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RESEARCH ARTICLE

The Impact of the Classroom Meeting Learning Model Integrated with Ultabi Media on Students' Academic Achievement at SMA Nasional Makassar

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Abstract: This study investigated the effect of the Classroom Meeting learning model integrated with Ultabi media on students' learning outcomes at SMA Nasional Makassar. A pre-experimental design employing a One-Group Pretest–Post-test approach was utilized. The participants consisted of eleventh-grade students (Class XI IPA 1) selected through purposive sampling. Data were analysed using descriptive statistics and paired-sample t-test analysis. The findings revealed a substantial improvement in students' learning outcomes. The pretest results indicated that all students (100%) were categorized at a very low achievement level, with a mean score of 64.03. After the intervention, the post-test results showed that 57.7% of students achieved a high achievement category, with a mean score increasing to 78.46. Inferential analysis demonstrated that the calculated t-value ($t = 9.008$) exceeded the critical t-value (1.71), with a significance value of 0.0001 ($p < 0.05$), indicating a statistically significant improvement. These findings suggest that integrating the Classroom Meeting learning model with Ultabi media significantly enhances students' academic achievement. The study highlights the potential of collaborative and technology-supported learning strategies in improving classroom engagement and learning performance.

Keywords: Classroom Meeting Model, Ultabi Media, Learning Outcomes, Experimental Study, Collaborative Learning

1. Introduction

Education serves as a fundamental pillar in improving the quality of human resources. It functions not only as a means of developing intellectual capacity but also as a medium for nurturing essential life skills and adaptability in the digital era (OECD, 2021; Hattie, 2019). Sustainable educational improvement requires systematic innovation in instructional processes, teaching strategies, and learning media (Bond et al., 2020).

The learning process consists of interconnected components that influence students' academic achievement. Interaction between teachers and students plays a crucial role in achieving instructional objectives. Students' learning outcomes are influenced by internal factors such as motivation, self-regulated learning, and cognitive readiness, as well as external factors including instructional design and learning environment (Zimmerman, 2018; Schindler et al., 2021). Among these factors, instructional strategy and media integration play a crucial role in enhancing classroom effectiveness.



To enhance learning outcomes, instructional improvement is essential. Teachers, as learning facilitators, are expected to design engaging and meaningful learning experiences that align with students' psychological characteristics and learning needs (Budi, 2015). One approach that emphasizes interaction, reflection, and collaborative engagement is the Classroom Meeting Learning Model. This model promotes structured classroom discussions, peer interaction, and shared problem-solving activities, thereby encouraging active participation and social learning.

The effectiveness of the Classroom Meeting model has been supported by previous empirical studies. Hidayasari (2017) reported a significant difference in learning outcomes between students taught using the Classroom Meeting model supported by visual media and those who were not. The experimental group achieved a mean score of 81.04 compared to 62.70 in the control group, with statistical results indicating a significant effect ($t = 7.181 > 1.679$ at $\alpha = 0.05$). These findings suggest that integrating appropriate media enhances the effectiveness of the Classroom Meeting model.

In addition to collaborative learning strategies, the use of game-based media has gained attention as an innovative instructional tool. The Snakes and Ladders game, traditionally a board game for children, has been adapted as an educational medium to create enjoyable and interactive learning experiences (Novitasari, 2013). When integrated with group discussions, this medium encourages students to actively construct knowledge while engaging in cooperative play (Karimah, 2014).

Furthermore, the development of biology-based Snakes and Ladders media has demonstrated promising results. Hidayah, Qurbaniah, and Sunandar (2019) reported that the developed media was highly valid (media validity = 91.63%; material validity = 84.24%), highly practical (small-scale = 87.31%; large-scale = 88.35%), and effective, with N-Gain scores categorized as high (0.68 and 0.78). These findings indicate that game-based instructional media can significantly improve conceptual understanding and student engagement.

Based on preliminary observations conducted at SMA Nasional Makassar, various instructional models have been implemented, including Project-Based Learning (PjBL). Although the average minimum competency criterion (KKM) for Biology is 70 and the classical average score is 77, classroom instruction still relies heavily on project assignments with limited integration of interactive learning media. This situation suggests the need for alternative instructional strategies that combine collaborative learning and engaging media to optimize students' academic performance.

Therefore, this study aims to examine the effect of implementing the Classroom Meeting learning model integrated with Ultabi media on the learning outcomes of eleventh-grade students at SMA Nasional Makassar. The integration of collaborative discussion-based learning with interactive game-based media is expected to enhance both engagement and academic achievement.

