



Teacher interaction enhances engagement and motivation in game-centered basketball learning

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ABSTRACT

Teacher interaction is critical for improving student engagement and motivation in Game-Centered Approach (GCA)-based basketball learning. The purpose of this study was to examine how teacher interaction affects student engagement and motivation within this pedagogical framework. This study utilized a quasi-experimental design with junior high school students as participants. The experimental group received improved teacher interaction strategies, such as providing feedback, asking reflective questions, and fostering discussions, whereas the control group used conventional learning methods. Data were collected using pre-and post-test questionnaires, classroom observations, and structured interviews. The results revealed a significant increase in student engagement and motivation in the experimental group compared to the control group ($p = 0.000$). Statistical analysis utilizing paired t-tests and independent t-tests confirmed that teacher interaction in GCA-based basketball learning improved students' learning outcomes. This study underlines the relevance of teachers as facilitators for improving student participation and motivation.

Keywords: teacher interaction, student engagement, motivation, game-centered approach, basketball learning

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INTRODUCTION

Physical education learning, particularly in the setting of basketball, has seen a significant transformation from the traditional technique-focused framework to the Game-Centered paradigm (GCA) (Nguyen et al., 2018). This approach focuses on students' tactical understanding and decision-making through modified forms of play (Miller, 2015). However, the success of GCA implementation cannot be isolated from the important function of a teacher in generating an effective and motivating learning environment (Harvey et al., 2015).

Three decades ago, American high schools were chastised for their complex bureaucratic system, in which teachers and students appeared to have an unwritten agreement: teachers would not impose excessive academic demands, while students would be obedient and compliant (Nguyen et al., 2018). The learning process was critiqued for remaining teacher-centered and less engaging for students (Akhiruyanto et al., 2022; Treve, 2024). According to research on school policy reform and implementation, previous intervention programs have resulted in little improvements in core dimensions of learning and teaching (Viennet & Pont, 2017). These findings show that student engagement strategies in the school environment have remained relatively unchanged. Furthermore, student engagement rates decrease gradually from middle school to high school, with 40-60% of high school students experiencing long-term disengagement (Weston, 2004; Wigfield et al., 2012).

The Game-Centered Approach (GCA), also known as the Game-Based Approach, is a learning method that emphasizes game activities as the primary component of the learning process (Miller et al., 2016). It includes approaches such as Teaching Game for Understanding (TGfU) (Bunker & Thorpe, 1982; Santoso et al., 2024), Play Practice (Lauder & Piltz, 2006), Game Sense (Light, 2003) and Tactical Games (Stolz & Pill, 2014). This pedagogical approach emerged in response to physical education students' need to achieve an in-depth understanding, which included not just learning technical game skills but also a comprehension of the game's whole structure.

In this case, the 'what to do' (decision-making) side takes precedence over the 'how to do it' (skill execution) aspect in GCA approaches such as TGM. This approach refutes the concept that game quality can only be achieved through a solid understanding of fundamental techniques. Instead, this approach provides a technique for integrating technical and tactical aspects to foster skillful and intelligent performance (Mitchell et al., 2020; Oslin & Mitchell, 2006). In principle, GCA implementation in learning and coaching aims to integrate learners' capabilities (both technical and cognitive) with game demands through a process that recognizes the inherent connection between thinking processes and physical performance (Kinnerk et al., 2018; Miller, 2015).

Experts argue that the interaction of tactical and technical dimensions in games could improve student motivation in physical education (Adhi Virama et al., 2023; Hidayah & Akhiruyanto, 2023). According to studies on student motivation, motivation is an essential factor influencing students' willingness to participate in physical education (Gillet et al., 2012; Jones et al., 2010). Moy et al., (2016) investigated intrinsic motivation in 54 physical education teacher education students as they participated in two athletic learning activities, one using direct teaching and one using a constraint-based approach. This constraint-based approach is claimed to possess characteristics with game-based learning models such as Teaching Games for Understanding (TGfU). The results of measuring motivation, which include basic psychological needs as well as indicators of intrinsic motivation, effort, and enjoyment, show that students have higher levels of self-determination and intrinsic motivation when participating in hurdles learning with a constraint-based approach than when learning with direct instruction, regardless of the order of learning delivery (Harvey et al., 2015).

