

COMPARISON OF THE EFFECTIVENESS OF USING
BAAMBOOZLE AND CONCRETE MANIPULATIVE LEARNING
MEDIA ON STUDENTS' LEARNING OUTCOMES
IN THE SKI SUBJECT AT MAN 3 MATARAM

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Abstract

The limited comparative research on digital game-based learning media and concrete manipulative media in improving students' learning outcomes in Islamic Cultural History (*Sejarah Kebudayaan Islam*/SKI) at the *madrasah* level highlights the need for evidence-based evaluation of interactive instructional approaches. This study aims to analyze the comparative effectiveness of Baamboozle learning media, concrete manipulative media, and conventional teaching methods on students' SKI learning outcomes at MAN 3 Mataram. A quantitative quasi-experimental design with a posttest-only control group approach was employed. The sample consisted of 72 students selected through random sampling and divided into three groups: the Baamboozle experimental group, the concrete manipulative experimental group, and the control group. Data were collected using a cognitive learning achievement test consisting of 40 multiple-choice items and analyzed using descriptive statistics, normality and homogeneity tests, One-Way ANOVA, and Tukey HSD post hoc analysis with SPSS 24. The findings revealed significant differences among the three instructional groups, with the Baamboozle group achieving the highest learning outcomes. The ANOVA results showed a statistically significant difference among groups, $p < .001$, and the Tukey HSD analysis demonstrated that the Baamboozle group significantly outperformed both the concrete manipulative and control groups. These findings indicate that Baamboozle-based learning media are more effective in improving students' SKI learning outcomes by

promoting active participation and learning motivation through game-based activities. This study contributes to Islamic education by providing empirical evidence on the value of technology-integrated learning and supports the use of interactive digital media to enhance instructional quality in *madrasah* classrooms.

Keywords: Baamboozle; Game-Based Learning; Concrete Manipulative Media; Islamic Cultural History; Learning Outcomes.

INTRODUCTION

The rapid development of digital technology has transformed educational practices worldwide, particularly in the selection and implementation of instructional media that encourage active student engagement and meaningful learning experiences. In the context of twenty-first-century education, digital game-based learning has emerged as an innovative pedagogical approach capable of increasing students' motivation, participation, and academic achievement. International studies have demonstrated that game-based learning platforms such as Baamboozle significantly improve student engagement and learning outcomes by creating interactive, competitive, and enjoyable learning environments compared to conventional instructional approaches (Wardani & Kiptiyah, 2024). Similarly, Khayyirah et al., (2024) argued that Baamboozle-assisted game-based learning effectively improves students' cognitive achievement because it encourages active participation, collaboration, and learning motivation throughout classroom activities. In addition, digital game-based learning has been recognized internationally as an effective strategy for enhancing student engagement and conceptual understanding across various disciplines in the digital education era (Adipat et al., 2021). These findings indicate that digital interactive media have become increasingly relevant for modern educational environments that demand collaborative, student-centered, and technology-integrated learning.

In the Indonesian educational context, the integration of innovative instructional media remains an important challenge, particularly in Islamic education subjects such as Sejarah Kebudayaan Islam (SKI). Learning outcomes in SKI classes are frequently reported to be relatively low due to the dominance of monotonous instructional methods and the limited use of interactive learning media in *madrasah* classrooms (Fikroh & Ashoumi, 2025). SKI, as a component of Islamic Religious Education, aims to help students understand Islamic history and civilization while shaping their worldview and moral values

through historical reflection Lestari et al., (2022). However, the implementation of SKI learning often relies heavily on teacher-centered lecture methods that limit students' participation and reduce classroom engagement. Arsyad (2019) emphasized that instructional media function as essential tools for delivering messages, information, and learning experiences capable of stimulating students' thoughts, feelings, interests, and attention during the learning process. Therefore, the selection of appropriate instructional media plays a fundamental role in improving students' understanding and academic performance.

The need for innovative instructional strategies is increasingly important because contemporary students tend to prefer learning experiences involving technology, visualization, competition, and direct interaction. Previous studies revealed that Baamboozle-based learning media positively affect students' learning outcomes and classroom participation. Rohmah and Puspasari, (2025) found that the Active Learning Type Quiz Team model assisted by Baamboozle significantly improved students' learning achievement. Likewise, Yuniar et al., (2023) concluded that Baamboozle effectively assists students in understanding learning materials more deeply and attractively. Adelia et al., (2025) further reported that game-based learning media such as Baamboozle create enjoyable classroom environments that positively influence student engagement. Similarly, Wulandari et al., (2025) demonstrated that Baamboozle increases students' learning interest and academic achievement because it facilitates interactive and competitive learning experiences. In language learning contexts, Walidaina et al., (2024) also reported that the use of Baamboozle significantly improved students' English vocabulary achievement compared to conventional instruction.

Beyond digital learning media, concrete manipulative media continue to play an essential role in facilitating meaningful learning experiences, especially in subjects requiring contextual and historical understanding such as SKI. Sari & Ramadan, (2025) explained that concrete instructional media remain highly relevant because they help students directly understand learning materials through real experiences. This perspective is supported by Sutrisno et al., (2019), who stated that manipulative concrete media effectively improve students' conceptual understanding and thinking skills because learners engage directly with learning activities. Likewise, Laelasari, (2018) emphasized that concrete manipulative media help students comprehend concepts through authentic experiences, making learning more meaningful and memorable. These findings indicate that both digital interactive media and

concrete manipulative media possess unique pedagogical strengths that may contribute differently to students' learning outcomes.

The urgency of integrating innovative learning media in Indonesian education is also supported by broader educational developments. Setiawan and Suwandi, (2022) explained that the Indonesian government has implemented two major approaches in curriculum-oriented textbook development, namely government-produced textbooks and private publisher textbooks aligned with national educational standards. They further highlighted the importance of integrated learning approaches connecting educational philosophy, science integration, and instructional practices. In addition, Agustin and Keguruan, (2021) argued that children's fundamental potential should be developed from an early age through meaningful educational activities because children naturally possess strong capacities for growth and development. This perspective reinforces the importance of instructional strategies that actively engage learners and create meaningful educational experiences.

Several previous studies have examined the effectiveness of Baamboozle and other digital instructional media in various educational contexts. Anwar et al., (2025) found that the implementation of Baamboozle in Fiqh learning significantly increased students' participation and learning achievement after two classroom action research cycles. Albert, (2024) similarly reported that digital interactive media in Islamic Religious Education significantly improved students' motivation, engagement, and understanding. Mariani et al., (2022) revealed that Baamboozle positively influenced junior high school students' learning achievement and learning interest in hybrid learning environments. Furthermore, Riwulang et al., (2026) found that Baamboozle-based learning media positively affected MTs students' mathematics learning outcomes because interactive game-based learning increased student activity and understanding. Wahyuningsih et al., (2023) also concluded that Problem-Based Learning assisted by Baamboozle edugame improved students' critical thinking skills and learning interest through more engaging instructional processes. Likewise, Irawati et al., (2025) reported that Problem-Based Learning assisted by Baamboozle significantly improved students' achievement in learning systems of linear equations. Kajori and Hendriana, (2023) further demonstrated that Problem-Based Learning assisted by Baamboozle significantly enhanced students' mathematical communication skills by creating collaborative, active, and enjoyable learning environments.

Although numerous studies have examined the effectiveness of Baamboozle-assisted learning, previous research has predominantly focused on mathematics, language learning, economics, and Islamic jurisprudence subjects. In contrast, limited studies have specifically investigated the comparative effectiveness between Baamboozle digital media and concrete manipulative learning media in the context of SKI learning at the madrasah level. Moreover, previous studies have generally emphasized single-media implementation rather than comparative analysis between digital interactive media and concrete manipulative media. Therefore, a significant research gap remains regarding which type of instructional media is more effective in improving students' learning outcomes in SKI subjects, particularly within Islamic senior high school contexts.