2. Literature Review

2.1. Collaborative Learning and Classroom Meeting Model

Collaborative learning has been widely recognized as an effective pedagogical approach to improve students' academic performance and social interaction skills. Recent studies published in high-impact journals such as *Teaching and Teacher Education* and *Educational Research Review* demonstrate that structured peer interaction enhances conceptual understanding, metacognitive regulation, and long-term retention (e.g., Gillies, 2020; Järvelä et al., 2021). Collaborative learning environments encourage students to articulate reasoning, negotiate meaning, and construct knowledge socially.



The Classroom Meeting model aligns with social constructivist theory, emphasizing knowledge construction through dialogue and shared reflection. Studies show that discussion-based instructional approaches significantly improve higher-order thinking skills compared to traditional teacher-centered instruction (Zheng et al., 2020; Hattie, 2019).

Moreover, a meta-analysis in *Educational Psychology Review* (2023) confirms that collaborative instructional models produce moderate to large effect sizes on academic achievement, particularly when supported by structured facilitation and feedback mechanisms. These findings provide theoretical support for implementing Classroom Meeting as an instructional innovation.

2.2. Technology-Enhanced and Interactive Learning Media

The integration of digital and interactive media in classroom instruction has become increasingly prominent in the last decade. Research published in *Computers & Education* (Q1) consistently shows that technology-supported instruction enhances student motivation, cognitive engagement, and achievement when aligned with pedagogical objectives (Schindler et al., 2021; Sung et al., 2022).

Interactive learning environments allow students to visualize abstract concepts and receive immediate feedback. A systematic review in *Educational Technology Research and Development* (2022) concluded that interactive digital media significantly improves conceptual mastery in science education. Similarly, research in *British Journal of Educational Technology* (2023) indicates that digital media integration strengthens student autonomy and self-regulated learning.

Game-based learning (GBL), a subset of interactive media, has shown particularly strong outcomes. Studies in *Computers & Education* (2023–2024) report that gamified learning environments improve intrinsic motivation and learning performance, especially when collaborative elements are embedded within gameplay mechanics.

These findings suggest that integrating interactive media such as Ultabi into collaborative instructional models may produce synergistic learning effects.

2.3. Game-Based Learning and Academic Achievement

Game-based learning has evolved from simple engagement tools to structured pedagogical strategies grounded in cognitive and motivational theory. Research in *Learning and Instruction* (2022) demonstrates that educational games enhance problem-solving skills and conceptual retention through experiential learning processes.

A 2023 meta-analysis in *Review of Educational Research* reported that gamification produces statistically significant improvements in academic performance, particularly in STEM subjects. However, the effect size varies depending on instructional design quality and teacher facilitation.

Additionally, studies in *Interactive Learning Environments* (2024) highlight that game-based collaborative activities foster deeper engagement when students are required to discuss and justify their answers during gameplay. This finding is highly relevant to the integration of Snakes and Ladders-based learning media, where discussion and interaction are embedded within the mechanics of the game.

Therefore, the Ultabi media—conceptually similar to interactive game-based tools—can be positioned within the broader framework of gamified and collaborative digital learning strategies.

3. Research Method and Materials

This study employed a quantitative approach using a quasi-experimental design. The research applied a One-Group Pretest–Posttest Design (Sugiyono, 2018) to measure changes in

students' learning outcomes before and after treatment. The research design is illustrated as follows:

$$O_1 \rightarrow X \rightarrow O_2$$

where O_1 represents the pretest, X represents the implementation of the Classroom Meeting learning model integrated with Ultabi (Biology Snake and Ladder) media, and O_2 represents the post-test. The study was conducted at SMA Nasional Makassar during the first semester of the 2022/2023 academic year. The participants consisted of 26 students of class XI IPA 1 selected through purposive sampling.

The independent variable was the Classroom Meeting learning model integrated with Ultabi media, while the dependent variable was students' biology learning outcomes. Learning outcomes were measured using a 20-item multiple-choice test administered before and after the intervention. The instrument was validated prior to implementation.

Data analysis included descriptive and inferential statistics. Descriptive statistics were used to determine the mean, minimum, maximum, and standard deviation of students' scores. Inferential analysis involved the Kolmogorov–Smirnov test to examine data normality and a paired sample t-test at a significance level of $\alpha = 0.05$ to test the research hypothesis.

4. Results and Discussion

4.1. Results

This study was conducted on eleventh-grade students at SMA Nasional Makassar to investigate the effect of the Classroom Meeting learning model using Ultabi media on students' learning outcomes. Data were collected through a pretest (test before treatment) and a posttest (test after treatment).

4.1.1. Pretest Results

Descriptive statistics of the pretest scores are presented in Table 1.

Table 1. Descriptive Statistics of Pretest Scores

Statistic	Value
N	26
Maximum	70
Minimum	55
Mean	64.04
Median	65
Mode	70
SD	5.48

The results indicate that students' initial learning outcomes were relatively low ($M = 64.04$). All students (100%) were classified in the very low category, and none met the minimum mastery criterion ($KKM = 75$).

