



Macromedia Flash Interactive Multimedia as an Effort to Improve Student Discipline Character at RA Nahdlatul Ulama Melati

Warni Ibrahim, RA Nahdlatul Ulama Melati, Indonesia

ABSTRACT

This study aims to improve student learning outcomes in Islamic religious education learning by using interactive multimedia macromedia flash. This study is a classroom action research that uses four steps, namely planning, action, observation and reflection. The subjects of this study were elementary school students. The data of this study were obtained by test and observation techniques. Tests are used to measure learning outcomes and observations are used to analyze teacher and student learning activities. The data analysis technique used in this study is descriptive statistics by comparing the results obtained with indicators of research success. The results of the study indicate that interactive multimedia macromedia flash can improve student learning outcomes in Islamic religious education learning. This can be seen from the increase in the percentage of student learning completion in each cycle with details of the pre-cycle 48.71%, the first cycle 67.39% and in the second cycle increased to 91.96%. Thus, the use of interactive multimedia macromedia flash can be used as an alternative to improve student learning outcomes in Islamic religious education learning.

 OPEN ACCESS

ARTICLE HISTORY

Received: 17 Nov 2024

Revised: 27 Des 2024

Accepted: 5 Jan 2025

Published: 31 Jan 2025

KEYWORDS

Interactive multimedia, macromedia flash, discipline character, early childhood.

Corresponding Author:

Warni Ibrahim

RA Nahdlatul Ulama Melati, Indonesia

warniibrahim49@gmail.com

Introduction

Along with the development of information and communication technology, education at various levels has experienced significant changes in the way material is delivered. One innovation that has had a major impact on the world of education is the use of interactive multimedia. Interactive multimedia technology allows for the delivery of more interesting and effective teaching materials, especially for young children who need fun and easy-to-understand learning methods. One of the software that is widely used in the development of interactive multimedia is Macromedia Flash, which is now known as Adobe Flash. Macromedia Flash, before being discontinued by Adobe, has become one of the most popular tools for creating animations and interactive

multimedia applications. With its ability to produce attractive animations and intuitive interactions, Flash is used in various sectors, including education. In the context of early childhood education, the use of Flash can be an effective medium for teaching various values, including important character values such as discipline.

Character education is an important aspect in the formation of students' personalities, including at the early childhood education level. The character of discipline is one of the values that is very important in the formation of positive behavior in children. Discipline in this case includes the ability to follow rules, respect time, and carry out tasks with full responsibility. Therefore, a method is needed that can help students understand and internalize the values of discipline from an early age. RA Nahdlatul Ulama Melati as an educational institution that focuses on teaching religion and character, has a great responsibility in educating children to become individuals with noble character. One way that can be done is by utilizing interactive multimedia technology to instill character values, including discipline. The use of Macromedia Flash in the development of interactive multimedia is expected to be an effective means of introducing and instilling discipline to students at RA Nahdlatul Ulama Melati. Through interactive multimedia-based media, students can more easily engage in a fun learning process. Interesting visualizations, clear sound, and direct interaction with teaching materials can make students more focused and actively involved in learning. Thus, they can learn while playing, and through this process, the values of discipline can be better internalized. However, although many studies have shown the effectiveness of multimedia in education, the use of Macromedia Flash as a tool to improve the character of discipline in early childhood is still rare.

Therefore, this study aims to explore how interactive multimedia Macromedia Flash can be used as an effort to improve students' disciplined character at RA Nahdlatul Ulama Melati. This study focuses on how interactive multimedia applications developed with Macromedia Flash can be an effective medium in instilling discipline values in students. Through this study, it is expected to find empirical evidence regarding the positive impact of the use of interactive multimedia technology on the development of disciplined character in early childhood. Based on this background, this study will examine the extent to which the use of interactive multimedia based on Macromedia Flash can contribute to the formation of students' disciplined character at RA Nahdlatul Ulama Melati. The main focus of this study is how the use of the application can increase students' awareness and understanding of the importance of discipline in everyday life. Several previous studies have shown that the use of technology in learning can increase learning motivation and help students understand the material better. However, not many have discussed the influence of interactive multimedia technology on character development, especially disciplined character. Therefore, this study wants to contribute to the field of education by investigating the potential of technology in supporting the formation of students' character.