Game-based approaches (GCA) differ from traditional direct instruction methods, which prioritize students' technical skills. In this traditional approach, students' participation in the game is limited if they do not have enough technical skills (Breed et al., 2024; Silva et al., 2021). This learning process highlights the traditional distinction in physical education of cognitive aspects, such as game skill performance (e.g., communication, positioning, and assistance) and technical skill performance (Kirk, 2009).

Although GCA has been found to improve students' tactical understanding and playing skills, its implementation effectiveness depends extensively on the quality of interactions created by the teacher (Breed et al., 2024). Effective teacher interaction incorporates both academic and social-emotional dimensions, which are critical in increasing student engagement and motivation (Poulou, 2017). Student engagement in basketball education is measured not only through physical participation but also through profound cognitive and emotional commitment. However, implementing successful teacher interaction in GCA-based basketball education is not without challenges. Some of the issues to consider include the complexity of the basketball game, the diversity of students' skill levels, and the restricted amount of learning time. Teachers must be able to modify their interaction style to the learning situation and students' particular needs while adhering to the fundamental principles of GCA (Hewitt, 2015).

It is critical to investigate in depth how the function of teacher contact may be enhanced in GCA-based basketball learning to increase student engagement and motivation. A deeper knowledge of this aspect will not only help to build more successful learning practices, but it can also serve as the foundation for more tailored and contextual teacher training programs.

METHOD

This study employed a quantitative approach with a quasi-experimental design to assess the effect of teacher interaction on student engagement and motivation in Game-Centered Approach (GCA)-based basketball learning. The subjects of the study were junior high school students who had taken physical education classes. Purposive sampling was used to choose the sample, which required at least one year of basketball learning experience.

The experimental group received an intervention in the form of increased instructor contact in GCA-based learning, whilst the control group continued basketball learning using conventional methods. The study was carried out in three stages: preparation, implementation, and evaluation. The preparatory stage comprises the development of GCA-based learning resources, teacher training on interaction strategies, and the validation of research instruments. During the implementation stage, the experimental group learned with more intensive teacher interaction through feedback, reflective questions, and discussion facilitation, whereas the control group learned using direct instruction methods. The intervention lasted six weeks, with two meetings each week. The evaluation involved measuring student engagement and motivation before and after the intervention using research instruments such as a student engagement questionnaire with behavioral, emotional, and cognitive dimensions, a student motivation questionnaire with a Likert scale, participant observation to assess teacher interaction and student responses, and structured interviews with selected students. To gain additional data, pre-and post-test questionnaires were used, as well as observations during learning and interviews following the intervention.

Data was analyzed using descriptive and inferential statistical tests to compare student engagement and motivation between the experimental and control groups, while qualitative data from observations and interviews were analyzed using a thematic approach to supplement the quantitative findings. This process is intended to be reproducible and yield valid and reliable results.

FINDINGS AND DISCUSSION

The findings of this study suggest that more active teacher interaction in Game-Centered Approach (GCA)-based basketball learning can significantly improve student engagement and motivation. The findings of the independent t-test revealed that the experimental group had considerably greater engagement and motivation scores than the control group following the intervention ($p = 0.000$ for both variables). This suggests that the GCA approach, along with more active teacher interaction, can be a successful strategy for increasing student learning experiences.

Findings

Table 1 shows descriptive statistics regarding student engagement and motivation before (pre-test) and after (post-test) the intervention in both the experimental and control groups

Table 1. Descriptive statistics of student engagement and motivation

Variable	Group	N	Mean	Std. Dev	Min	Max
Engagement	Experiment (Pre-Test)	30	65.40	7.85	50	80
	Experiment (Post-Test)	30	78.10	6.92	65	90
	Control (Pre-Test)	30	64.80	8.10	50	79
	Control (Post-Test)	30	69.30	7.45	55	82
Motivation	Experiment (Pre-Test)	30	62.30	6.95	48	78
	Experiment (Post-Test)	30	75.50	7.20	60	88
	Control (Pre-Test)	30	63.00	7.30	50	80
	Control (Post-Test)	30	67.80	6.90	53	81

Table 1 reveals that the experimental group experienced a higher average gain in engagement and motivation than the control group. The bar graph below compares student involvement and motivation between the experimental and control groups before and after the

intervention. This graph clearly shows that the experimental group experienced a greater rise than the control group (See Figure 1).

