

THE IMPACT OF USING INTERACTIVE MULTIMEDIA IN TEACHING BASIC BADMINTON TECHNIQUES TO IMPROVE COGNITIVE LEARNING OUTCOMES AND SELF-REGULATED LEARNING OF PHYSICAL EDUCATION STUDENTS

Luh Putu Tuti Ariani^{1)*}, Ni Wayan Marti²⁾

¹⁾ Sport Coaching Education, Ganesha Education University, ²⁾Software Engineering Technology, Ganesha Education University

¹⁾tuti.ariani@undiksha.ac.id, ²⁾marti@undiksha.ac.id

ABSTRAK

Proses pembelajaran menuntut sumber daya manusia berkualitas tinggi yang berkembang seiring waktu. Pengembangan teknologi sangat penting bagi proses pembelajaran dalam bentuk media. Multimedia interaktif adalah alat yang dilengkapi dengan kontrol yang dapat dijalankan oleh pengguna sesuai keinginan. Media interaktif ini dapat memfasilitasi pembelajaran, menjadikannya pendorong untuk meningkatkan hasil pembelajaran dan pembelajaran yang diatur sendiri. Tujuan studi ini adalah untuk menentukan efek menggunakan multimedia interaktif dalam mengajarkan teknik bulu tangkis dasar untuk meningkatkan hasil pembelajaran kognitif dan pembelajaran yang diatur sendiri di antara siswa pendidikan fisik di FOK Undiksha. Penelitian ini menggunakan desain eksperimental dengan desain grup kontrol hanya pasca-ujian. Sampel dipilih menggunakan acak sederhana sampling melalui metode undian. Instrumen untuk mengukur hasil pembelajaran meliputi tes keterampilan bulu tangkis dasar dan kuisioner untuk menilai pembelajaran yang diatur sendiri. Analisis Data untuk tes hipotesis diperlukan tes prekondisi, yaitu normalitas dan homogen/f-test. Setelah melakukan tes pra-kondisi ini, tes hipotesis dilakukan dengan menggunakan tes yang berbeda. Hasil menunjukkan bahwa penggunaan media interaktif memiliki dampak yang tinggi pada hasil pembelajaran kognitif dan pembelajaran yang diatur sendiri dalam teknik bulu tangkis dasar. Sebagai kesimpulan, ada perbedaan signifikan dalam hasil pembelajaran teknik bulu tangkis dasar dan pembelajaran yang diatur sendiri antara siswa pendidikan jasmani di FOK

Sejarah Artikel

Dimasukkan : 15 Juni 2024
Direview : 8 Juli 2024
Diterima : 14 Agustus 2024
Disetujui : 30 Oktober 2024

Kata-kata Kunci:

Media interaktif, hasil belajar, pembelajaran mandiri

Article History

Submitted : June 15, 2024
Reviewed : July 8, 2024
Accepted : August 14, 2024
Published : October 30, 2024

Keywords:

Interactive Media, Learning Outcomes, Self-Regulated Learning

Abstract. The learning process demands high-quality human resources that evolve with the times. Technological development is essential for the learning process in the form of media. Interactive multimedia is a tool equipped with controls that can be operated by users as desired. This Interactive Media can facilitate learning, making it a stimulus to improve learning outcomes and self-regulated

learning. The purpose of this study is to determine the effect of using interactive multimedia in teaching basic badminton techniques to improve cognitive learning outcomes and self-regulated learning among Physical Education students at FOK Undiksha. This research uses an experimental design with The Posttest-Only Control Group Design. The sample was selected using simple random sampling through a lottery method. The instruments for measuring learning outcomes involved a test of basic badminton skills and a questionnaire for assessing self-regulated learning. Data analysis for hypothesis testing required precondition tests, namely normality and homogeneity/F-tests. After conducting these precondition tests, hypothesis testing was carried out using a difference test. The results showed that the use of interactive media had a high impact on cognitive learning outcomes and self-regulated learning in basic badminton techniques. In conclusion, there is a significant difference in the learning outcomes of basic badminton techniques and self-regulated learning between Physical Education students at FOK Undiksha who were taught using interactive multimedia and those who were taught using conventional methods.

INTRODUCTION

The rapid development of computer technology today has been felt across various sectors of life. In the field of education, it is not only used for administration but also serves as an alternative medium for teaching. The use of media can stimulate interest in learning and encourage students to delve deeper into their studies (Istiqlal, 2017). The accuracy in selecting the right media impacts the ease of absorbing information or knowledge.

