The Influence of GSRS in Learning Basketball Game Activities on Students' Learning Experience

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Abstract

This study examines the impact of the application of Game based Student Response systems (GSRS) in basketball learning on student learning experience. Using a quasi-experimental design with the Pretest-Posttest One Group Design model, the study involved 34 7th grade students of State Junior High Schools 14 Bandung KU 12-13 years old who were selected through random sampling techniques. Data were collected using questionnaire instruments and analyzed using the Paired T-Test statistical test through SPSS version 26. The results showed a significant improvement in the students' learning experience after the implementation of GSRS, with an average posttest score higher than the pretest ($p<0.05$). The increase can be seen in the aspects of active involvement, material understanding, and student learning motivation. The results of the study show that the implementation of GSRS has a positive and significant influence on students' learning experience, which is reflected in increased grades and a more even distribution of abilities among students. These findings indicate that GSRS is an effective method in improving the quality of students' learning experience in basketball learning. This research makes an important contribution to the development of physical education learning strategies that integrate digital technology, especially in the context of basketball learning at the junior high school level in effectively improving the quality of student learning experience. These findings provide implications for the development of physical education learning strategies that are more adaptive to the needs of the digital native generation in the future.

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INTRODUCTION

Physical education is defined as a subjects designed to develop students› physical and mental abilities (Y. B. Wang et al., 2025). Physical education in schools contributes to general and individualized training as well as personal development so that they often show more satisfactory academic achievement (Russo et al., 2025). Through physical education, students can not only grow physical skills but also in the cognitive realm, students are invited to think, analyze, plan, and evaluate various situations they face (Hinton et al., 2016). This can stimulate critical thinking and reflection that enriches students› learning experience in the cognitive realm (Rocamora et al., 2019). This study aims to explore the influence of Game Based Student Response System (GSRS) in improving students› learning experience in basketball.

Basketball is a very popular sport in the world, basketball is a very technical sport and there are various complex tactics in the process of playing basketball such as walking, running, jumping, elements of strength, speed and flexibility, this complexity makes learning basketball in school requires the right learning approach so that students can master both technical and tactical aspects at the same time (Huang & Wu, 2025). However, in practice, the learning method of basketball in schools still tends to be dominated by traditional technical approaches that focus on motor movement exercises with one-way communication from teacher to student, students are often directly directed to drill on the court without getting an initial understanding of the correct concept of play (Caruso et al., 2025).

The selection and use of appropriate learning methods in the basketball learning process, especially to ensure that students can master physical skills, the development of effective methods is an important need (Zhen & Wang, 2024). This is especially true in basketball learning which has its own complexity, students with low cognition tend to take a long time to achieve learning targets because they have difficulty understanding and applying the material taught (Zhang, 2024).

Game Based Student Response System (GSRS) is an interactive and game-based learning platform, GSRS facilitates active learning by incorporating digital elements of quizzes such as Quizizz about basketball games through gadgets before practicing them on the field (Fernandez-Rio et al., 2020). This creates «Blended Learning» that enhances students› learning experience in basketball game activities due to the interaction of teacher-student and student-student interaction and supports the development of analytics such as problem-solving, gamified GSRS can improve between students and encourage active student participation driven by the competitive aspects of gamification (Cameron & Bizo, 2019).

GSRS has emerged as one of the pedagogical innovations in the digital era (Ismail & Mohammad, 2017). The Quizizz platform has transformed a static classroom atmosphere into a dynamic, competitive, and fun learning environment In contrast to conventional audience response systems that tend to be functional, GSRS is deliberately designed to harness the intrinsic motivation generated by games, thereby encouraging the participation and engagement of all students and providing more equitable support (Bower & Sturman, 2015).

The use of GSRS in the pre-practicum phase that studies basketball tactics with Quizizz before going to the court creates a strong cognitive foundation (Heppy Hein Wainggai et al., 2025). Students come to the practice sessions with a better conceptual understanding, which allows teachers to use field time to improve physical skills and tactical application rather than just teaching the basics of theory (Consoli et al., 2023).