This study is theoretically grounded in several classical learning theories relevant to instructional media implementation. Skinner's behaviorism theory explains that learning occurs through stimulus-response relationships strengthened by reinforcement mechanisms (Skinner, 1953). In Baamboozle-based learning, quizzes, rewards, and competition function as stimuli capable of encouraging active student responses and improving learning outcomes. Piaget's constructivist theory further emphasizes that knowledge is constructed through direct interaction with the environment, making concrete manipulative media important for facilitating meaningful learning experiences (Piaget, 1970). Bandura's social learning theory also supports collaborative learning processes through observation, interaction, and peer competition during Baamboozle-assisted activities (Bandura, 1977). Furthermore, Dale's Cone of Experience theory suggests that direct and participatory learning experiences are more memorable and understandable than purely verbal instruction (Dale, 1969). Finally, Ausubel's meaningful learning theory highlights that new knowledge becomes more meaningful when connected to students' prior experiences and cognitive structures (Ausubel, 1968). Collectively, these theories provide a strong conceptual foundation for comparing the effectiveness of Baamboozle and concrete manipulative learning media in improving students' learning outcomes.

Preliminary observations conducted on August 10, 2025 at MAN 3 Mataram revealed that SKI learning remains dominated by lecture-based instruction, where teachers verbally explain materials while students passively listen and take notes. During classroom observations, many students appeared unenthusiastic, passive, and disengaged, with some showing signs of boredom such as drowsiness, inattentiveness, and unrelated conversations during instructional activities. Student responses to teacher questions were also minimal,

indicating low classroom participation and limited learning motivation. These conditions suggest that conventional lecture-based instruction is insufficient for addressing the learning preferences of contemporary students who are more attracted to technology-based, interactive, and visually engaging learning experiences. Consequently, innovative instructional strategies integrating interactive digital media such as Baamboozle and concrete manipulative learning media are needed to improve student engagement and learning outcomes effectively.

Based on these issues, this study aims to compare the effectiveness of using Baamboozle and concrete manipulative learning media on students' learning outcomes in the SKI subject at MAN 3 Mataram. The study seeks to provide empirical evidence regarding which instructional media are more effective in enhancing students' academic achievement in Islamic Cultural History learning while contributing to the development of innovative instructional strategies in Islamic education contexts.

METHODS

1. Research Type and Approach

This study employed a quantitative research approach because the collected data were numerical and statistically analyzed to determine the effects of instructional treatments on students' learning outcomes. Quantitative research is appropriate for studies aiming to examine relationships, differences, and causal effects among variables through objective measurement and statistical procedures (Sugiyono, 2019). The present study aimed to investigate the effectiveness of Baamboozle learning media, concrete manipulative learning media, and conventional instruction on students' learning outcomes in the Sejarah Kebudayaan Islam (SKI) subject at MAN 3 Mataram. Therefore, the quantitative approach was considered suitable because it enables structured and standardized measurement of students' academic achievement.

The research type used in this study was quasi-experimental research. Campbell and Stanley (1963) explained that quasi-experimental research is conducted when researchers do not have full control over the random assignment of participants into experimental and control groups. Nevertheless, quasi-experimental studies still allow researchers to provide different treatments and compare their effects on dependent variables (Emzir, 2016). This

study adopted quasi-experimental procedures because the classes involved had already been established administratively by the school, making random assignment impractical.

2. Research Design

The study utilized a Posttest-Only Control Group Design within a quasi-experimental framework. According to Sugiyono (2019), this design involves providing treatments to experimental groups and administering posttests after the treatment process without conducting pretests beforehand. In this research, three groups were involved:

- a. Experimental Group 1 received instruction using Baamboozle digital game-based learning media.
- b. Experimental Group 2 received instruction using concrete manipulative learning media.
- c. The control group received conventional instruction using lecture-based teaching methods.

The design was selected because it allowed the researcher to compare the effectiveness of different instructional media in improving students' cognitive learning outcomes in the SKI subject. Fraenkel et al. (2015) stated that non-equivalent control group designs are appropriate for educational settings where naturally formed classes are used as research groups.

The implementation of the experimental design is presented in Table 1.

Table 1. Experimental Design

Group	Treatment	Posttest
Experimental 1	X ₁ (Baamboozle)	O ₁
Experimental 2	X ₂ (Concrete Manipulative Media)	O ₂
Control	Conventional Learning	O ₃

In this study, One-Way ANOVA analysis was used to determine whether significant differences existed among the three instructional groups.

3. Population and Sample

Population refers to a generalization area consisting of subjects or objects possessing particular characteristics determined by researchers for investigation and conclusion drawing (Sugiyono, 2022). The population of this study consisted of students enrolled in the SKI subject at MAN 3 Mataram during the 2025/2026 academic year. The target population specifically involved tenth-grade students because they shared similar academic characteristics and learning contexts relevant to the study objectives.

The population data are presented in Table 2.

Table 2. Population Distribution

Class	Number of Students
Class 1A	15
Class 1B	15
Class 2 IPA	23
Class 2 IPS	19

The sampling technique employed in this study was random sampling. Random sampling is a sampling technique in which each member of the population has an equal opportunity to be selected as a sample, thereby minimizing bias and increasing representativeness (Sugiyono, 2019). The sampling process was conducted through random selection methods such as lottery procedures and random number generation using Microsoft Excel.

- a. Three classes were selected as research samples:
- b. Experimental Class 1 using Baamboozle learning media.
- c. Experimental Class 2 using concrete manipulative learning media.
- d. Control Class using conventional instructional methods.

The concrete manipulative learning media included historical maps, Walisongo character cards, and mosque miniatures related to the topic “The Spread of Islam in the Indonesian Archipelago.”

4. Research Setting and Time

This study was conducted at MAN 3 Mataram, located in Mataram City, West Nusa Tenggara, Indonesia. The research was implemented during the even semester of the 2025/2026 academic year, specifically from December 2025 to March 2026.

The school was selected because it had implemented technology-based learning and possessed facilities supporting the use of interactive and manipulative instructional media. Preliminary observations conducted on August 10, 2025, indicated that SKI learning activities were still predominantly lecture-centered, causing low student participation and learning motivation.

5. Research Variables

Research variables are objects or attributes determined by researchers to be studied and analyzed in order to obtain information and draw conclusions (Sugiyono, 2022). This study involved two categories of variables: independent variables and dependent variables.

a. Independent Variables

1) Baamboozle Learning Media (X_1). This variable referred to instructional treatment using the Baamboozle digital game-based learning platform as interactive media during SKI instruction.

2) Concrete Manipulative Learning Media (X_2). This variable referred to instructional treatment using physical learning objects such as Islamic dissemination maps, Walisongo figure cards, and mosque miniatures related to the topic of the spread of Islam in Nusantara.

b. Dependent Variable

Dependent Variable was Students' Learning Outcomes in SKI (Y). Students' learning outcomes were measured through cognitive posttest scores obtained after the implementation of instructional treatments.

6. Research Instruments

Research instruments are tools used to collect data for answering research questions or testing hypotheses (Emzir, 2020). In this study, the primary instrument used was a cognitive learning achievement test.

a. Learning Achievement Test

The learning achievement test was administered to measure students' cognitive abilities after receiving different instructional treatments. Sudjana (2017) explained that learning achievement tests are used to evaluate students' mastery of instructional content after learning activities.

The posttest instrument consisted of 40 multiple-choice questions related to the topic "The Arrival and Development of Islam in the Indonesian Archipelago." The test items were developed based on revised Bloom's taxonomy cognitive levels, including understanding (C2), applying (C3), and analyzing (C4).

Table 3. Blueprint of Learning Achievement Test

No	SKI Material	Cognitive Indicator	Cognitive Level	Item Type	Number of Items
1	Arrival of Islam in Nusantara	Students analyze theories regarding the arrival of Islam in Indonesia	C4 (Analyzing)	Multiple Choice	10
2	Development of Islamic Kingdoms	Students compare the roles of Demak and Samudra Pasai Kingdoms	C4 (Analyzing)	Multiple Choice	10
3	Role of Walisongo	Students identify Walisongo preaching strategies	C3 (Applying)	Multiple Choice	10
4	Islamic Heritage and Traditions	Students explain Islamic cultural and artistic heritage in Indonesia	C2 (Understanding)	Multiple Choice	10

b. Instrument Validity

Instrument validity was tested using Pearson Product Moment correlation analysis. Arikunto (2018) explained that validity testing is conducted to determine whether test items appropriately measure the intended construct. Test items with correlation coefficients exceeding the *r*-table value at a significance level of 0.05 were categorized as valid.

c. Instrument Reliability

Instrument reliability testing was conducted using Cronbach's Alpha formula. The instrument was considered reliable if the alpha coefficient exceeded 0.70, indicating acceptable internal consistency among test items.