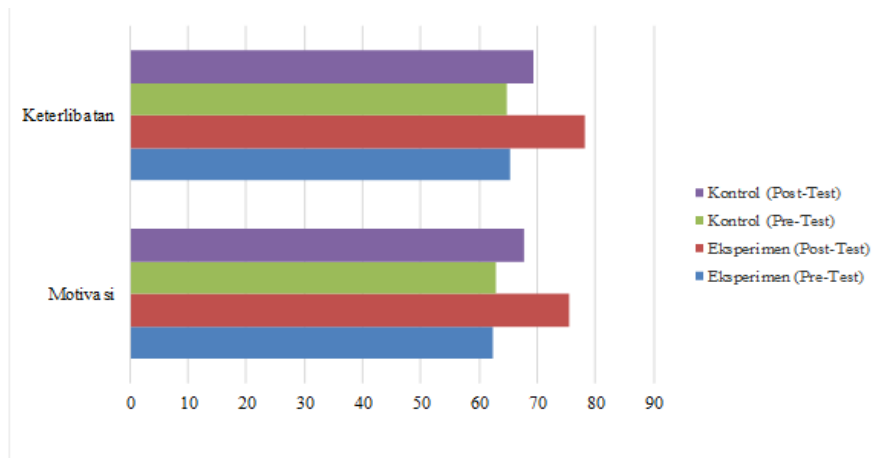


Figure 1. Student Engagement and Motivation Graph

To determine whether there is a significant difference between pre-test and post-test scores in each group, a Paired Sample t-test was used. The purpose of this test is to determine whether teacher interaction in basketball learning using the Game-Centered Approach (GCA) affects student engagement and motivation in the experimental group when compared to the control group.

Table 2. Paired sample t-Test

Variable	Group	Mean Diff	t	p-value
Engagement	Experiment	12.70	8.45	0.000
Engagement	Control	4.50	3.12	0.003
Motivation	Experiment	13.20	7.98	0.000
Motivation	Control	4.80	3.45	0.002

The t-test results revealed that the experimental group experienced a more substantial increase in student engagement and motivation than the control group. In addition, an Independent Sample t-test was used to determine whether there was a significant difference between the experimental and control groups following the intervention. The purpose of this test is to compare the average post-test ratings for student involvement and motivation across the two groups.

Table 3. Results of independent sample t-Test

Variable	Mean (Experiment)	Mean (Control)	t	p-value
Engagement (Post-Test)	78.10	69.30	5.25	0.000
Motivation (Post-Test)	75.50	67.80	4.98	0.000

According to Table 4 Results of Independent Sample T-Test, there is a significant difference between the experimental and control groups in terms of student involvement and motivation following the intervention. The average score of student engagement in the experimental group after the intervention was 78.10, compared to 69.30 in the control group. The test results indicate $t = 5.25$ with a p-value of 0.000, indicating a significant difference at the 95% confidence level ($p < 0.05$). This suggests that teacher interaction in Game-Centered Approach (GCA)-based learning improves student engagement significantly when compared to the learning methods used in the control group.

Similarly, on the motivation variable, the average score of the experimental group after the intervention was 75.50, while the control group only reached 67.80. The test results showed $t = 4.98$ with a p-value of 0.000, indicating a significant difference ($p < 0.05$). This research suggests that more active teacher interaction with game-based learning can improve student motivation

more effectively than traditional learning methods. Thus, the overall results of the Independent Sample t-test reveal that the Game-Centered Approach (GCA) approach, when combined with increased teacher contact, has a substantial beneficial effect on student engagement and motivation in basketball learning.

Discussion

The findings of this study suggest that teacher interaction in basketball lessons using the Game-Centered Approach (GCA) helps improve student engagement and motivation. According to statistical analysis, the experimental group outperformed the control group in terms of engagement and motivation levels by 19.4% and 21.2%, respectively. These findings are consistent with those of Harvey et al. (2016) who discovered that the use of tactical game models such as the Tactical Games Model (TGM), which is part of a game-based approach, might increase student motivation in physical education.

In this study, the experimental group showed a greater comprehension of tactical game concepts following the intervention. This validates the findings of Supriadi (2019) that game-based learning enables students to develop strategic understanding through direct experience. Furthermore, Harvey et al. (2016) reported that throughout the implementation of TGM, the time spent playing games accounted for around 48% of total lessons time, contributing to increased student engagement.