Gamification in education has been extensively researched as a way to increase motivation and engagement, gamification brings a positive competitive atmosphere in the classroom thus encouraging students to put more effort into understanding the material in order to get the best results reward elements and instant feedback of games such as challenges, and interactive feedback creates a dynamic learning environment that encourages active participation(Antle & McLaren, 2024). This is in line with the purpose of physical education in shaping meaningful learning experiences through activities that involve interaction, collaboration, and active participation of students (Cibrian et al., 2022).

Students› technical skills in basketball are seen as central, without which the development of technical skills students› understanding and learning outcomes will be limited (Bozkurt, 2018). The technical skills learned are usually placed in an increasingly dynamic and competitive learning environment where learning is given the opportunity to combine technical and cognitive skills in a more dynamic form (Muangsrinoon & Boonbrahm, 2019).

Research (Priante & Tsekouras, 2025)

found that GSRS increased student learning outcomes in physical education learning by 13.3%, especially for students with low achievement. Quizzes have a strong relationship with students› learning experiences on physical education theory, students have a significant impact on their learning process as quizzes can encourage students to try different learning approaches and experiment with different methods (A. I. Wang, 2015).

Student learning experience is a collection of event processes experienced by everyone, especially students in a certain scope to be able to take advantage of available resources both inside and outside the classroom, one of which is the learning platform, namely Quizizz (Sunday et al., 2025). These quizizz not only teach students what they know, but also help them learn the skills necessary to succeed in physical education, modern life, and academics (Zuhri et al., 2024).

This research will explore the influence of innovative learning methods that integrate technology and the concept of Game Based Student Response System (GSRS) on the learning experience of student at various levels of education. By paying attention to aspects such as participation rates, motivation, material comprehension, and interaction, this study aims to provide new insights into how technology can increase students' active engagement. Using quantitave approach, as well as relevant statistical analysis, this study will produce empirical data showing significant differences in learning experiences compared to conventional learning methods.

Based on the problems that have been described, physical education learning, especially in basketball games, still faces several challenges, especially in the aspect of understanding tactical and technical concepts which are often less paid attention when learning is more focused only on physical exercises, this causes learning to be not fully effective (Sukowati & Sartono, 2020). With this approach very potential in supporting adaptive and personalized learning, students are given the opportunity to learn according to their needs and abilities so that they get space to repeat and understand the material in the form of more communicative and interactive games (A. I. Wang, 2015).. The purpose of this research is to explore and analyze how meaningful learning experiences can increase student engagement in the learning process. This reseach aims to identify the factors that support students in thinking critically, exploring material, and enganging emotionally, as well as to understand

their impact on students' academic undertanding and achievement. In addition, this study wants to show the importance of a shift form one-way learning to more dynamic and collaborative interactions.

METHOD

This study uses a quantitative approach with a quasi experimental design. Before the implementation of GSRS, a pre-test was carried out to measure student understanding, followed by learning using GSRS, and ended with a post-test to analyze changes.

The application of GSRS using gamified quizzes, GSRS emphasizes game-based learning designed for simple basketball game materials that focus on techniques such as passing or dribbling. GSRS specifically refers to a reflection session conducted after a game activity, in which students and teachers reflect on experiences to improve understanding and skills. The implementation of GSRS in learning aims to make students more active, critical

The population in this study is 7th grade students of State Junior High Schools 14 Bandung with the number of samples taken, namely 34 people with an average age of 12-13 years, the selection of samples with this age range is based on the characteristics of students who are in this age stage, students are classified as early adolescence who have high curiosity, love to explore, and are starting to get used to using technology in daily life. Therefore, this group is considered appropriate to be given learning treatment that uses digital media such as GSRS. This study uses ssimple random sampling, simple random sampling is a technique of sampling from a population that is carried out randomly without paying attention to the strata in that population.