7. Data Collection Techniques

Data collection was conducted using cognitive posttests administered after the implementation of instructional treatments. Sudjana (2017) stated that objective tests are effective instruments for measuring students' mastery of instructional materials after learning activities.

The posttest scores obtained from the Baamboozle group, concrete manipulative media group, and control group were subsequently analyzed statistically to identify differences in students' learning outcomes.

8. Data Analysis Techniques

Data analysis refers to the process of organizing and interpreting data into meaningful information for answering research questions and testing hypotheses (Sugiyono, 2022). This study utilized descriptive and inferential statistical analyses.

a. Descriptive Statistics

Descriptive statistics were used to describe the distribution of posttest scores in each group. The descriptive statistical data included: (a) Mean scores; (b) Standard deviations; (c) Minimum scores; (d) Maximum scores. These statistics were used to describe the general tendencies and score variations among the Baamboozle, concrete manipulative, and control groups.

b. Inferential Statistics

Inferential statistics were employed to test the research hypotheses and determine whether significant differences existed among the three groups.

c. Prerequisite Tests

1) Normality Test

The normality test was conducted to determine whether the data were normally distributed, which is a requirement for parametric statistical analysis such as One-Way ANOVA (Sugiyono, 2019).

The Kolmogorov–Smirnov test was used in this study through SPSS software. Ghozali (2018) explained that the Kolmogorov–Smirnov test is commonly used to compare sample distributions with theoretical normal distributions.

The decision criteria were as follows:

- a) If Sig. > 0.05, the data were normally distributed.
- b) If Sig. $\leq$ 0.05, the data were not normally distributed (Riduwan & Sunarto, 2017).

2) Homogeneity Test

Homogeneity testing was conducted using Levene's Test for Equality of Variances to determine whether the variances among groups were homogeneous. Ghozali (2021) stated that homogeneity testing is required before conducting One-Way ANOVA because ANOVA assumes equal variances among groups.

Field (2018) explained that Levene's Test is widely used for examining homogeneity among multiple groups.

The decision criteria were:

- 1) If $p\text{-value} > 0.05$, the variances were homogeneous.
- 2) If $p\text{-value} \leq 0.05$, the variances were not homogeneous.

If the variances were not homogeneous, Games-Howell post hoc analysis was used instead of Tukey HSD.

d. Hypothesis Testing

Hypothesis testing in this study aimed to determine whether significant differences existed among students' learning outcomes in the Baamboozle group, concrete manipulative media group, and control group.

The primary statistical test used was One-Way ANOVA. Sugiyono (2019) explained that One-Way ANOVA is suitable for comparing mean scores among three or more independent groups.

The hypotheses were formulated as follows:

- 1) Null Hypothesis (H_0)

There is no significant difference in students' learning outcomes among the Baamboozle group, concrete manipulative media group, and control group.

$$\text{Uji T: } t = (\bar{x} - \mu) / (s / \sqrt{n})$$

- 2) Alternative Hypothesis (H_1)

There is a significant difference in students' learning outcomes among at least two groups.

H_1 : At least two μ are significantly different

The significance level used in this study was $\alpha = 0.05$.

- a) If $p\text{-value} < 0.05$, H_0 was rejected.
- b) If $p\text{-value} \geq 0.05$, H_0 failed to be rejected (Kim, 2017).

The ANOVA formula used was:

A. Uji T: $t = (\bar{x}_1 - \bar{x}_2) / \sqrt{(s_1^2/n_1 + s_2^2/n_2)}$
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e. Post Hoc Test

Post hoc testing was conducted only if the One-Way ANOVA results indicated significant differences among groups. Santoso (2021) explained that post hoc tests are used to identify which groups significantly differ after overall ANOVA significance is detected.

If the homogeneity assumption was fulfilled, Tukey HSD analysis was used. However, if the homogeneity assumption was violated, Games-Howell analysis was employed.

The data analysis procedures involved: Entering posttest scores into SPSS software, Conducting normality and homogeneity tests, Performing One-Way ANOVA analysis, Comparing significance values with $\alpha = 0.05$, Drawing conclusions based on statistical results (Field, 2013).

The ANOVA test formula used was:

$$B. \quad F = MS_b / MS_w$$

9. Research Hypotheses

According to Emzir (2020), research hypotheses are temporary answers to research problems whose validity must be tested statistically. Kerlinger (2000) further explained that hypotheses are scientific predictions developed from theories and previous studies.

The hypotheses tested in this study were:

- 1) H_0 (Null Hypothesis): There is no significant difference in effectiveness between Baamboozle learning media and concrete manipulative learning media on students' SKI learning outcomes at MAN 3 Mataram.
- 2) H_1 (Alternative Hypothesis): There is a significant difference in effectiveness between Baamboozle learning media and concrete manipulative learning media on students' SKI learning outcomes at MAN 3 Mataram.

RESULTS

1. Instrument Prerequisite Testing

a. Instrument Validity Test

The instrument was distributed to 72 respondents or students from a different research location. The researcher conducted the instrument validity testing at MAN 1

Mataram. Subsequently, the respondents' answers were analyzed using SPSS version 24 with a significance level of $\alpha = 5\%$, resulting in an r-table value of 0.231.

The decision criteria were as follows: if the calculated correlation coefficient (r-count) was greater than the r-table value at the 5% significance level, the item was considered valid. Conversely, if the r-count was lower than the r-table value, the item was considered invalid. Based on the validity testing conducted by the researcher, all instrument items were declared valid, as presented in the following table.

Table 4. Instrument Validity Test Results

No	r-count	r-table	Valid / Invalid
1	0,298	0,231	Valid
2	0,414	0,231	Valid
3	0,345	0,231	Valid
4	0,446	0,231	Valid
5	0,399	0,231	Valid
6	0,458	0,231	Valid
7	0,431	0,231	Valid
8	0,428	0,231	Valid
9	0,519	0,231	Valid
10	0,485	0,231	Valid
11	0,470	0,231	Valid
12	0,470	0,231	Valid
13	0,427	0,231	Valid
14	0,419	0,231	Valid
15	0,450	0,231	Valid
16	0,416	0,231	Valid
17	0,446	0,231	Valid
18	0,447	0,231	Valid
19	0,404	0,231	Valid
20	0,408	0,231	Valid
21	0,388	0,231	Valid
22	0,435	0,231	Valid
23	0,380	0,231	Valid
24	0,396	0,231	Valid
25	0,434	0,231	Valid
26	0,436	0,231	Valid

No	r-count	r-table	Valid / Invalid
27	0,333	0,231	Valid
28	0,342	0,231	Valid
29	0,359	0,231	Valid
30	0,324	0,231	Valid
31	0,388	0,231	Valid
32	0,374	0,231	Valid
33	0,423	0,231	Valid
34	0,386	0,231	Valid
35	0,366	0,231	Valid
36	0,382	0,231	Valid
37	0,362	0,231	Valid
38	0,376	0,231	Valid
39	0,365	0,231	Valid
40	0,359	0,231	Valid

Based on the table 4 above, all statement items were declared valid because they fulfilled the validity criterion of $r\text{-count} > r\text{-table}$. Therefore, all instrument items were considered appropriate to be distributed to the research sample and utilized in the study.

b. Reliability Test

Table 5. Reliability Test Results

Case Processing Summary			
		N	%
Cases	Valid	71	98.6
	Excluded ^a	1	1.4
	Total	72	100.0
<i>a. Listwise deletion based on all variables in the procedure.</i>			
Reliability Statistics			
Cronbach's Alpha		N of Items	
(.873)		40	

Based on the data presented table 5 above, the reliability test results indicated that the Cronbach's alpha coefficient reached 0.873. This value demonstrates that the Cronbach's alpha coefficient exceeded 0.60, indicating that the instrument possessed a high level of reliability.

2. Description of the Research Implementation

The research was conducted at MAN 3 Mataram. Each class was treated on different days, beginning from March 1, 2026, to March 4, 2026 (Monday–Thursday). The Baamboozle class was conducted on Tuesday, March 2, 2026, as the experimental group 1, which received treatment through the implementation of Baamboozle learning media in the form of game-based learning quizzes.

The concrete manipulative class was conducted on Wednesday as the experimental group 2, which received treatment through the use of concrete manipulative learning media in the form of real objects, specifically geographical maps related to the material presented in the posttest questions. Meanwhile, the control class was also conducted on Wednesday as group 3, which only received instruction through the conventional lecture method.