Technological advancements have influenced the learning process. The role of technology in badminton training is still limited, considering the appropriate badminton methods from simple to complex (Xiong & Li, 2022). The anticipated learning process should use educational media to ensure that teaching and learning activities run effectively. Creative use of media can streamline and enhance learning efficiency, helping to achieve educational goals (Kurniawati & Nita, 2018). Students' abilities to receive and process material and information vary, necessitating breakthroughs through technological advancements. Interactive media facilitate the interaction, communication, and delivery of material effectively and efficiently. Interactive multimedia promotes self-directed learning by providing clear and comprehensive tutorials. The interactive media used are of high quality because they meet the criteria of validity and practicality. The advantage of interactive media is its broad and personalized interaction, catering to different learning strategy needs (Mustika et al., 2018). This media is seen as a communication tool that bridges abstract ideas with the real world (Kurniawati & Nita, 2018). The communication component in interactive multimedia (computer-based) involves the relationship between humans (as users) and computers (software/applications in DVD format). Thus, the expected product fosters a two-way relationship between the software and its users. Interactivity in multimedia involves user engagement with the application program. Interactive information applications aim for users to obtain only the desired information without consuming everything (Tarigan & Siagian, 2015). Several studies indicate that the use of interactive media can enhance concept mastery

through Android utilization (Ferawati dalam Kurniawati 2018). Self-regulated learning is a perspective on students taking responsibility for their learning, being active in efforts to improve their academic performance (Sutikno, 2017). Its implication in the learning pattern is to be applied to students. Students can utilize various relevant learning resources, choose and determine learning strategies, evaluate the learning process and outcomes, and develop their self-concept. Independent learning does not mean learning alone but rather learning without depending on others, attempting to solve problems independently without waiting for answers from others (Rindiani et al., 2023). Self-regulated learning (SRL) is essential for all students to manage and discipline themselves and to develop learning abilities willingly. One new concept emerging to improve the quality of learning is self-regulation (Öz & Şen, 2018). Through interactive multimedia with comprehensive features related to basic badminton techniques, self-regulated learning can be facilitated.

In the Physical Education, Health, and Recreation program, there is a Badminton Learning course that covers basic technique materials. In the learning process, which aligns with the demands of the 21st century, there is a need for human resources to evolve in accordance with the times, requiring improvement, evaluation, and adaptation to needs (Mustafa, 2020). Thus far, the teaching of basic badminton techniques has utilized conventional systems, providing direct explanations or face-to-face interactions, followed by demonstrations and the provision of teaching materials. Subsequently, students practice the techniques repeatedly. Through interactive media, it is hoped that students can independently practice according to the materials they have not yet mastered and determine their own study time. Mastery of basic badminton techniques requires repeated independent practice.

Badminton is a sport favored by the Indonesian population, making the availability of facilities and infrastructure easily accessible. Additionally, its notable achievements have brought honor to the nation, making badminton popular in Indonesia. Continuous development efforts are necessary to maintain these achievements. One such developmental effort, supported by technological advancements, aims to introduce badminton through education in schools and universities. With interactive multimedia covering basic badminton techniques, it is hoped to positively influence learning outcomes and self-regulated learning among students in the Physical Education, Health, and Recreation program during the badminton learning course. Based on the aforementioned background, the research problem addressed in this study is: Is there a difference and influence on the cognitive learning outcomes and self-regulated learning of Physical Education, Health, and Recreation students at FOK Undiksha, when taught using interactive multimedia compared to conventional media.

METHODS

This research adopts a quasi-experimental design, specifically a Pretest-Posttest Control Group design (Tuti Iriani, Rosmawita Saleh, 2022). The research design is illustrated in Figure 1.

<i>Group</i>	<i>Pretest</i>	<i>Treatment</i>	<i>Posttest</i>
Eksperimen (E)	O ₁	X	O ₂
Kontrol (K)	O ₃	-	O ₄