The data collected in this study uses research instruments, namely Student Learning Experience Questionnaire (SLEQ) On a Likert scale of 5 points (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree). The questions in the questionnaire include 6 main indicators: teaching quality, clear goals and standards, workload, assessment, general skills and learning community. A total of 22 items with very high validity test scores due to confirmatory factor analysis (confirmatory factor analysis/ CFA) (Kember & Leung, 2009). It is used to ensure that this instrument measures the construct in question. The results of the analysis showed that this six-dimensional model had a good goodness-of-fit, which indicated high construct validity,

while the reality test value was 0.70 using the test Cronbach'alpha. Students fill out questionnaires that have been entered into the Google Form to measure the student's learning experience.

Data analysis was carried out in 4 stages, namely: Descriptive, Paried T-Test, Normality test. All data were calculated using the help of SPSS version 26.

$$O1 \rightarrow X \rightarrow O2$$
Research Design

Information:
O1 = Pre-test
X = Treatment
O2 = Post-test

RESULTS AND DISCUSSION

This study aims to analyze the influence of GSRS on students' learning experience in teaching bsaket ball game activities at State Junior High Schools 14 Bandung. Student learning experience in the context of physical education is not only related to physical abilities, but also includes motivation, involvement, understanding of concepts, social interaction and the ability to apply knowledge in game activities, therefore, effective learning does not only emphasize the delivery of material but must also be able to provide a meaningful and enjoyable learning experience, which can be explained as follows:

Table 1. Description of statistical data

	N	Min	Max	Std. Deviation
Pretest	34	82	87	2.711
Posttest	34	83	89	1.365
Valid N (listwise)	34			

Based on the **Table 1** results of data analysis, it was found that there was a significant increase between pretest and posttest scores after learning was applied using GSRS. This was proven by conducting a descriptive test that showed an increase in minimum and maximum values and a decrease in standard deviation in posttest values. These findings indicate that the use of GSRS is able to increase the understanding and equitable distribution of students' abilities in basketball learning.

Based on **Table 1** it can be seen that the minimum value increases from 70 to 83, while the maximum value rises from 82 to 89. An increase in the minimum score of 13 points is an important indicator that students with low initial ability benefit positively from learning using

GSRS. The increase in maximum grades also reflects that students with high abilities continue to experience ability development.

The standard deviation which dropped from 2,711 to 1,356 shows that students' scores have become more homogeneous. This means that the variation in students' abilities between individuals is getting smaller because all students get the same opportunity to understand concepts through the use of GSRS. Thus, learning using GSRS creates an inclusive learning experience, not only effective for students with high academic ability, but also for those who were previously less able to follow the material.

The results of the normality test show that the data has a significant pretest value of 0.166 and posttest 0.128, both greater than 0.05. Therefore, it is concluded that the data is normally distributed so that it meets the assumptions of the parametric test, to test the difference in pretest and posttest scores, a Paired Sample T-Test is carried out. This proves that there is a significant difference between the value before and after the implementation of GSRS.

The results of the Paired Sample T-Test, the significance value (sig. 2-tailed) is .001<.005 which means, so that Ho is rejected and H1 is accepted, so there is a significant difference between the results before and after the GSRS treatment. By contrast, empirical data prove that GSRS interventions have a significant impact on students' learning experience, this shows that several previous studies have found that GSRS is able to increase students' concentration, engagement, and understanding in the learning process.

The results of the study showed a significant increase in students' abilities after the implementation of GSRS in learning. This is shown through a comparison of pretest and posttest scores with a sample of 34 students. Based on the results of descriptive statistical analysis (**Table 1**), the minimum value increased from 70 to 83 and the maximum value increased from 82 to 89. This increase indicates that the GSRS intervention is able to improve the achievement of learning outcomes for all students, especially in students with low abilities whose standard deviation scores from 2,711 to 1,356 show an increase in homogeneity and a more even distribution of values among students, so that the ability gap is smaller.

In this study, the quiz is described as a game-based student response system (GSRS) that can adapt the learning experience to the needs of the digital native generation in the future (Nikou & Economides, 2018). This research can help

students to better understand tactical and technical at the same time through GSRS because it provides a strong foundation for students in understanding and mastering the game of basketball as a whole, this aspect creates more effective and meaningful learning for students (Plump & La-Rosa, 2017).

