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A GAMES APPROACH AND TRADITIONAL APPROACH TO TEACHING DECISION-MAKING IN VOLLEYBALL AS EVALUATED BY THE GAMES PERFORMANCE ASSESSMENT INSTRUMENT

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ABSTRACT

The purpose of the study was to test the effectiveness of two different approaches to teaching decision-making in volleyball - the traditional approach, a skill-based teaching method, and the games approach, a teaching method using small games and tactical thinking. Skills were evaluated via the Games Performance Assessment Instrument (GPAI). 52 college students (mean age 17.2 yrs) were divided into two groups corresponding to the GPAI test used to determine the decision-making component of a game. They participated in two one-hour sessions each week for 8 weeks. Paired t-test was used to compare decision-making scores within groups. Results show there were no significant differences in decision-making within both groups. The authors speculate that the decrease in decision-making scores may have been due to the subjects still being in the process of learning and training rather than mastery. They showed more willingness to execute more skills but were not yet competent enough to achieve the desired outcome most of the time. These observations, however, were not measurable by the GPAI. A longer intervention period may have elicited more observable, favorable changes in decision-making and overall volleyball skills.

Keywords*: Game approach, traditional approach, decision-making, performance, teaching, volleyball.*

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1. INTRODUCTION

Teaching decision-making in volleyball in a school physical education setting can be challenging especially since classes are typically taught with a skill-based approach. School resources would suggest a traditional approach to teaching the game (Auditor, Javines, & Milla, 2009; Contreras Jr, Villanueva, Molinilia-Buhain, 2008; Dizer, Roque, & Marquez, 2009; Isidro, 2008; Tulio, 2008) but this traditional skill-based approach features little to no decision-making learning in games until all skills have been taught. Furthermore, skill application is usually only used towards the end of the curriculum. The traditional approach often begins with a warm-up, individual drills, group drills and scrimmage and is generally geared towards teaching specific volleyball skills. Reynaud and American Sports Education Program (2011) suggests the games approach as an alternative to the traditional approach. The games approach, more commonly termed as Teaching Games for Understanding (TGfU), addresses the challenge of developing learners' abilities in playing the game. The TGfU also develops more components such as decision-making (wherein a player makes an appropriate choice about what to do for skill selection during a game), skill execution (wherein a player efficiently performs a selected skill) and adjustment (an offensive or defensive movement as required by the flow of the game) as suggested by Griffin, Mitchell and Oslin, (1997). The TGfU contrasts the traditional approach which focuses mostly on skills. Many have suggested similar concepts and approaches in the TGfU style of teaching such as programs like Mini-Volleyball (Toyoda, 2011) and Cool Volleyball promoted by the Internationale Federation de Volleyball (FIVB).

Volleyball can be challenging to learn due to the fast rebounding of balls. Players must be trained to react to situations and make tactical changes independently (Beal, 2011). Teaching beginners to execute the proper skill during the 3-hit contact to a side of a team's court can be confusing. A task that can address this problem is with the use of a games approach early on during the learning process.

Tests for the traditional approach is straightforward and objective but for the games approach, evaluation has to be quantified through the Game Performance Assessment Instrument (GPAI). The GPAI is a multidimensional system designed to measure game performance behaviors that demonstrate tactical understanding as well as ability to solve tactical problems by applying appropriate skills. The GPAI provides analyses of individual game performance components (e.g. decisions made, skill execution and support) and/or overall performance (e.g. game involvement and game performance). Oslin, Mitchell and Griffin (1998) tested the degree of validity and reliability across four components

of the GPAI. The four components tested were decision-making, skill execution, support and adjustment. The test was done across three sports - basketball and soccer under the "invasion games" category and volleyball under the "net/wall games" category. Their study suggested that the GPAI is a valid and reliable method that may be used for assessing game performance. However, other practitioners of the games approach have raised some concerns and perceived problems in five areas in the GPAI scoring and coding system (Memmert & Harvey, 2008). One problem they mentioned was the calculation of individual and overall game performance indices. With the formula used in GPAI, it was possible to get a score of "zero" which may not indicate the true proper game performance index. Another was the issue on the use of game involvement versus the game performance index. The game performance index acknowledged game performance alone. In retrospect, it might not be a true indication of the game involvement a player shows during a game. With those limitations considered, this study aims to determine the effects of the traditional approach and games approach to teaching volleyball decision-making as evaluated by the GPAI.