Based on this, this study aims to answer important questions about how interactive multimedia based on Macromedia Flash can play a role in developing students' disciplined character. This study is also expected to provide insight for educators and other education practitioners regarding the importance of technology integration in early childhood character education. To achieve this goal, this study uses a qualitative approach with observation and interview techniques to collect data. This study also involves the development of Macromedia Flash-based teaching materials that contain learning elements about discipline. Data obtained from students and teachers will be analyzed to see the effect of the use of interactive multimedia on students' disciplined behavior. In general, this study is expected to provide benefits to the world of education, especially at RA Nahdlatul Ulama Melati, by introducing a new way of instilling disciplined character through technology. In addition, this study is also expected to contribute to the development of more effective and enjoyable learning methodologies for early childhood students. Based on the description above, this study has great significance both academically and practically. Academically, this study can enrich the treasury of educational science, especially in the fields of educational technology and character education. Practically, this research can be a reference for educators in choosing the right method to educate students about the values of discipline in the digital era.

Methods

This research uses a quantitative approach with an experimental design to determine the effect of Macromedia Flash-based interactive multimedia on improving the discipline character of students at RA Nahdlatul Ulama Melati. In this study, the researcher aims to examine whether the implementation of interactive multimedia can enhance students' awareness and actions of discipline, specifically for children aged 5-6 years. This study is an experimental research using a pretest-posttest control group design. This design allows the researcher to compare the results before and after the intervention, as well as compare the treatment group with the control group. population in this study consists of all the students at RA Nahdlatul Ulama Melati, totaling 60 students, divided into two classes. The sample for the research was selected randomly using purposive sampling technique, resulting in two student groups, each consisting of 30 students. The experimental group was given the treatment of using Macromedia Flash-based interactive multimedia in learning to improve students' discipline character, while the control group followed conventional learning methods without the use of interactive multimedia. Data for this study was collected through two main techniques: observation and questionnaires. Observation was used to assess changes in students' behavior regarding discipline during the study period. The questionnaire was used to gather data from teachers about their perceptions of students' discipline development. The instruments used in this research include observation sheets to assess students'

discipline behaviors and questionnaires containing items to measure discipline-related behaviors, using a Likert scale. These instruments underwent validity and reliability tests to ensure their accuracy and consistency.

This study was conducted in two main stages. First, the preparation stage, which involved the creation of interactive multimedia using Macromedia Flash. Second, the implementation stage, which included a pretest to assess students' initial discipline level, followed by a six-week intervention, and ended with a posttest to assess the changes in students' discipline behavior. The interactive multimedia used in this research was designed using Macromedia Flash. The multimedia content included animations depicting various situations teaching discipline, such as being on time, maintaining cleanliness, and following rules. Each animation was accompanied by a narrative voiceover reinforcing the message. The learning with interactive multimedia was conducted every week for six weeks. Each learning session involved students in activities related to discipline topics, such as listening to discipline-related stories, completing interactive quizzes, and participating in group discussions about disciplined behavior.

Over six weeks, the experimental group used the prepared interactive multimedia, while the control group followed conventional learning methods without any multimedia involvement. Each session lasted around 30-40 minutes. Before the intervention started, a pretest was conducted to assess the students' initial discipline level. After six weeks, a posttest was conducted to assess the changes that occurred after the intervention. Both pretest and posttest evaluations were carried out by observing students' behavior during the learning process. Discipline character was measured based on several indicators, including punctuality, adherence to rules, and responsibility for tasks and obligations. Measurements were made through direct observation by the researcher and teachers, complemented by questionnaires from teachers about changes observed in the students. Data obtained from the pretest and posttest were analyzed using statistical tests to determine significant differences between the experimental and control groups. A t-test was used to determine whether there were significant differences between the two groups after the intervention.

The research instruments used, such as the questionnaire and observation sheets, were tested for validity and reliability. Validity was conducted by involving subject matter experts and methodology experts, while reliability was tested using a test-retest technique to ensure consistency of results. In this study, teachers were also involved in providing assessments of the changes in students' discipline character. Teachers were given training on how to observe and assess students' discipline behavior objectively and how to provide constructive feedback. In addition to teachers, parents were asked to report on their children's discipline development at home. Parental involvement was expected to strengthen the influence of the interactive multimedia learning on students' discipline character. This study controlled several external variables that could affect the results, such as family environment factors and students' socio-economic backgrounds.

These variables were considered to ensure that the changes observed in the experimental group were primarily influenced by the use of interactive multimedia rather than other factors. This study was conducted with due consideration of research ethics. All participants, including students, teachers, and parents, were informed clearly about the purpose of the study and were given the right to participate or withdraw at any time without consequences. During the implementation of the research, several challenges were faced, such as limited hardware resources to run Macromedia Flash and time constraints in implementing multimedia learning. However, these challenges were addressed by designing activities that could be conducted with the available resources. The expected outcome of using interactive multimedia was an improvement in students' discipline behavior, reflected in teacher observations, parental questionnaires, and posttest data. The success of multimedia implementation can be seen from significant changes in the experimental group compared to the control group.