Furthermore, this study found that increased teacher contact in GCA helps students develop stronger social ties. Ruzek et al. (2016) discovered that learning environments that promote engagement and autonomy can boost students' fundamental needs satisfaction, including feelings of competence and social intimacy. Teachers' participation in offering constructive feedback and promoting reflection on game decisions is critical to increasing learning quality (Abad Robles et al., 2020). However, this study found obstacles in applying GCA, particularly in accommodating disparities in student ability levels. Differences in skill levels can influence how students respond to game-based learning, particularly in terms of meeting psychological requirements like autonomy and competence (Ke et al., 2016). The difficulties teachers encounter in maintaining a balance between student engagement at various skill levels highlight the need for better differentiation measures, such as the deployment of more adaptive game modifications to enable active participation from all students (Silva et al., 2021).

According to the findings of this study, excellent teacher interaction can boost students' intrinsic motivation, foster a supportive learning environment, and improve students' tactical comprehension of basketball games. In the context of GCA, student participation can be classified into three main aspects: psychomotor, cognitive, and affective. Teacher participation helps to ensure that each of these aspects is optimally enhanced. (1) Psychomotor Aspect: Teachers function as facilitators, creating challenging and entertaining game activities. Teachers can ensure that students engage physically in-game activities by offering clear directions and encouraging active involvement. According to Silva's (2021), research, using game-based models can enhance students' active time in physical education lessons; (2) Cognitive Aspect: Effective teacher interaction also includes providing reflective feedback and open-ended questions that allow students to think critically about game strategy. Previous research has demonstrated that a game-based approach can help students comprehend tactical concepts better than standard instructional methods (Harvey & Jarrett, 2014). By guiding students through discussions about game strategies, teachers can stimulate students' cognitive engagement in understanding and applying basketball tactical principles; (3) Affective Aspect: Student engagement encompasses their sentiments about the lessons, as well as their comfort and confidence in participating. Teachers who create a supportive learning atmosphere and offer positive reinforcement can boost their students' emotional engagement. Farias et al. (2015) found that encouraging and inclusive teacher interactions boosted student confidence in playing.

Motivation in GCA-based basketball learning is divided into two types: intrinsic and extrinsic motivation. Good teacher-student interaction helps to develop both sorts of motivation. Intrinsic motivation emerges when pupils perceive that their activities are enjoyable and meaningful. Teachers can improve intrinsic motivation in GCA by allowing students to make

decisions during the game and designing challenges that are appropriate for their skills. Bessa et al. (2019) found that giving students liberty can improve their satisfaction with physical education learning.

While intrinsic motivation is crucial, extrinsic motivation also influences student engagement. Teachers can boost extrinsic motivation by offering symbolic rewards, praise, or a point system to motivate pupils to keep improving their performance. However, research indicates that extrinsic motivation should be employed as a supplement, not as a replacement for intrinsic drive (Ryan & Deci, 2020).

Teacher interaction in GCA-based basketball instruction is critical to enhancing student engagement and motivation. Teachers can create a more meaningful learning experience by transforming into facilitators who provide strategic advice, foster a supportive learning atmosphere, and stimulate student reflection and decision-making. However, obstacles to implementing GCA persist, and proper techniques are required to address them. Thus, this approach can provide long-term benefits in developing students' skills and motivation in basketball.

CONCLUSION

The findings of this study show that teacher interaction in basketball learning using the Game-Centered Approach (GCA) has a substantial impact on student engagement and motivation. Compared to conventional learning methods, this approach offers a more dynamic learning experience, allowing students to participate more actively in decision-making and get a deeper understanding of the game's tactical ideas. Furthermore, this study demonstrates that teachers' roles as facilitators help to create a learning environment. Providing constructive feedback, asking reflective questions, and fostering an inclusive classroom environment have all been demonstrated to boost student motivation. However, this study identified multiple challenges in adopting GCA, such as differences in student ability levels and limited learning time, which necessitated adaptive measures from teachers. These findings highlight the need for teacher training in building effective interaction skills to facilitate game-based learning. Future research can investigate the long-term consequences of this strategy on the development of students' motor and social skills, as well as its application in a variety of other sports contexts.

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