The respondents in this study were students of MAN 3 Mataram. The research involved four classes, namely Class X A consisting of 15 students, Class X B consisting of 15 students, Class XI IPA consisting of 23 students, and Class XI IPS consisting of 19 students, resulting in a total of 72 students. Each group consisted of 24 students.

The grouping was carried out based on different instructional treatments involving the use of learning media in the Sejarah Kebudayaan Islam (SKI) subject. The purpose of this grouping was to determine the comparative effectiveness of instructional media on students' learning outcomes.

The overall posttest scores of the Baamboozle group, concrete manipulative group, and control group are presented in the following table.

Table 6. Posttest Scores of the Baamboozle Class, Concrete Manipulative Class, and Control Class

Class		
Bamboozle	Concrete Manipulative	Control
87	57	32
87	52	37
92	55	40
77	67	37
90	62	42
92	52	35

87	62	47
97	62	45
80	65	50
95	65	45
87	67	47
97	50	47
92	57	50
92	65	50
97	60	45
97	70	47
90	62	47
85	67	50
90	65	50
87	70	47
85	50	45
80	65	50
85	55	47
90	67	45

The table 6 above presents the posttest scores obtained from the learning achievement test, in which the three classes participated in the research concerning the implementation of the respective instructional media under investigation, namely Baamboozle, concrete manipulative media, and the control class. Each group obtained learning outcome scores following the instructional treatment. Each class consisted of 24 students.

The implementation of the three groups is described as follows:

a. Baamboozle

The implementation of instructional media in this study was carried out through the application of Baamboozle media in the Sejarah Kebudayaan Islam (SKI) subject at MAN 3 Mataram. The learning process began with preliminary activities consisting of apperception and the provision of learning motivation to students. The teacher then briefly explained the learning material as an introduction before entering the core activities. During the main activity, students were divided into several small groups to enhance collaboration and social interaction. Subsequently, the teacher distributed Baamboozle

access codes to the students. The students then accessed the platform using their respective devices and participated in the educational game that had been prepared.

During the gameplay process, students answered questions alternately. Each correct answer earned points, thereby creating a healthy competitive atmosphere among the groups. The interactions occurring throughout the activity demonstrated that students became more active, enthusiastic, and cognitively as well as emotionally engaged in the learning process. In the closing stage, the teacher ended the game session and conducted a reflection activity with the students. Students were asked to share the results of their discussions and the learning experiences they had gained. The teacher subsequently reinforced the learning material and concluded the lesson.

Overall, the implementation of Baamboozle media in SKI learning was able to create an interactive, enjoyable, and student-centered learning environment. This condition contributed to increased student engagement during the instructional process, which ultimately influenced the improvement of students' learning outcomes.

b. Concrete Manipulative Media

The implementation of concrete manipulative media in Sejarah Kebudayaan Islam (SKI) learning was conducted by utilizing real or replica objects that could be directly observed by students. The media used included historical maps of Indonesia and images of Islamic historical heritage.

At the beginning of the lesson, the teacher explained the learning objectives and provided an introduction to the topic concerning Islamic heritage and traditions in Indonesia. Subsequently, students were divided into several small groups to facilitate interaction and collaboration.

The teacher then distributed concrete media in the form of historical maps and models of Islamic heritage objects to each group. Students were instructed to observe, identify, and discuss various Islamic historical relics presented in the media, such as the Great Mosque of Demak, the tombs of Wali Songo, and the centers of Islamic dissemination in Indonesia.

Throughout this process, students engaged in hands-on learning activities, such as marking locations on maps and observing the forms and characteristics of Islamic historical artifacts. Afterwards, students presented the results of their group discussions in front of

the class. The teacher acted as a facilitator by providing clarification, reinforcement of the material, and feedback on students' work.

At the final stage, the teacher and students collaboratively concluded the learning material. Assessment was conducted through observations of student activities, group discussion outcomes, and presentation performance.

The implementation demonstrated that concrete manipulative media were effective in helping students understand abstract concepts in a more tangible and meaningful manner. However, the limited variation of interaction and the absence of competitive elements resulted in lower student engagement compared to the implementation of digital-based learning media.

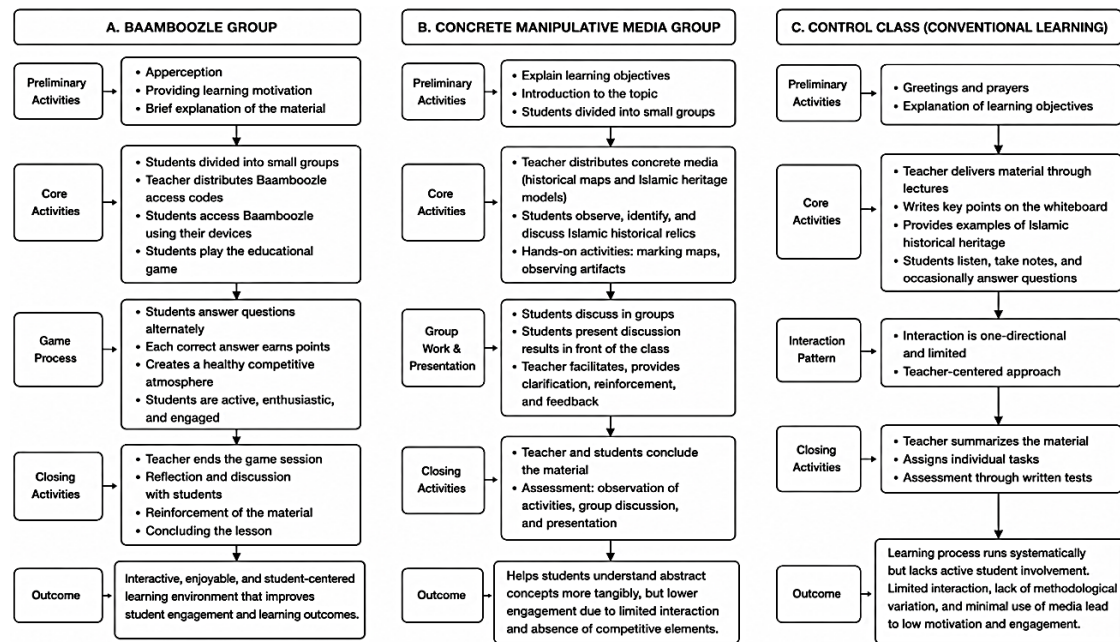
c. Control Class

The implementation of learning in the control class was conducted using a conventional teacher-centered approach. In this method, the teacher functioned as the primary source of information, while students acted mainly as recipients of the learning material. During the preliminary stage, the teacher opened the lesson with greetings, prayers, and an explanation of the learning objectives. Subsequently, the teacher delivered the material regarding Islamic heritage and traditions in Indonesia through the lecture method.

During the core activities, the teacher explained the material verbally, wrote important points on the whiteboard, and provided examples of Islamic historical heritage. Students listened to the teacher's explanation, took notes, and occasionally answered questions given by the teacher. The interaction occurring during the lesson tended to be one-directional and limited in nature.

At the closing stage, the teacher summarized the learning material and assigned individual tasks to the students. Assessment was conducted through written tests aimed at measuring students' understanding of the material that had been taught.

The implementation of this conventional learning approach demonstrated that the instructional process proceeded systematically; however, it lacked active student involvement. The limited interaction, lack of methodological variation, and minimal use of instructional media contributed to relatively low levels of student motivation and engagement during the learning process.



Note: This diagram illustrates the sequence of instructional implementation in the Baamboozle group, Concrete Manipulative Media group, and Control class.

Figure 1. Implementation Instructional Media in SKI Learning at MAN 3 Mataram

Figure 1 illustrates the implementation process of three instructional approaches used in SKI learning at MAN 3 Mataram, namely the Baamboozle group, the concrete manipulative media group, and the control class. The diagram shows that the Baamboozle group emphasized interactive digital game-based activities, collaborative learning, and competitive engagement, resulting in higher student participation and enthusiasm. In contrast, the concrete manipulative media group focused on hands-on learning through direct observation of historical objects and maps, which supported meaningful understanding but provided less interaction and competition. Meanwhile, the control class applied conventional lecture-based instruction characterized by one-directional communication and limited student involvement. Overall, the figure demonstrates that interactive and technology-based learning environments created more active and student-centered learning experiences compared to conventional teaching methods.