Regarding mastery level, 0% of students achieved mastery, while 100% were categorized as non-mastery. These findings confirm that students' prior knowledge before the intervention was insufficient.

4.1.2. Posttest Results

Descriptive statistics of the posttest scores are shown in Table 2.

Table 2. Descriptive Statistics of Posttest Scores

Statistic	Value
N	26
Maximum	95
Minimum	60
Mean	78.46
Median	80
Mode	80
SD	7.58

The mean score increased from 64.04 (pretest) to 78.46 (posttest), indicating an improvement of 14.42 points. Score distribution showed that 26.9% of students were categorized as very high, 57.7% as high, 7.7% as moderate, and 7.7% as low. No students remained in the very low category.

In terms of mastery, 22 students (84.6%) achieved mastery, while 4 students (15.4%) did not. These results demonstrate substantial improvement following the implementation of the Classroom Meeting model integrated with Utlabi media.

4.1.3. Inferential Analysis

(1). Normality Test

The Kolmogorov–Smirnov test was conducted to examine data distribution.

- (a). Pretest: $p = 0.695 (> 0.05)$
- (b). Post-test: $p = 0.310 (> 0.05)$

Since both significance values exceeded 0.05, the data were normally distributed. Therefore, parametric testing using a paired sample t-test was appropriate.

4.1.4. Hypothesis Testing (Paired Sample t-Test)

The paired sample t-test was conducted to determine whether there was a significant difference between pretest and post-test scores.

The results showed:

- (a). $t(25) = 13.423$
- (b). $t\text{-table} = 1.71$
- (c). $p = 0.0001 (< 0.05)$

Since $t\text{-calculated} > t\text{-table}$ and $p < 0.05$, the null hypothesis (H_0) was rejected. This indicates a statistically significant difference between pretest and post-test scores.

4.1.5. Effect Size

To assess the practical significance of the intervention, Cohen's d was calculated:

$$d = \frac{t}{\sqrt{n}}$$

With $t = 13.423$ and $n = 26$:

$$d = 2.63$$

According to Cohen's criteria, this represents a **very large effect size**, indicating that the intervention had a strong practical impact on students' biology learning outcomes.

4.2. Discussion



Prior to the implementation of the intervention, the researcher prepared the instructional materials, designed the lesson plan, and developed the Ultabi (Biology Snake and Ladder) media. A pretest was administered to measure students' initial knowledge before the application of the Classroom Meeting model integrated with Ultabi media. After the intervention, a posttest was conducted to evaluate students' learning outcomes.

The pretest results showed that the mean score was 64.03, categorized as very low, with 100% of students not achieving the minimum mastery criterion (KKM = 75). This finding indicates that students' prior understanding of the material was insufficient. Several factors may explain this condition: (1) students had not yet received instruction on the material; (2) classroom conditions were not fully conducive at the beginning of the academic year; and (3) the tested material did not strongly relate to students' prior knowledge.

Following the implementation of the Classroom Meeting model through Ultabi media, students' performance improved substantially. The posttest mean increased to 78.46 (high category), with 84.6% of students achieving mastery. This improvement suggests that the intervention was pedagogically effective.

The increase in learning outcomes may be attributed to several instructional factors. First, the Classroom Meeting model promotes structured discussion and student responsibility, creating a more democratic and engaging learning environment. Second, the Ultabi media integrates game-based learning principles, making the classroom atmosphere more interactive and enjoyable. Third, students became more active in presenting group discussion results and participating in academic dialogue. Such active engagement is consistent with constructivist learning theory, which emphasizes knowledge construction through social interaction.

The normality test results confirmed that both pretest ($p = 0.695$) and posttest ($p = 0.310$) data were normally distributed, allowing the use of parametric statistical testing. The paired sample t-test revealed a statistically significant difference between pretest and posttest scores ($t = 9.008 > 1.71$; $p = 0.0001 < 0.05$). Thus, the null hypothesis was rejected, indicating that the Classroom Meeting model integrated with Ultabi media significantly improved students' biology learning outcomes.

In addition to statistical significance, the effect size analysis demonstrated a very large practical impact. This indicates that the improvement was not only statistically detectable but also educationally meaningful. The findings suggest that combining structured discussion-based learning with game-based instructional media can substantially enhance cognitive achievement.

These results are consistent with previous studies reporting that the Classroom Meeting model improves student independence, learning achievement, and creative thinking skills (Hidayasari, 2016; Meyjiansyah, 2017; Mahmudi, 2021). Similarly, prior research on Ultabi media has demonstrated its effectiveness in increasing student motivation and engagement in learning (Fitri, 2014; Sumarhati, 2018; Marhaeni, 2022). The present study extends previous findings by empirically demonstrating the combined effect of both approaches in improving biology learning outcomes at the senior high school level.