2. METHODS AND MATERIALS

2.1 Participants of the Study

The participants were physical education students from a university in the Philippines and were randomly selected through a computer registration system. Classes were conducted twice a week with each session lasting one hour. The whole intervention period was eight weeks. There were a total of 52 participants for the study randomly assigned to either the games approach group (GAM) or the traditional approach group (TRD). The mean age for the GAM group was 17.8 years while the TRD group had a mean age of 16.6 years. There was no difference in playing experience between the groups.

Table 1. Demographic profile of the participants

Treatment	Male	Female	Mean Age	Mean Volleyball Experience (years)
GAM (n=25)	10	15	17.8	3.1
TRD (n=27)	16	11	16.6	3.6

2.2 Research Instruments

***2.2.1 Games Performance Assessment Instrument*:** For this study, the GPAI helped determine the participants' skill level for pre-testing and post-testing. This

instrument helped analyze the participant's decision-making determined by the execution for each phase of the volleyball game. The decision made was taught by the instructor during the intervention according to the pace and flow of each teaching method.

The GPAI has been used in volleyball in a 3-on-3 testing, with a reliability index ranging from r = 0.85 to 0.97. The construct validity of the instrument is capable of determining high and low performers and maintaining them as part of the data set.

***2.2.2 Raters and Judges*:** The raters/judges for the study were composed of three experienced and certified volleyball coaches, certified physical educators and practitioners of the sport. Prior to the pre-test, the raters used the GPAI together with the use of a video recorder. They also trained and reached a 100% inter-observer agreement (IOA) using the Kendall coefficient of concordance.

***2.2.3 Traditional Approach*:** The students in this group focused on learning specific volleyball skills. Teaching the sport's basic skills and then moving towards the tactics of the game, as explained by Reynaud (2011), was regarded as the traditional approach to volleyball. Majority of the class time was devoted to drills to develop the needed technical skills in volleyball. Lessons under this approach began with serving, passing with underhand, passing overhead, learning to spike and finally learning to block before progressing on to game tactics.

***2.2.4 Games Approach*:** The games approach in volleyball started by playing a modified game, discovering what the students need in order to play the game and then teaching the skills as instructed in Coaching Youth Volleyball (2007). The sequence for the lesson introduced the roles of players, the volleyball cycle, basic rules for positioning, rotation and team movement during games. Modified games of 3-on-3 were used to help understand the game and lessen movements and other factors related to the player errors. This also meant more contact with the ball for each individual inside the playing court.

2.3 Procedures of the Study

A pre-test session was conducted with both TRD and GAM approach groups through a 3-on-3 game for five minutes. There were five games to accommodate all students for 3-on-3 games which were also video recorded for added documentation and reference. The 3-on-3 games were suggested by Mitchell, Oslin and Griffin (2013) as it may give the subjects in the volleyball court a chance to receive, set and attack the ball with the three touch concept of volleyball.

After the pre-test, each of the two classes were assigned to either one of the groups. One class used the TRD approach and the other went through the

GAM approach. The post-test was at the same manner as the pre-test. All scores were recorded in the GPAI data chart.

2.4 Analysis of Data

Decision-making is the component that the GPAI seeks to obtain from appropriate or efficient responses over the sum of the total number of responses observed. The component score was calculated using the formula:

$$Component\ Score = \frac{Number\ of\ observed\ A/E\ responses}{Number\ of\ observed\ IA/IE + Number\ of\ observed\ A/E\ responses}$$

A paired t-test was used to determine if there were significant differences between the pre-test and post-test of the TRD and GAM groups. The level of significance was set at $\alpha = 0.05$.

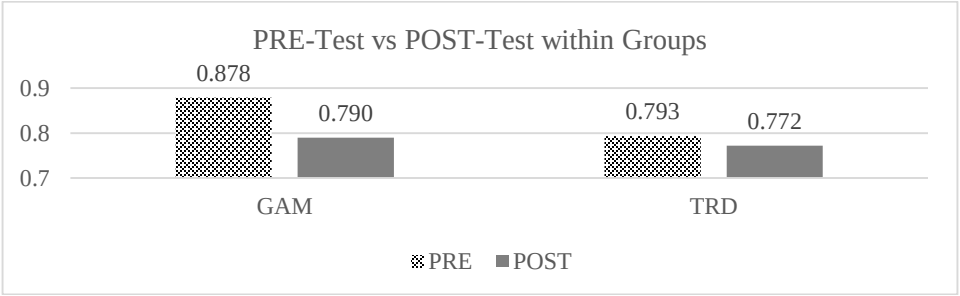
3. RESULTS

In this study, we set certain criteria to evaluate the participants' ability to execute the correct skills on the correct phase of a game. From that, decision-making was assessed as follows:

- Forearm pass or overhead pass on first touch to pass to a teammate.
- Set with underhand or overhead pass on second touch to a hitter.
- Overhead hitting action on third touch to send the ball over the net or to try and score a point.