3. Prerequisite Tests for Data Analysis

a. Normality Test

In this study, the normality test was conducted using the Kolmogorov–Smirnov (K–S) technique. This technique is used to compare the distribution of sample data with the theoretical normal distribution and is commonly applied to studies involving more than 50 respondents. The total number of respondents in this study was 72 students. The

normality test was performed to determine whether the residual values were normally distributed. The results are presented as follows.

Table 7. Normality Test Results

Tests of Normality							
	Kelompok	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	Df	Sig.
skor	Bamboozle	.113	24	.200*	.945	24	.214
	Konkret manipulaf	.178	24	.047	.930	24	.098
	Kelas Kontrol	.148	24	.188	.958	24	.393
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

The table 7 shows that the significance value (Sig.) of the Shapiro–Wilk test for the Baamboozle class was 0.214, the concrete manipulative class was 0.098, and the control class was 0.393, all of which were greater than 0.05, it can be concluded that all data groups were normally distributed. Therefore, the data were considered appropriate for further statistical analysis.

b. Homogeneity Test

Table 8. Homogeneity Test Results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Skor	Based on Mean	.460	2	69	.633
	Based on Median	.274	2	69	.761
	Based on Median and with adjusted df	.274	2	68.776	.761
	Based on trimmed mean	.423	2	69	.657

Table 8 presents the results of the homogeneity of variance test using Levene's Test. The significance values obtained from all testing approaches, including based on the mean (Sig. = 0.633), median (Sig. = 0.761), adjusted median (Sig. = 0.761), and trimmed mean (Sig. = 0.657), were all greater than the significance level of 0.05. These findings indicate that the variances among the three groups were homogeneous or equal. Therefore, the assumption of homogeneity required for conducting One-Way ANOVA was fulfilled, meaning that the data were appropriate for further inferential statistical analysis.

This study employed Levene's Test for Equality of Variances, which is a standard and widely used technique for examining the homogeneity of variances among three or more groups. The decision criteria were as follows: if the p-value > 0.05, the variances were

considered homogeneous; conversely, if the $p\text{-value} \leq 0.05$, the variances were considered non-homogeneous. Based on the results of the homogeneity test, the significance value obtained was $0.633 \geq 0.05$. Therefore, it can be concluded that all groups had homogeneous variances.

c. Hypothesis Testing

The hypothesis testing in this study aimed to determine whether there were differences in students' learning outcomes in the Sejarah Kebudayaan Islam (SKI) subject among the three treatment groups, namely the Baamboozle media group, the concrete manipulative media group, and the control group. One-Way ANOVA was employed to examine whether significant differences existed between the learning outcomes of students who were taught using Baamboozle media and those who were taught using concrete manipulative media.

The decision criteria were as follows:

- 1) If the significance value ($p\text{-value}$) < 0.05 , it can be concluded that there is a statistically significant difference.
- 2) If the significance value ($p\text{-value}$) > 0.05 , it can be concluded that there is no statistically significant difference.

Table 9. One Way Anova Test

ANOVA					
skor					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28487.694	2	14243.847	402.536	.000
Within Groups	2441.583	69	35.385		
Total	30929.278	71			

Based on the results of the One-Way ANOVA test presented in Table 9, the significance value obtained was 0.000, which was lower than 0.05. Therefore, it can be concluded that there were statistically significant differences resulting from the use of the three instructional media across the respective groups, namely the Baamboozle class, the concrete manipulative media class, and the control class.

The test was conducted at a significance level of $\alpha = 0.05$. Since the obtained $p\text{-value}$ was $0.000 < 0.05$, the null hypothesis (H_0) was rejected, indicating that there were significant differences in the mean learning outcomes among the groups. Following the

significant ANOVA result ($p < 0.05$), a post hoc test using Tukey HSD was subsequently conducted to determine which group demonstrated higher mean learning outcomes.

4. Post Hoc Test

The Post Hoc test was conducted only when the results of the main ANOVA test indicated a statistically significant overall difference among the groups. If the ANOVA test results showed a significant difference ($p < 0.05$), the analysis was continued using the post hoc test (Tukey HSD) to identify which groups had higher mean learning outcomes. The explanation of the results is presented below.

Table 10. Post Hoc Test Results

Multiple comparisons							
Dependent Variable: skor							
	(I) kelompok	(J) kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Bamboozle	Konkret Manipulative	28.62500*	1.71720	.000	24.5118	32.7382
		Kelas Kontrol	48.45833*	1.71720	.000	44.3451	52.5716
	Konkret manipulatif	Bamboozle	-28.62500*	1.71720	.000	-32.7382	-24.5118
		Kelas Kontrol	19.83333*	1.71720	.000	15.7201	23.9466
	Kelas Kontrol	Bamboozle	-48.45833*	1.71720	.000	-52.5716	-44.3451
		Konkret Manipulative	-19.83333*	1.71720	.000	-23.9466	-15.7201

*. The mean difference is significant at the 0.05 level.

Table 10 presents the results of the Tukey HSD post hoc test, which was conducted to identify significant differences among the three instructional groups after the One-Way ANOVA analysis. The findings indicate that all group comparisons produced significance values of 0.000, which are lower than 0.05, demonstrating statistically significant differences in students' learning outcomes among the groups. The Baamboozle group showed the highest mean scores, with a positive mean difference of 28.625 compared to the concrete manipulative group and 48.458 compared to the control group. Meanwhile, the concrete manipulative group also achieved significantly higher scores than the control group, with a mean difference of 19.833. These results indicate that the Baamboozle learning media was the most effective instructional medium in improving

students' learning outcomes in the SKI subject compared to concrete manipulative media and conventional teaching methods.

The criteria for interpreting the follow-up test in One-Way ANOVA are as follows:

- a) If the significance value (p-value) < 0.05 , it can be concluded that there is a statistically significant difference.
- b) If the significance value (p-value) > 0.05 , it can be concluded that there is no statistically significant difference.

Based on the calculation results presented in the table above, it can be observed that the significance value (Sig.) for all group comparisons was 0.00, indicating that there were highly significant differences among the three experimental groups. Group 1 differed significantly from Groups 2 and 3, Group 2 differed significantly from Groups 1 and 3, and Group 3 differed significantly from Groups 1 and 2.

Furthermore, to determine which group was more effective or demonstrated higher performance, the interpretation was based on the criterion that a positive and significant value in the mean difference column indicates that the respective group achieved higher learning outcomes. Based on the post hoc test results using Tukey HSD, the Baamboozle group showed positive mean difference values, indicating that Baamboozle fulfilled the effectiveness criteria and achieved higher scores. Therefore, the use of Baamboozle learning media was considered more effective than concrete manipulative learning media and conventional instruction in improving students' learning outcomes.

DISCUSSION

1. Results Analysis

a. Media Learning That Was Most Effective in Improving Students' Learning Outcomes

The findings of this study demonstrate that Baamboozle-based learning media was the most effective instructional medium in improving students' learning outcomes in the Sejarah Kebudayaan Islam (SKI) subject at MAN 3 Mataram. This conclusion was supported by the results of the One-Way ANOVA test, which revealed a significance value of 0.000 ($p < 0.05$), indicating statistically significant differences among the three instructional groups. Furthermore, the Tukey HSD post hoc analysis confirmed that the

Baamboozle group achieved the highest mean learning outcomes compared to both the concrete manipulative group and the control group. The positive mean differences and consistently significant statistical results indicate that digital game-based learning provided stronger instructional effects on students' cognitive achievement.

The superiority of Baamboozle learning media can be interpreted through the characteristics of interactive digital learning environments that actively involve students during the instructional process. The implementation of Baamboozle created competitive, collaborative, and enjoyable classroom interactions through quizzes, immediate scoring systems, and group-based activities. These instructional conditions encouraged students to become more engaged cognitively and emotionally, resulting in higher participation and better comprehension of learning materials. The findings support the argument proposed by Wardani & Kiptiyah, (2024), who stated that game-based learning platforms such as Baamboozle significantly enhance student engagement and learning outcomes by creating interactive and enjoyable learning environments. Similarly, Khayyirah et al., (2024) emphasized that Baamboozle-assisted learning improves students' cognitive achievement because it promotes active participation, collaboration, and learning motivation during classroom activities.

