this game, each team has 2 goal posts, where goalkeeper were not present. Moving with the ball was possible just by bouncing; and stealing from an opponent and physical contact were not permitted. In case of foul play, the game will be restarted from the place where the infraction took place. In order to evaluate the overall performance, the games were

recorded with a video camera located behind and above the court [14,19,21]. Assessment criteria of the games see in table 1.

TABLE I. ASSESMENT CRITERIA IN INVASION GAMES ACTIVITIES

Decision	Point	No point
On-the ball	<ul style="list-style-type: none"> Pass the ball when team mates is open. Attempt to shoot on goal appropriate 	<ul style="list-style-type: none"> Pass the ball when team mate covered. Blocked while trying to shoot
Off-the-ball	<ul style="list-style-type: none"> Moving into a position to receive a pass (appropriate distance). 	<ul style="list-style-type: none"> No movement when needed
Skill Execution	Point	No point
Passing	Team mate receive ball easily	Team mates hard to get passed
Shoot	On the target	No target
Support		
Attack	Go forward and open space to receive ball or shoot	
Deffence	Try to cover opposite tim	

III. RESULTS AND DISCUSSION

Testing results for the subject (n=40) r was used to examine the correlation between moods states and games performance (GPAI) are reported in mean ± SD and shown in table 3. The correlation between variables were determined using *Pearson's correlation coefficients* (for parametric data), and *Spearman's correlation coefficients* (for non-parametric data). SPSS software (version 22.0, IBM) was used in all the above calculations. To determine data normality using Kolmogorov-Smirnov on each correlational calculation.

TABLE II. DESCRIPTIVE DATA

Descriptive Statistics			
	Mean	Std. Deviation	N
<i>GI</i>	15.2500	4.26524	40
<i>GP</i>	.6408	.11882	40
<i>Pleasant</i>	2.9487	.66416	40
<i>Unpleasant</i>	2.7830	.76264	40
<i>Pleasant_Unpleasant</i>	2.8655	.66539	40
<i>Active</i>	2.9500	1.01147	40
<i>Calm</i>	3.1750	.74722	40
<i>Caring</i>	2.6000	1.00766	40
<i>Content</i>	3.1000	.74421	40
<i>Happy</i>	3.1000	.77790	40
<i>Lively</i>	2.7000	1.04268	40
<i>Loving</i>	3.2250	.86194	40
<i>Peppy</i>	2.7250	1.06187	40
<i>Drowsy</i>	2.8000	1.06699	40
<i>Fed_up</i>	3.0000	.87706	40
<i>Gloomy</i>	2.8750	.85297	40
<i>Grouchy</i>	2.9500	1.08486	40
<i>Jittery</i>	2.7000	.93918	40
<i>Nervous</i>	2.4250	1.10680	40
<i>Sad</i>	3.1000	.84124	40
<i>Tired</i>	2.4000	1.12774	40

The initial step in analysing the data is to test the normality using the Kolmogorov-Smirnov one-sample normality test for

the purposes of determining parametric tests or non-parametric tests used in this correlation study. Based on the results of the normality test shows that the data are normal. Also Pearson's correlation coefficients are used to find out the correlation between research variables.

TABLE III. CORRELATION BETWEEN GI, GP, PS, UPS AND TPU

		<i>GI</i>	<i>GP</i>	<i>Pleasant</i>	<i>Unpleasant</i>
<i>GI</i>	Pearson Correlation				
	Sig. (2-tailed)				
	N				
<i>GP</i>	Pearson Correlation	.353*			
	Sig. (2-tailed)	.026			
	N	40			
<i>Pleasant</i>	Pearson Correlation	.587*	.336*		
	Sig. (2-tailed)	.000	.034		
	N	40	40		
<i>Unpleasant</i>	Pearson Correlation	.508*	.170	.732**	
	Sig. (2-tailed)	.001	.294	.000	
	N	40	40	40	
<i>Total Pleasant-Unpleasant</i>	Pearson Correlation	.585*	.266	.920**	.940**
	Sig. (2-tailed)	.000	.097	.000	.000
	N	40	40	40	40
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

Table 3 showed Pearson correlations, calculated to investigated relationship between moods states; pleasant (PS), Unpleasant (UPS), Total pleasant-unpleasant (TPU) toward game performance (GP) and games involvement (GI) in invasion games activities. The correlations between PS toward and GP were statistically significant but in low correlation ($P < .05$; $r = .336$) and correlation between PS toward GI were statistically significant with high correlation ($P < .01$; $r = .587$). Otherwise, correlations were no significant between UPS and GP ($P < .05$; $r = .170$) but significant correlation toward GI ($P < .01$; $r = .508$). While in TPU, showed relationship but no significant ($P < .05$; $r = .266$) and strong correlation between TPU and GI ($P < .01$; $r = .585$).

Similar to previous studies that mood states are positively correlated to playing performance [22]. However, this research is a game setting in the context of learning motion not competitive sports. The results of a study of elementary school children aged 9 years showed that mood conditions affect games performance, even though the correlation is low. Moods pleasant has a positive correlation with children's game performance in displaying simple invasion games in line with previous research [23,24]. In addition, this study shows that the better the child's mood, the higher the child's involvement games in the game. Therefore it is important to create a pleasant atmosphere in teaching the invasion game. Previous research has shown several strategies to improve children's mood in order to improve performance such as individual

communication strategies [25]. The main purpose of teaching motion learning in elementary school children, especially the lower classes, not only displays good play performance, but also involvement in game activities, enthusiastic play and getting pleasure from playing [26].

IV. CONCLUSION

Physical education teachers must be able to maintain or even improve mood when teaching physical education, especially when using invasion game activities as a learning media for motion, it is proven that children who have positive moods are able to display motion performance and are more involved in learning motion, for further research, it seems necessary to examine of various things that can improve a child's mood, from the beginning of learning and when the learning process is ongoing, learning settings and ways of communicating with students, all of which are expected to increase the child's enthusiasm for wanting to learn and after learning is over.

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