Figure 1. Research Design

In this study, treatments were classified into three categories: subject matter, learning models, and timing of implementation. The subject matter involved in this research is the fundamental techniques of badminton. The use of learning models was differentiated between conventional learning models for the control group and direct learning models using interactive media for the experimental group. This study was conducted within the Physical Education and Recreation program at Ganesha Education University in Singaraja-Bali during the fourth semester, comprising four classes: IV A, IV B, IV C, and IV D. The total number of students involved was 87. Sampling was done using simple random sampling via lottery. The sampling process proceeded as follows: two classes were randomly selected from the four available classes, each assigned as either the experimental or control group. From these two classes, one was designated as the experimental group taught using interactive media, and the other as the control group taught using conventional learning methods. The dependent variables in this study were cognitive learning outcomes in basic badminton techniques, as indicated by test scores, and self-regulated learning, as indicated by quiz scores. The independent variable was the use of interactive multimedia in teaching basic badminton techniques for the experimental group, while conventional learning methods were used for the control group. Data collection techniques included: (1) cognitive learning outcomes obtained from skill tests (Nurhasan, 2003), and (2) self-regulated learning assessed through questionnaires adapted or modified from (Wahyudi et al., 2022). Based on the study of theories regarding students' self-regulated learning abilities, six indicators were formulated: (1) independence from others, (2) self-confidence, (3) discipline, (4) sense of responsibility, (5) initiative-driven behavior, and (6) self-control. The instrument for self-regulated learning consisted of 20 Likert-scale items with five response options: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). Data analysis was conducted using one-way MANOVA with a significance level of 0.05.

RESULTS AND DISCUSSION
Results

1. Description of Basic Badminton Techniques Learning Outcomes Data

The measurement results of cognitive learning outcomes in basic badminton techniques for the group of students using interactive media have an average of 87.81, whereas for the group of students using conventional media, the average is 74.48. This means that the average cognitive learning outcomes in basic badminton techniques for students using interactive media are classified as very high, while those using conventional media are classified as high.

2. Description of Self-Regulated Learning Outcomes Data

The measurement results of self-regulated learning for the group of students using interactive media average 83.74, whereas for the group of students using conventional media, the average is 66.48. This means that the average self-regulated learning outcomes for students using interactive media are classified as high, while those using conventional media are classified as moderate.

3. Normality Test of Data Distribution

The normality test was conducted on the group of learning outcomes in basic badminton techniques and self-regulated learning of Physical Education and Recreation students at FOK Undiksha, based on the use of interactive and conventional media in basic badminton technique learning. The results of the normality test are presented in Table 1.

Table 1. Normality Test of Data Distribution

Data Group	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistik	Df	Sig.	Statistik	Df	Sig.
Y ₁₁	0,138	27	0,200	0,971	27	0,640
Y ₁₂	0,161	27	0,072	0,937	27	0,100
Y ₂₁	0,135	27	0,200	0,974	27	0,711
Y ₂₂	0,161	27	0,072	0,937	27	0,100

Table 2. The Data on The Influence of Interactive Media and Conventional Media

Statistik	Media	
	Interactive	Conventional
N	27	27
$\bar{X}$	87,81	74,48
SD	5,22	12,98

Explanation:

Y11 = Learning outcomes in basic badminton techniques of Physical Education and Recreation students at FOK Undiksha taught using interactive multimedia.

Y12 = Learning outcomes in basic badminton techniques of Physical Education and Recreation students at FOK Undiksha taught using conventional media.

Y21 = Self-regulated learning outcomes of Physical Education and Recreation students at FOK Undiksha taught using interactive multimedia.

Y22 = Self-regulated learning outcomes of Physical Education and Recreation students at FOK Undiksha taught using conventional media.

The results of the normality test as shown in Table 4 indicate that both the Kolmogorov-Smirnov and Shapiro-Wilk statistics have significance values greater than 0.05. Therefore, overall, the distribution of data for learning outcomes in basic badminton techniques and self-regulated learning can be considered normal.

4. The Impact of Interactive Multimedia in Basic Badminton Techniques Learning on Cognitive Learning Outcomes for Physical Education and Recreation Students at Undiksha

Based on the analysis, the influence of using interactive multimedia on the cognitive learning outcomes in basic badminton techniques of Physical Education and Recreation students at FOK Undiksha yielded a statistical F-value of 8.292 with a significance level smaller than 0.05. Therefore, the null hypothesis stating no difference in learning outcomes between students taught with interactive multimedia and those taught with conventional media is rejected. In other words, there is a significant difference in the learning outcomes of basic badminton techniques among Physical Education and Recreation students at FOK Undiksha when taught using interactive multimedia compared to conventional media.

5. The Impact of Interactive Multimedia in Basic Badminton Techniques Learning on Self-Regulated Learning Outcomes for Physical Education and Recreation Students at Undiksha

Based on the analysis, the influence of using interactive multimedia on self-regulated learning of Physical Education and Recreation students at FOK Undiksha yielded a statistical F-value of 5.128 with a significance level smaller than 0.05. Therefore, the null hypothesis stating no difference in self-regulated learning outcomes between students taught with interactive multimedia and those taught with conventional media is rejected. In other words, there is a significant difference in the self-regulated learning outcomes of Physical Education and Recreation students at FOK Undiksha when taught using interactive multimedia compared to conventional media.