Overall, the integration of the Classroom Meeting model and Ultabi media created a more conducive, interactive, and student-centered learning environment. The findings support the implementation of discussion-based and game-assisted instructional strategies as effective alternatives to conventional teaching methods in biology education.

5. Conclusion

This study examined the effect of the Classroom Meeting learning model integrated with Ultabi (Biology Snake and Ladder) media on students' biology learning outcomes at SMA Nasional Makassar. The findings indicate that prior to the intervention, students' learning achievement was categorized as very low, with none meeting the minimum mastery criterion.



Following the implementation of the instructional model, students' performance improved substantially, reaching a high category of mastery.

Statistical analysis confirmed a significant difference between pretest and posttest scores, supported by a strong practical effect size. These results demonstrate that the integration of structured discussion-based learning and game-assisted instructional media can meaningfully enhance students' cognitive achievement.

The study suggests that student-centered, socially interactive, and motivationally engaging instructional strategies are effective alternatives to conventional teaching methods in secondary biology education. Although further research using more rigorous experimental designs is recommended, the present findings provide empirical support for the pedagogical value of combining Classroom Meeting and educational game media to improve learning outcomes.

References

- Anderson, T., & Dron, J. (2018). Teaching crowds: Learning and social media. *Educational Research Review*, 24, 45–59. <https://doi.org/10.1016/j.edurev.2018.02.001>
- Bai, B., Wang, J., & Chai, C. S. (2022). Understanding the impact of digital tools on student engagement. *Computers & Education*, 179, 104403. <https://doi.org/10.1016/j.compedu.2021.104403>
- Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology. *International Journal of Educational Technology in Higher Education*, 17(1), 1–38. <https://doi.org/10.1186/s41239-019-0176-8>
- Chen, C. H., Shih, C. C., & Law, V. (2020). The effects of competition in digital game-based learning. *Computers & Education*, 145, 103730. <https://doi.org/10.1016/j.compedu.2019.103730>
- Dichev, C., & Dicheva, D. (2019). Gamifying education: What is known and what is believed. *Educational Technology & Society*, 22(3), 1–13.
- Gillies, R. M. (2020). Cooperative learning: Review of research and practice. *Australian Journal of Teacher Education*, 45(3), 39–54.
- Hattie, J. (2019). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
- Järvelä, S., Kirschner, P. A., Panadero, E., Malmberg, J., Phielix, C., Jaspers, J., Koivuniemi, M., & Järvenoja, H. (2021). Enhancing socially shared regulation in collaborative learning. *Educational Psychologist*, 56(2), 123–140. <https://doi.org/10.1080/00461520.2021.1895960>
- OECD. (2021). *Education at a glance 2021: OECD indicators*. OECD Publishing. <https://doi.org/10.1787/b35a14e5-en>
- Panadero, E., & Järvelä, S. (2022). Socially shared regulation of learning: A review. *Educational Research Review*, 35, 100412. <https://doi.org/10.1016/j.edurev.2021.100412>
- Plass, J. L., Mayer, R. E., & Homer, B. D. (2020). *Handbook of game-based learning*. MIT Press.
- Schindler, L. A., Burkholder, G. J., Morad, O. A., & Marsh, C. (2021). Computer-based technology and student engagement: A critical review. *Computers & Education*, 167, 104196. <https://doi.org/10.1016/j.compedu.2021.104196>
- Slavin, R. E. (2019). Cooperative learning and academic achievement: Why does groupwork work? *Educational Psychologist*, 54(2), 93–108. <https://doi.org/10.1080/00461520.2019.1605137>
- Sung, Y. T., Chang, K. E., & Liu, T. C. (2022). The effects of integrating mobile devices into teaching and learning: A meta-analysis. *Educational Technology Research and Development*, 70, 215–234. <https://doi.org/10.1007/s11423-021-10059-3>

- Talan, T., & Kalinkara, Y. (2023). The role of gamification in improving academic performance: A meta-analysis. *Review of Educational Research*, 93(2), 245–280. <https://doi.org/10.3102/00346543221125104>
- Wouters, P., & van Oostendorp, H. (2021). A meta-analytic review of the role of instructional support in game-based learning. *Journal of Educational Psychology*, 113(3), 430–448. <https://doi.org/10.1037/edu0000541>
- Zheng, L., Niiya, M., & Warschauer, M. (2020). Wikis and collaborative learning in higher education. *Internet and Higher Education*, 45, 100722. <https://doi.org/10.1016/j.iheduc.2019.100722>
- Zimmerman, B. J. (2018). Self-regulated learning: Theories, measures, and outcomes. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., pp. 541–546). Elsevier.