From a theoretical perspective, the effectiveness of Baamboozle learning media can also be explained through Skinner's behaviorism theory, which emphasizes the importance of stimulus-response mechanisms and reinforcement in learning processes (Skinner, 1953). In the Baamboozle implementation, quizzes, rewards, scores, and competition functioned as positive reinforcement capable of stimulating students' responses and maintaining their motivation throughout the lesson. Students became more enthusiastic because every correct answer immediately generated rewards and recognition within the group competition. This condition strengthened learning behavior and contributed to improved academic achievement.

In addition, the findings are also consistent with Bandura's social learning theory, which explains that learning occurs through observation, interaction, and social engagement (Bandura, 1977). The collaborative activities embedded in Baamboozle learning encouraged students to exchange ideas, discuss answers, and observe peer performance during gameplay. Such interactions created socially meaningful learning experiences that enhanced students' understanding of SKI materials. Furthermore, Dale's

Cone of Experience theory supports the idea that participatory and active learning experiences are more memorable than passive verbal instruction (Dale, 1969). Baamboozle learning involved students directly in the instructional process, enabling them to actively construct understanding rather than merely receiving information from teachers.

The present findings are also aligned with several previous empirical studies. Rohmah and Puspasari, (2025) found that Baamboozle-assisted active learning significantly improved students' academic achievement. Likewise, Wulandari et al., (2025) reported that Baamboozle increased students' learning interest and achievement because it facilitated interactive and competitive instructional experiences. Similar findings were also reported by Mariani et al., (2022), who concluded that Baamboozle positively influenced students' learning outcomes and classroom engagement in hybrid learning settings. In Islamic education contexts, Anwar et al., (2025) further demonstrated that Baamboozle implementation in Fiqh learning significantly improved students' participation and academic performance. Therefore, the findings of this study strengthen previous evidence that digital game-based learning media are highly effective instructional tools for improving students' learning outcomes, particularly in Islamic education subjects.

The higher effectiveness of Baamboozle compared to conventional instruction also indicates that contemporary students tend to respond more positively to technology-integrated learning environments. Students in the digital era are generally more attracted to visual, interactive, and technology-based learning activities than traditional lecture-centered instruction. Consequently, the integration of digital learning media not only improves students' understanding of instructional materials but also addresses students' motivational and psychological learning needs in modern educational contexts.

b. Differences in Learning Outcomes among Baamboozle Media, Concrete Manipulative Media, and the Control Class

The findings of this study revealed statistically significant differences in students' learning outcomes among the Baamboozle group, the concrete manipulative media group, and the control group. The Tukey HSD post hoc analysis showed that the significance values for all group comparisons were 0.000 ($p < 0.05$), indicating meaningful differences among the instructional treatments. Specifically, the Baamboozle group achieved significantly higher learning outcomes than the concrete manipulative group, with a mean difference of 28.625. Moreover, the difference between the Baamboozle group and the

control group was even larger, with a mean difference of 48.458. Meanwhile, the concrete manipulative group also outperformed the control group, as indicated by a significant mean difference of 19.833.

These findings indicate that both innovative instructional media—Baamboozle and concrete manipulative media—were more effective than conventional lecture-based instruction in improving students' learning outcomes. However, Baamboozle demonstrated the strongest instructional effect among the three groups. The superiority of Baamboozle can be attributed to its digital interactivity, gamification elements, immediate feedback systems, and competitive learning atmosphere, which were absent in the concrete manipulative and conventional instructional approaches. Students participating in Baamboozle-based learning became more enthusiastic, motivated, and actively involved during classroom activities because the instructional process integrated competition, collaboration, and entertainment simultaneously.

The relatively lower performance of the concrete manipulative group compared to the Baamboozle group suggests that direct physical interaction alone was insufficient to maximize students' engagement in contemporary learning environments. Although concrete manipulative media helped students understand abstract concepts through direct observation and hands-on learning activities, the instructional process lacked dynamic interaction, immediate reinforcement, and competitive stimulation. Nevertheless, the concrete manipulative group still performed significantly better than the control group, indicating that contextual and experiential learning activities remain beneficial for students' conceptual understanding.

The findings support Piaget's constructivist theory, which emphasizes that students construct knowledge through direct interaction with learning objects and experiences (Piaget, 1970). In the concrete manipulative group, students learned through observing maps, identifying historical locations, and interacting with representations of Islamic heritage. Such activities enabled students to connect abstract historical concepts with tangible learning experiences. Similarly, Ausubel's meaningful learning theory explains that learning becomes more effective when new knowledge is connected to learners' existing cognitive structures and experiences (Ausubel, 1968). Both Baamboozle and concrete manipulative media facilitated meaningful learning experiences; however, Baamboozle

provided additional motivational and interactive dimensions that enhanced learning effectiveness more substantially.

The significantly lower performance of the control group demonstrates the limitations of teacher-centered lecture methods in modern educational settings. During conventional instruction, students tended to become passive recipients of information, with minimal interaction and limited opportunities for active participation. These conditions reduced students' attention, motivation, and engagement during learning activities. The findings are consistent with Fikroh & Ashoumi, (2025), who reported that learning outcomes in Islamic education subjects often remain low due to monotonous instructional methods and limited use of interactive learning media. Likewise, Albert, (2024) argued that digital interactive media significantly improve students' motivation, engagement, and understanding compared to conventional instructional approaches.

Overall, the findings indicate that instructional media play a substantial role in influencing students' learning outcomes in SKI learning. The comparison among the three groups demonstrates that instructional approaches integrating interactivity, collaboration, visualization, and student participation produce more effective learning experiences than conventional teacher-centered instruction. Therefore, the integration of innovative instructional media, particularly digital game-based learning platforms such as Baamboozle, can be considered an effective pedagogical strategy for improving students' academic achievement in Islamic education contexts.

2. Comparison with Previous Studies

The findings of this study are generally consistent with previous research demonstrating the effectiveness of digital game-based learning media in improving students' academic achievement, engagement, and classroom participation. The present study confirmed that Baamboozle learning media produced significantly higher learning outcomes compared to concrete manipulative media and conventional lecture-based instruction. This finding reinforces the argument that interactive digital learning environments positively influence students' cognitive performance because they encourage active participation, competition, collaboration, and immediate feedback during learning activities.

The results are in line with the study conducted by Rohmah and Puspasari, (2025), who found that the Active Learning Type Quiz Team model assisted by Baamboozle

significantly improved students' learning achievement. Similar findings were also reported by Wulandari et al., (2025), who concluded that Baamboozle increased students' learning interest and academic achievement because it facilitated enjoyable and competitive instructional experiences. In the present study, students participating in Baamboozle-based learning demonstrated higher enthusiasm, stronger classroom participation, and better posttest scores compared to students in the other groups. These similarities indicate that the effectiveness of Baamboozle is not limited to particular subjects but can be applied effectively across various educational contexts, including Islamic Cultural History (SKI).

Furthermore, the findings support the study by Mariani et al., (2022), which revealed that Baamboozle positively influenced students' learning achievement and classroom engagement in hybrid learning settings. The present research similarly found that students became more cognitively and emotionally involved during instructional activities when digital game-based learning was implemented. This condition supports the broader perspective proposed by Adipat et al., (2021), who argued that digital game-based learning represents an effective strategy for increasing student engagement and conceptual understanding in modern education. Therefore, the current study strengthens existing evidence that interactive digital learning media are highly relevant for twenty-first-century educational environments characterized by technology integration and student-centered learning approaches.

The findings are also consistent with research conducted in Islamic education contexts. Anwar et al., (2025) found that the implementation of Baamboozle in Fiqh learning significantly increased students' participation and learning achievement after several instructional cycles. Likewise, Albert, (2024) reported that digital interactive media in Islamic Religious Education improved students' motivation, classroom engagement, and conceptual understanding. The present study extends these findings specifically into the context of Sejarah Kebudayaan Islam (SKI), demonstrating that digital game-based learning media are also highly effective for improving historical and conceptual understanding in Islamic education subjects.

In addition, the current findings are supported by Walidaina et al., (2024), who concluded that Baamboozle significantly improved students' English vocabulary achievement compared to conventional instruction. Although the disciplinary context differed from the present study, both studies demonstrated similar instructional patterns,

namely that game-based digital learning environments facilitate active student involvement and strengthen academic achievement. This consistency suggests that the pedagogical effectiveness of Baamboozle lies not merely in the subject matter but in its interactive instructional design that stimulates students' motivation and participation.