Both GAM and TRD groups went through lessons that used all skills mentioned and were taught proper decision-making in each of the respective approaches. Figure 1 presents the pre-test and post-test mean scores of the GAM and TRD group for decision-making (DM).

Figure 1: Pre-test vs post-test decision-making (DM) scores within GAM group and TRD Group



Findings indicate that the decrease in the decision-making score is statistically significant from pre-test to post-test at α=0.05. The TRD group results showed a similar trend to the GAM approach with decreased decision-making scores from pre-test to post-test. However, unlike the decision-making score of the GAM approach, the difference in the TRD approach was not statistically significant. Table 2 shows the *t*-test results with mean pre-test and post-test scores of the GAM group and the TRD group.

Table 2. Paired T-test Results of GAM and TRD group using GPAI.

	GAM (n=25)				TRD (n=27)			
	Pre	Post	Difference	p	Pre	Post	Difference	p
DM	0.878	0.79	0.089	*0.045	0.793	0.772	0.021	0.564

* significant at α=0.05

Figure 2. Appropriate, inappropriate, and total attempt scores during pre-test and post-test of the games approach group

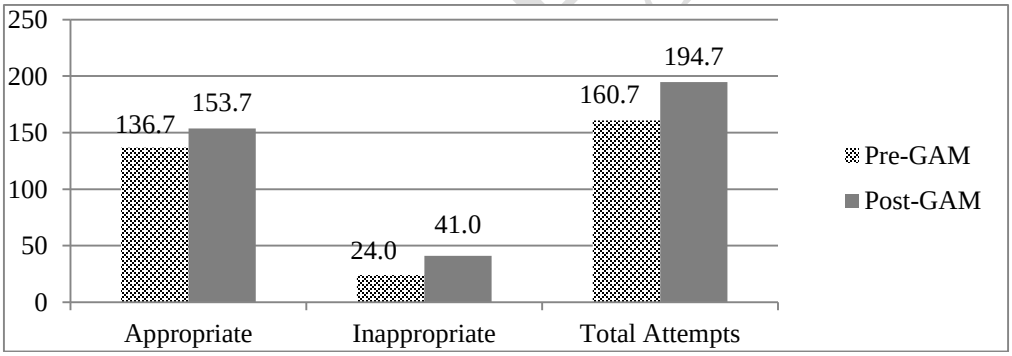


Figure 3. Appropriate, inappropriate, and total attempt scores during pre-test and post-test of the traditional group

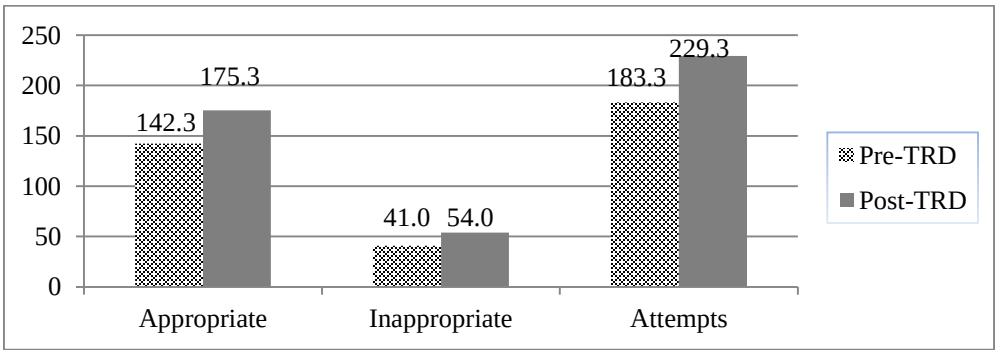


Table 2 below suggests that there were no significant differences within any of the tallied data from pre-test to post-test attempts and DM index scores. This may have been due to the time constraints of the intervention. The intervention time of one hour, twice a week, over an 8-week period may not have been enough to express significant changes in learning.

Table 2. Paired *t*-test of DM mean scores within GAM and TRD group

	P= (Appropriate)	P= (Inappropriate)	P= (Attempts)	P= (DM Index Score)
GAM	0.473	0.101	0.208	0.088
TRD	0.130	0.131	0.052	0.643

There were no significant differences in appropriate and inappropriate decision-making. However, through observation, there were many distinct trials wherein many of the students tried applying new knowledge and skills into actual games in the post test.