In addition to the cognitive aspect, GSRS has an influence on social interaction. When answering the quiz, students discuss, correct each other's answers, and even cooperate in solving problems (Yılmaz, 2021). This helps to build confidence in expressing opinions, good communication skills, and a supportive learning environment. With the growth of the role of students in learning, teachers are no longer the only information center, but rather facilitators in the learning process (Bozkurt, 2018).

Creating a positive learning environment, especially related to the positive effects on students' learning experience as well as the activation of the use of GSRS in learning concentration, this approach can show how the integration of GSRS can function as a formative assessment tool in physical education, by measuring student understanding in real-time and adjusting teaching as needed, this can be beneficial for students and teachers.

Students today are a digital generation that is close to gadgets, and interactive media. The presence of GSRS makes them see that technology is not only for entertainment, but can be an effective means of learning because it presents a new learning experience (Awedh et al., 2014). This integration is a need for the 21st century where literacy is an important ability for students (Jaramillo & Chiappe, 2024).

New creativity creates innovative ideas and solutions for physical education with collaborative learning to achieve the crucial goal of emphasizing student cooperation, initiative, and decision-making. Therefore, it is very important for teachers to use learning methods that can develop both innovative ideas (Heppy Hein Wainggai et al., 2025).

In traditional learning approaches, students are often less engaged when teachers deliver theoretical material, especially related to the concepts of tactics and sport techniques because they tned to be one-way, where students act as passive listeners thus triggering less of their interest and motivation (Rueda et al., 2017). However, with the existence of GSRS, students' attention can be more focused because each individual is required to be directly involved in answering the questions given through their gadgets, gamifi-cation elements such as scores, time limits, and player rangkings, create positive competition that encourages students to be more focused and feel challenged to achieve the best results and student can know their strengths and weaknesses in understanding the material, which allows them to proactively make improvements (Pan et al., 2015).

The results show that the formulation of the research problem has been answered, namely that the application of GSRS has a significant influence on students' learning experiences in basketball learning. The positive influence in question can be seen from the aspects of active participation, understanding of game concepts, technical and tactical skills, and student learning motivation during learning.

Some limitations in this study only used a single group design that did not have a control group, so there is a possibility that the results were influenced by factors other than the intervention given. This study only involved the same class with a small sample of N=34 students by conducting field experiments only 6 times due to time constraints.

Despite these weaknesses, this research still makes an important contribution to the physical education literature, especially in the application of game-based learning technology. Based on the results of this study, there are several recommendations or development suggestions for further research.

Research suggestions conducted in the future can further develop gamification elements in the GSRS design used such as additional leaderboards, personal avatars, achievement badges, and video-based tactical analysis to improve a more interactive and immersive learning experience.

In addition, it is hoped that further research can expand the research sample such as using quasi-experimental design with a control group so that the causal relationship between the research variables can be more objective and the duration of the intervention effect in the long term. In addition, advanced research such as different levels of education such as elementary school, high school, and higher education because each level has different characteristics of cognitive and social development. Thus, it can be assessed to what extent the effectiveness of GSRS applies in various levels of physical education learning.

CONCLUSION

One of the innovations in physical edu-

cation learning that is growing is the use of digital technology through a game-based learning platform or known as the Game Based Student Response System (GSRS). The application of GSRS in this study shows that the integration of technology is not only a complement to learning, but also serves as a driving force to improve the quality of students' learning experience.

This research contributes to the academic literature and physical education practice, related to the use of digital technology as a means of formative assessment. The advantage of GSRS in providing direct feedback allows teachers to evaluate the extent of students' understanding of the material that has been taught before starting the practice of games in the field. Teachers can identify concepts that students have not yet learned and improve learning strategies quickly and on target. In other words, GSRS functions as a learning progress monitoring tool that is very useful in sports learning.

In this study, the author shows the importance of examining the integration of technology in physical education as a critical research area for information systems research. The authors found through field experiments that the use of GSRS in physical education improves students' learning experience especially in those who are underperforming in the cognitive domain, although GSRS increases concentration, participants, relative motivation, and overall student satisfaction, this study adds to the literature on practical guidance for educators, teachers, and educational organizations in encouraging the adoption of technology in physical education in the future.

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