The findings regarding concrete manipulative media also align with several previous studies emphasizing the importance of direct learning experiences in improving conceptual understanding. Sari & Ramadan, (2025) explained that concrete instructional media help students understand learning materials more effectively through real experiences and direct observation. Similarly, Sutrisno et al., (2019) stated that concrete manipulative media improve students' conceptual understanding and thinking skills because learners interact directly with learning objects during instructional activities. In the present study, the concrete manipulative group achieved significantly better learning outcomes than the control group, indicating that contextual and experiential learning approaches positively contributed to students' understanding of SKI materials.

Likewise, Laelasari, (2018) emphasized that concrete manipulative media help students understand abstract concepts through authentic learning experiences, making learning more meaningful and memorable. The findings of the present study support this perspective because students in the concrete manipulative group were able to observe maps, identify Islamic historical sites, and engage directly with representations of Islamic heritage. These activities helped students connect abstract historical concepts with tangible experiences. However, despite these advantages, the concrete manipulative group still produced lower learning outcomes than the Baamboozle group.

This difference represents an important contribution of the present study to the existing literature. Most previous studies examined the effectiveness of either digital learning media or concrete manipulative media separately, whereas the current study directly compared both instructional approaches within the same educational context. The results indicate that although concrete manipulative media remain pedagogically beneficial, digital game-based learning media provide stronger instructional impacts in contemporary classrooms due to their higher levels of interactivity, gamification, immediate feedback, and collaborative competition. Therefore, this study expands previous literature by demonstrating that digital interactive media may outperform conventional experiential

media in enhancing students' cognitive achievement, particularly among learners accustomed to technology-based learning environments.

The findings also support several foundational learning theories used in this study. Skinner's behaviorism theory explains that reinforcement mechanisms strengthen learning behavior through rewards and responses (Skinner, 1953). The scoring systems and competitive elements embedded in Baamboozle functioned as positive reinforcement that encouraged students' active participation. Meanwhile, Bandura's social learning theory is reflected in the collaborative and observational interactions occurring during group-based gameplay activities (Bandura, 1977). Students learned not only through direct instruction but also through peer interaction and group discussion.

Similarly, Piaget's constructivist theory and Ausubel's meaningful learning theory are evident in the implementation of concrete manipulative learning media, where students actively constructed understanding through direct interaction with learning objects and connected new knowledge with prior experiences (Piaget, 1970; Ausubel, 1968). However, the present study demonstrates that the integration of digital interactivity and gamification elements provided additional motivational advantages beyond direct physical interaction alone. Thus, the findings suggest that combining meaningful learning experiences with digital engagement strategies may produce more optimal instructional outcomes in modern educational settings.

Overall, the present study confirms, strengthens, and extends previous research concerning instructional media effectiveness. The findings consistently demonstrate that innovative instructional media significantly improve students' learning outcomes compared to conventional instruction. At the same time, this study contributes new empirical evidence showing that Baamboozle-based digital learning media are more effective than concrete manipulative media in improving students' learning outcomes in the SKI subject at the madrasah level.

3. Implications of Findings

The findings theoretically strengthen the literature on digital game-based learning by demonstrating that Baamboozle was more effective than concrete manipulative and conventional learning media in improving students' SKI learning outcomes. The results support behaviorism, social learning, and constructivist theories, particularly regarding the roles of reinforcement, interaction, collaboration, and meaningful learning experiences in

enhancing student achievement. Practically, the study suggests that teachers should integrate interactive digital media into Islamic education to create more engaging, student-centered, and motivating learning environments. The findings also highlight the importance of technological support, teacher training, and curriculum innovation to improve the quality of learning in madrasah education. Furthermore, the study indicates that digital pedagogy is highly applicable not only in science and language subjects but also in Islamic education contexts such as SKI learning.

4. Research Limitations

This study has several limitations. First, the sample was limited to 72 students from one madrasah, which may restrict the generalizability of the findings. Second, the quasi-experimental design did not fully control students' prior abilities, motivation, and learning experiences. Third, the study focused only on cognitive learning outcomes measured through posttest scores, without examining motivation, critical thinking, or long-term retention. In addition, the treatment duration was relatively short, and external variables such as digital literacy, classroom environment, and teacher competence were not fully controlled. Finally, the study only investigated SKI learning, so the findings may not directly apply to other subjects or educational contexts.

CONCLUSION

This study aimed to compare the effectiveness of Baamboozle learning media, concrete manipulative learning media, and conventional instruction on students' learning outcomes in the Sejarah Kebudayaan Islam (SKI) subject at MAN 3 Mataram. Based on the findings obtained through One-Way ANOVA and Tukey HSD post hoc analysis, it can be concluded that significant differences existed among the three instructional groups. The Baamboozle group demonstrated the highest learning outcomes, followed by the concrete manipulative group, while the control group achieved the lowest scores. The statistical results revealed that the significance value of the ANOVA test was 0.000 (< 0.05), indicating that the instructional media used significantly influenced students' learning achievement. Furthermore, the Tukey HSD analysis showed that the Baamboozle group outperformed both the concrete manipulative and control groups, with mean differences of 28.625 and 48.458 respectively. These findings indicate that Baamboozle-based game

learning media were the most effective instructional approach for improving students' learning outcomes in SKI learning.

The effectiveness of Baamboozle media can be attributed to its interactive and game-based characteristics, which encouraged active participation, collaboration, immediate feedback, and healthy competition among students. The implementation of digital game-based learning created a more engaging and student-centered learning environment compared to conventional lecture-based instruction. Meanwhile, concrete manipulative media also positively contributed to students' understanding by providing direct and contextual learning experiences through hands-on activities. However, the absence of digital interactivity and gamification elements caused the effectiveness of concrete manipulative media to remain lower than that of Baamboozle. In contrast, conventional instruction in the control class tended to produce lower student engagement and participation because the learning process was predominantly teacher-centered and lacked interactive learning experiences.

Despite these findings, this study has several limitations that should be acknowledged. First, the study involved a relatively limited sample consisting of 72 students from a single madrasah, which may limit the generalizability of the findings to broader educational contexts. Second, the research focused only on cognitive learning outcomes measured through posttest scores, without examining affective aspects such as learning motivation, critical thinking, or long-term retention. Third, the duration of the treatment implementation was relatively short, which may not fully capture the long-term effectiveness of the instructional media. Additionally, uncontrolled external variables such as students' prior technological familiarity, individual learning styles, and classroom environmental factors may have influenced the research outcomes.

Based on these limitations, future research is recommended to involve larger and more diverse samples across different educational institutions and regions in order to strengthen the generalizability of the findings. Further studies may also investigate the long-term effects of Baamboozle and other digital game-based learning media on students' motivation, critical thinking, collaboration skills, and affective learning outcomes. In addition, future researchers are encouraged to combine quantitative and qualitative approaches to obtain a more comprehensive understanding of students' learning experiences during the implementation of interactive instructional media. Finally,

comparative studies involving other innovative digital learning platforms and blended learning models in Islamic education contexts are strongly recommended to enrich the development of technology-integrated instructional strategies in madrasah education.