Decision-Making Gap: Questions arising from the results could be partly explained by the criteria set by the researcher and how the raters identified a decision-making attempt with the use of the GPAI. The "team fault" of having two or more players not deciding to get the ball due to miscommunication or simply because of the lack of time to react accordingly, occurred often. For the participants, their inexperience with the game made them not take any action at all. Since the action did not even show slight movements from the participants to move towards the ball to hit it, the raters scored it as a "team fault". Strictly speaking, it would be unreasonable to call a fault to one particular player when both players could have been involved. This particular situation was not mentioned with a distinct solution regarding the use of the GPAI, thus the raters' decision to not tally it in the rating sheet.

According to the FIVB's Volleyball Information System (VIS), the usual intra-observer agreement is to grant the statistic to the player when the ball goes towards the player or the player's area. The VIS does not have an option to give a fault to more than two players in a particular rally due to the VIS software's limitations. The only option to cover for such a situation is the "team fault". The use of the "team fault" was also considered by the raters in GPAI but chose not to tally it as an attempt. Initially, the raters addressed this as "team fault" with no consequences only to realize the repeated occurrence of the situation in a beginner educational setting. The players around the area should be responsible for having to attempt to get the volleyball and to be involved in the game rather than not attempting to hit the ball at all. The study followed its stated criteria, thus the results showed a decrease of scores in the game component of decision-making.

Many students in the GAM group were caught in this situation which may have caused them to have a statistical difference unlike the TRD group.

Decision-Making Outcome: At this juncture, one could conclude that the decrease in decision-making results may be attributed to the ongoing learning process. The decision-making index scores are important to know the appropriateness of decisions made yet with the ongoing learning process of decision-making, the increased number of attempts are equally as important for the learning process.

4. DISCUSSION

Although the students had undergone the intervention, the decision-making component for both groups stood out as not having an increase in scores within their respective groups. However, while the result may suggest a decrease in performance, there may have been some underlying progress that were not noticed through the evaluation of position. The participants responded towards the stimuli of the ball but could not always execute the correct response. Compared to their pre-test, students showed more involvement in the post-test instead of simply avoiding faults. The raters however were not able to identify such a response as a positive outcome.

A closer look at the graph represents a decrease in scores from the pre-test to post-test. The reason for the decrease in scores goes back to observation of the pre-tests. The participants' decision-making mostly happened at the start of the first ball reception. During the pre-test, there were often times where the participants made attempts in getting the volleyball only when it was served directly towards them. The students, through observation and review of video analysis, showed that a decision-making score can also be gained by being in a ready stance with a forearm pass or an overhead pass as the volleyball headed to the student's position and was touched by the student. If the ball had not gone exactly to their position, the decision-making score would be voided and not credited as an attempt.

When students were not going towards the ball and simply allowed the ball to land in between their teammates, this was recorded as a voided attempt. However, this kind of student's decision is uncommon in a regular tournament with trained players since seasoned volleyball players are trained to move towards the ball at a larger radius in relation to their position. Many of the students on the other hand would identify their area as simply where they exactly stood without having to take a step further. For the students who waited for the ball to go directly to them, their score was high but this was also due to not going after balls

that were far. In the practical setting, this is not desirable although as evaluated by the GPAI this would score high.

In the post-test, many of the participants had made more attempts, sought more trials and covered a bigger radius - one step or more around their standing position - to hopefully succeed with the use of the correct skill execution. Due to their eagerness, they covered more ground and were now moving towards the ball while also attempting to make successful skill executions. The post-test for both groups showed a different behavior as the students displayed more effort to apply what they had learned and that meant being more involved in as many decision-making, skill execution and adjustments as possible. Unfortunately, the GPAI had the inability to discriminate this improvement in a practical setting. The students' decision-making scores were instead shown to not improve despite this added in-game effort. The students often found themselves not reaching the ball and not executing the correct skill at the moment of ball contact. This resulted in an "attempt" but with an inappropriate outcome. Without the contact of the volleyball, the students were given an "inappropriate decision" rating.

The results present an illogical trend due to the decrease of scores as it is commonly known that during learning process, one's learning should increase over time (Ritter & Schooler, 2002). The discovery as to why this happened led the researchers to take a closer look into the data. Looking into the tally of the average scores, Figure 2 and Figure 3 show that more attempts (appropriate + inappropriate) on decision-making were made by both GAM and TRD groups in the post-test.

5. CONCLUSIONS

The decision-making of the students have definitely evolved from their pre-test and the intervention showed an increased willingness and effort to make adjustments for execution of skills during play. The results showed a decrease in decision-making scores for both groups over an 8-week intervention yet only because the students were probably still in the process of learning and training rather than reaching a level of mastery. A longer intervention period may have elicited more observable, favorable changes in decision-making and overall volleyball skill and, as such, is recommended by the researchers for future studies.

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