Discussion

The use of interactive media has a significant impact on learning outcomes in the badminton learning course, which covers basic techniques such as racket grip, footwork, and stroke techniques. Learning outcomes represent the range of changes before and after participating in learning activities. Media can provide motivation and stimulation for new learning (Ahmadiyanto, 2016). The characteristics of badminton game media must master these basic techniques so that players can perform well in badminton. The learning process uses learning resources that are easy to achieve its goals. Interactive media is a learning material that utilizes technological advances and is used to convey learning messages such as knowledge, skills, and attitudes that can stimulate thinking patterns, attention, willingness, and feelings in the learning process so that intentional learning processes can occur, be controlled and purposeful and can affect learning outcomes (Arif Ashfahany et al., 2017). Teachers use media as intermediaries in delivering materials so that they can be understood well by their students (Rizki Wahyuningtyas, 2023). The electronic revolution cannot be denied to be one of the causes of changing the lifestyles and patterns of human life today. Computerization which is a visual manifestation of the operational world of digital which is experiencing rapid development (Andinny & Lestari, 2016). The use of interactive multimedia computer technology allows the learning process to become real, there is information that enters the mind or consciousness of humans through the senses. The advantages of this interactive multimedia according to (Munadi 2010 dalam Ashfahany 2016) are that it can provide an affectionate climate, individually, increase learning motivation, provide feedback, and its utilization control lies with its users.

Meanwhile, those who use conventional methods rely on interests, talents, abilities, and potentials possessed by students that may not develop optimally without the assistance of a teacher. The role of the teacher is narrowed down to being merely an object. It is teacher-centered and proceeds in a one-way direction. In practice, the teacher presents facts and explains while students are only given the opportunity to receive, take notes, listen, and

memorize what is given by the teacher (Fahrudin et al., 2021). Conventional learning tends to be monotonous, verbal, and relies on lectures in the presentation process. This will impact students' learning outcomes.

Learning badminton using interactive media is considered highly effective in terms of self-regulated learning. The aspect of self-regulated learning is crucially applied by students as it enhances learning outcomes and independence. In the process of self-regulated learning, students need to regulate themselves, set learning goals, create learning plans, select learning strategies, monitor the learning process, evaluate learning outcomes, provide feedback, and enhance their own learning. Students who can engage in self-regulated learning have clear ideas. In both online and offline learning situations, independent learning is necessary, thus the use of interactive media is highly beneficial. This media allows repeated searching and is equipped with text, images, and videos. The multimedia used, interactive multimedia, is a learning application that utilizes technological advancements to deliver learning messages such as knowledge, skills, and attitudes, stimulating students' minds, attention, and willingness to learn intentionally and actively (Ashfahany, 2016). The general aim of education is to produce individuals who are intellectually independent. Intellectual independence, a goal of education, can be achieved through various learning strategies in education. Independence is a crucial aspect possessed by every individual, enabling them to face challenges without relying on others (Mita, Emi Sulistri, 2022). Self-regulated learning actively manages motivational aspects involving the willingness to learn. Increased motivation is assumed to enhance learning abilities, directing someone towards self-directed learning and aiding achievement. Self-directed learning is also known as learning with one's own initiative or learning without assistance from others. Through self-initiative, individuals can apply knowledge in both formal education and personal goals (Tampubolon, 2020). Successful learning processes require independence. Characteristics of each student include learning initiative, setting learning goals, monitoring, organizing, and controlling performance, viewing difficulties as challenges, seeking and utilizing relevant learning sources, choosing and applying learning strategies, evaluating the learning process and outcomes, and maintaining self-concept (Kidjab et al., 2019).

CONCLUSION

Based on the research findings and discussion, the following conclusions can be drawn: There is a difference in learning outcomes of basic badminton techniques among Physical Education and Recreation students at FOK Undiksha, influenced by self-regulated learning using interactive multimedia compared to conventional teaching methods.