REFERENCES

- Adelia, I., Astuti, R. P. F., & Puspananda, D. R. (2025). Efektivitas Pembelajaran Game Based Learning Menggunakan Baamboozle terhadap Prestasi Belajar Ekonomi Siswa Kelas XI SMAN 1 Kalitidu. *Dharmas Education Journal (DE_Journal)*, 6(1), 187–194. https://doi.org/10.56667/de_journal.v6i1.1819
- Adipat, S., Laksana, K., Busayanon, K., Asawasowan, A., & Adipat, B. (2021). Engaging students in the learning process with game-based learning: The fundamental concepts. *International Journal of Technology in Education*, 4(3), 542–552. <https://doi.org/10.46328/ijte.169>
- Agustin, M., Puspita, R. D., Inten, D. N., & Setiyadi, R. (2021). Early detection and stimulation of multiple intelligences in kindergarten. *International Journal of Instruction*, 14(4), 873–890. <https://doi.org/10.29333/iji.2021.14450a>
- Albert, R. (2024). Penggunaan Media Digital dalam Pembelajaran PAI Materi Rukun-Rukun Sholat untuk Meningkatkan Motivasi Belajar Siswa Kelas 3 SD di SDIT Ruhul Jadid Bengkulu Utara. *AL-ASHR: Jurnal Pendidikan dan Pembelajaran Dasar*, 9(2), 107–118. <https://doi.org/10.56013/alashr.v9i2.3298>
- Anwar, H. S., Firmansah, D., Umami, H., & Ningrum, S. (2025). Pembelajaran Fiqh Interaktif dengan Media Bamboozle Siswa Kelas IV di MI Salafiyah Tanjungsari. *Tarbawi Ngabar: Jurnal of Education*, 6(1), 38–53. <https://doi.org/10.55380/tarbawi.v6i1.989>
- Arikunto, S. (2018). *Dasar-Dasar Evaluasi Pendidikan*. Bumi Aksara.
- Arsyad, A. (2019). *Media Pembelajaran*. Rajawali Pers.
- Ausubel, D. P. (1968). *Educational psychology: A cognitive view*. Holt, Rinehart and Winston.
- Bandura, A. (1977). *Social learning theory*. Prentice Hall.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Houghton Mifflin.
- Dale, E. (1969). *Audio-visual methods in teaching* (3rd ed.). Holt, Rinehart and Winston.
- Dwijayani, N. M. (2019). Development of circle learning media to improve student learning outcomes. *Journal of Physics: Conference Series*, 1321, 022099. <https://doi.org/10.1088/1742-6596/1321/2/022099>
- Emzir. (2016). *Metodologi Penelitian Pendidikan*. Rajawali Pers.
- Emzir. (2020). *Metodologi Penelitian Pendidikan: Kuantitatif dan Kualitatif*. Raja Grafindo Persada.
- Field, A. (2013). ANOVA and post hoc tests. In *Discovering statistics using IBM SPSS statistics*. SAGE Publications.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.
- Fikroh, F. M., & Ashoumi, H. (2025). Pengaruh Media Baamboozle terhadap Hasil Belajar SKI Materi Hijrah Nabi di MI Madinatul Ulum Tembelang Jombang. *MASALIQ: Jurnal Pendidikan dan Sains*, 5(3), 1020–1036. <https://doi.org/10.58578/masaliq.v5i3.5631>
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2015). *How to design and evaluate research in education* (9th ed.). McGraw-Hill Education.

- Ghozali, I. (2021). *Aplikasi Analisis Multivariate dengan Program IBM SPSS*. Badan Penerbit Universitas Diponegoro.
- Irawati, T. N., Mahmudah, M., & Purnamasari, O. (2025). Penerapan Model Problem Based Learning (PBL) Berbantuan Media Baamboozle Dapat Meningkatkan Hasil Belajar Siswa Materi Sistem Persamaan Linear Dua Variabel (SPLDV) Kelas VIII B MTs. Ma'arif Ambulu. *LAPLACE: Jurnal Pendidikan Matematika*, 8(1), 284–289. <https://doi.org/10.31537/laplace.v8i1.2412>
- Kajori, F. I., & Hendriana, B. (2023). Improving students' mathematical communication ability through problem-based learning assisted by Baamboozle. *Mathline: Jurnal Matematika dan Pendidikan Matematika*, 8(3), 893–904. <https://doi.org/10.31943/mathline.v8i3.467>
- Khayyirah, S., Islami, N., & Zulhelmi, Z. (2024). Effectiveness of the STAD-type cooperative learning model assisted by Baamboozle game to improve students' cognitive learning outcomes. *Journal of Educational Sciences*, 8(2), 294–301. <https://doi.org/10.31258/jes.8.2.p.294-301>
- Laelasari. (2018). Self regulated learning trough project base learning on the prospective math teacher. *Journal of Physics: Conference Series*, 983, 012156. <https://doi.org/10.1088/1742-6596/983/1/012156>
- Lestari, A. D., Pratiwi, R., & Nastion, S. J. (2022). Strategi Pembelajaran Contextual Teaching Learning pada Sejarah Kebudayaan Islam. *Journal of Educational Management and Strategy*, 1(1), 40–45. <https://doi.org/10.57255/jemast.v1i1.56>
- Mariani, S. D., Larasati, D. A., Prasetya, S. P., & Stiawan, A. (2022). Pengaruh Pembelajaran Hybrid Learning Menggunakan Media Baamboozle terhadap Hasil Belajar dan Minat Belajar Siswa SMP. *Dialektika Pendidikan IPS*, 2(2), 206–216. <https://doi.org/10.26740/penips.v2i2.48607>
- Piaget, J. (1970). *Science of education and the psychology of the child*. Orion Press.
- Riduwan, & Sunarto. (2017). *Pengantar Statistika untuk Penelitian Pendidikan, Sosial, Ekonomi, Komunikasi, dan Bisnis*. Alfabeta.
- Riwulang, N., Apsarini, I. N., Hilmasari, L. F., Sayyidaturrohman, Sholihah, U., & Setyowati, E. (2026). Pengaruh Media Baamboozle terhadap Hasil Belajar Siswa. *POLINOMIAL: Jurnal Pendidikan Matematika*, 5(1), 250–258. <https://doi.org/10.56916/jp.v5i1.3231>
- Rohmah, V. S., & Puspasari, D. (2025). Pengaruh Model Pembelajaran Active Learning Type Quiz Team Berbantuan Media Interaktif Baamboozle terhadap Hasil Belajar Siswa. *JHIP: Jurnal Ilmiah Ilmu Pendidikan*, 8(12), 13770–13775. <https://doi.org/10.54371/jhip.v8i12.10017>
- Rusman. (2017). *Model-Model Pembelajaran: Mengembangkan Profesionalisme Guru*. Rajawali Pers.
- Santoso, S. (2021). *Panduan Lengkap SPSS*. Elex Media Komputindo.
- Sari, N., & Ramadan, Z. H. (2025). Pengaruh Model Problem Based Learning (PBL) Berbantuan Media Baamboozle terhadap Hasil Belajar PKn Siswa Kelas IV Sekolah Dasar. *Cetta: Jurnal Ilmu Pendidikan*, 8(3), 447–456. <https://doi.org/10.37329/cetta.v8i3.4424>
- Setiawan, B., & Suwandi, E. (2022). The development of Indonesia national curriculum and its changes: The integrated science curriculum development in Indonesia. *Journal of Innovation in Educational and Cultural Research*, 3(4), 528–535. <https://doi.org/10.46843/jiecr.v3i4.211>
- Skinner, B. F. (1953). *Science and human behavior*. Macmillan.
- Sudjana, N. (2017). *Penilaian Hasil Proses Belajar Mengajar*. Remaja Rosdakarya.

- Sugiyono. (2022). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Wahyuningsih, E., Hidayati, F. H., Muflih, G. Z., & Fersellia. (2024). Problem-based learning with Baamboozle edugame: Enhancing critical thinking skills and learning interest. *Journal of Advanced Sciences and Mathematics Education*, 4(2), 113–124. <https://doi.org/10.58524/jasme.v4i2.477>
- Walidaina, F. A. J., Fadhilawati, D., & Sutanti, N. (2024). The effectiveness of Baamboozle to escalate seventh-grade students' vocabulary learning outcomes. *Jurnal Pendidikan: Riset dan Konseptual*, 8(4), 786–795. https://doi.org/10.28926/riset_konseptual.v8i4.1109
- Wardani, M. E., & Kiptiyah, S. M. (2024). Game-based learning model with Baamboozle media based on artificial intelligence increases student engagement and learning outcomes. *Jurnal Ilmiah Sekolah Dasar*, 8(2), 293–303. <https://doi.org/10.23887/jisd.v8i2.67141>
- Wulandari, N. T., Utomo, S. W., & Styaningrum, F. (2025). Baamboozle media effect of the student's interest and cooperative accounting learning outcomes. *ASSETS: Jurnal Akuntansi dan Pendidikan*, 14(3), 133–142. <https://doi.org/10.25273/jap.v14i3.23043>
- Yuniar, M., Hermawan, Y., & Nurdianti, R. R. S. (2023). Penerapan Model Pembelajaran ROAR (Read, Observe, Auditory, Review) Berbantuan Media Baamboozle dalam Meningkatkan Pemahaman Konsep Peserta Didik pada Mata Pelajaran Ekonomi Kelas XI. *Jurnal Sains Student Research*, 1(1), 536–548. <https://doi.org/10.61722/jssr.v1i1.193>