REFERENCES

- Ahmadiyanto, A. (2016). Meningkatkan aktivitas dan hasil belajar siswa menggunakan media pembelajaran Ko-RUF-SI (Kotak Huruf Edukasi) Berbaris Word Square pada materi kelas VIIIC SMP Negeri 1 Lampihong tahun pelajaran 2014/2015. *Jurnal Kependidikan Kewarganegaraan*, 6(2), 983–984.
- Andinny, Y., & Lestari, I. (2016). Pengaruh pembelajaran multimedia terhadap hasil belajar matematika. *JKPM (Jurnal Kajian Pendidikan Matematika)*, 1(2), 169–179.
- Ashfahany, F. A., Adi, S., & Hariyanto, E. (2017). Bahan ajar mata pelajaran Pendidikan Jasmani Olahraga dan Kesehatan dalam bentuk multimedia interaktif untuk siswa kelas VII. *Prosiding Seminar Nasional Peran Pendidikan Jasmani Dalam Menyangga Interdisipliner Ilmu Keolahragaan*, 366–376.
- Ashfahany, F. A., Adi, S., & Hariyanto, E. (2016). Pemanfaatan multimedia interaktif dalam Pendidikan Jasmani Olahraga dan Kesehatan. *Prosiding Seminar Nasional Peran Pendidikan Jasmani Dalam Menyangga Interdisipliner Ilmu Keolahragaan*, 366–376.
- Fahrudin, F., Ansari, A., & Ichsan, A. S. (2021). Pembelajaran konvensional dan kritis kreatif dalam perspektif Pendidikan Islam. *Hikmah*, 18(1), 64–80.
- Istiqlal, M. (2017). Pengembangan multimedia interaktif dalam pembelajaran matematika. *JIPMat*, 2(1).
- Kidjab, M. R., Ismail, S., & Abdullah, A. W. (2019). Deskripsi kemandirian belajar dalam pembelajaran matematika SMP. *Euler: Jurnal Ilmiah Matematika, Sains Dan Teknologi*, 7(1), 25–31.
- Kurniawati, I. D., & Nita, S. (2018). Media pembelajaran berbasis multimedia interaktif untuk meningkatkan pemahaman konsep mahasiswa. *DoubleClick: Journal of Computer and Information Technology*, 1(2), 68.
- Mita, E. S. M. (2022). Analisis kemandirian belajar siswa pada mata pelajaran IPS kelas VI SDN 12 Singkawang. *Jurnal X*, 430–435.
- Mustafa, P. S. (2020). Kontribusi kurikulum Pendidikan Jasmani, Olahraga, dan Kesehatan di Indonesia dalam membentuk keterampilan era abad 21. *Jurnal Pendidikan: Riset Dan Konseptual*, 4(3), 437–452.
- Mustika, M., Sugara, E. P. A., & Pratiwi, M. (2018). Pengembangan media pembelajaran interaktif dengan menggunakan metode Multimedia Development Life Cycle. *Jurnal Online Informatika*, 2(2), 121.
- Nurhasan. (2003). Tes dan pengukuran pendidikan olahraga (Drs. Nurhasan, M.Pd.).
- Öz, E., & Şen, H. Ş. (2018). Self Regulated Learning Questionnaire: Reliability and validity study. *Educational Policy Analysis and Strategic Research*, 13(4), 108–123.
- Rindiani, D., Fitriyanti, Rahmantika, L. E., & Oktaviani, R. P. (2023). Analisis kemandirian belajar pada pembelajaran matematika siswa kelas VII SMP Amal Mulia 2 Cileungsi. *Original Research*, 58, 389–398.
- Rizki Wahyuningtyas, B. S. S. (2023). Pentingnya media pembelajaran dalam meningkatkan hasil belajar di sekolah dasar. *Lentera: Jurnal Ilmiah Kependidikan*, 16(1), 73–80.

- Sutikno. (2017). Kontribusi Self Regulated Learning dalam pembelajaran. *Jurnal Sains Dan Seni ITS*, 6(1), 51–66.
- Tampubolon, B. (2020). Motivasi belajar dan tingkat belajar mandiri dalam kaitannya dengan prestasi belajar mahasiswa. *Jurnal PIPSI (Jurnal Pendidikan IPS Indonesia)*, 5(2), 34.
- Tarigan, D., & Siagian, S. (2015). Pengembangan media pembelajaran interaktif pada pembelajaran ekonomi. *Jurnal Teknologi Informasi & Komunikasi Dalam Pendidikan*, 2(2), 187–200.
- Tuti Iriani, R., Saleh, R., & Masdayaroh. (2022). Effectiveness of the use of multimedia-based learning media in building construction courses. *Jurnal PenSil*, 11(1), 1–9.
- Wahyudi, W., Jumadi, J., & Nurhidayah, D. A. (2022). Implementasi instrumen kemandirian belajar mahasiswa untuk meningkatkan prestasi belajar di masa pandemi COVID-19. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(1), 925–932.
- Xiong, S., & Li, X. (2022). Intelligent strategy of Internet of Things computing in badminton sports activities. *Wireless Communications and Mobile Computing*, 2022.