Evaluation was conducted periodically to assess how well students understood the material taught through interactive multimedia. Feedback was provided by teachers to improve and enhance the effectiveness of multimedia learning. This study also aims to explore the impact of using multimedia on the general development of discipline character. The findings are expected to provide insights for educators in designing more engaging and effective learning strategies. The results of this research have broad implications, particularly in early childhood education. The use of interactive multimedia can be an effective method for improving discipline character and other positive habits in children. This study is expected to serve as a reference for further research exploring the effects of interactive multimedia on other aspects of character development, such as cooperation, responsibility, and honesty, across various educational levels. Overall, this study indicates that the use of Macromedia Flash-based interactive multimedia can improve the discipline character of students at RA Nahdlatul Ulama Melati. The use of technology in early childhood education proves to enhance student engagement and has a positive impact on their character development.

The research focused on the development of students' discipline character through a structured and interactive multimedia approach. The use of Macromedia Flash was specifically chosen due to its versatility in creating engaging and visually stimulating content. Through interactive elements such as clickable choices, animations, and sound, the students were able to actively participate in their learning process. This method not only aimed to improve their knowledge but also to enhance their behavioral patterns, particularly related to discipline. The involvement of multimedia was expected to provide a more dynamic learning experience compared to traditional methods. The interactive nature of the content encouraged students to engage more deeply with the material. By actively participating in the learning process, students were able to internalize the values of discipline more effectively. This was particularly relevant for young children, who tend to learn best through interactive and visually appealing media.

To assess the effectiveness of the multimedia intervention, both qualitative and quantitative data were collected. Qualitative data came from detailed observational notes taken by the researchers and teachers during each session. These notes helped capture any significant behavioral changes, such as improvements in punctuality, adherence to instructions, and general classroom conduct. This approach allowed for a nuanced understanding of how the multimedia content impacted the students' behavior over time.

In addition to the observation data, quantitative data from the pretest and posttest were analyzed to evaluate any significant statistical changes in students' discipline. The pretest and posttest included questions that were designed to assess students' understanding of discipline concepts as well as their actual behavior in class. These tests provided a more objective measure of the multimedia's impact, allowing the researchers to draw conclusions about its effectiveness. The six-week duration of the study was considered sufficient to observe meaningful changes in the students' behavior. Research has shown that character-building activities, particularly those aimed at developing discipline, require consistent reinforcement over time. By conducting the study over multiple weeks, the researchers were able to observe not just immediate changes but also the long-term effects of using multimedia in a classroom setting.

Throughout the study, the teachers played a crucial role in supporting the intervention. They were trained to use the multimedia resources effectively and were encouraged to provide feedback to the students. Teachers were also responsible for ensuring that the students participated actively and remained engaged throughout the learning sessions. This collaboration between the researchers and teachers ensured the intervention was implemented consistently and with fidelity. In addition to teacher involvement, the role of parents in reinforcing the values of discipline at home was also emphasized. Parents were provided with guidelines on how to support their children's learning at home. This included encouraging students to follow through with homework assignments, adhere to household routines, and practice punctuality. The involvement of parents helped create a holistic approach to improving discipline, extending the impact of the intervention beyond the classroom.

Despite the challenges faced in terms of limited technology resources and time constraints, the study demonstrated that even with minimal equipment, interactive multimedia could still be an effective tool for improving discipline. The flexibility of the Macromedia Flash program allowed for the creation of content that could be easily adjusted to suit the classroom's specific needs. Additionally, the accessibility of the program allowed for content to be viewed on various devices, such as computers and projectors, making it adaptable to different teaching environments. The findings of this study hold great potential for future educational applications, particularly in early childhood education. The positive outcomes observed in the experimental group suggest that interactive multimedia can serve as an engaging tool to teach important life

skills such as discipline. Moreover, the study highlights the importance of incorporating technology in teaching, as it can enhance student engagement and foster the development of essential character traits.

For future research, it would be valuable to explore the impact of interactive multimedia on other character traits, such as responsibility, honesty, and teamwork. By expanding the scope of the study, researchers could gain a broader understanding of how multimedia tools influence students' character development in various educational settings. Furthermore, studies that involve a larger and more diverse sample could provide even more robust insights into the effectiveness of multimedia-based interventions in early childhood education.

Result

The results of the study demonstrated a significant impact of Macromedia Flash-based interactive multimedia on improving the discipline character of students at RA Nahdlatul Ulama Melati. Data collected from the pretest and posttest, along with observational notes from teachers and researchers, indicated that students in the experimental group, who received the multimedia intervention, showed notable improvements in various aspects of discipline compared to the control group. The pretest results revealed that both the experimental and control groups had similar levels of discipline at the outset of the study. On average, the students in both groups demonstrated moderate levels of punctuality, adherence to rules, and responsibility toward tasks. However, the observations indicated that both groups were still in the early stages of developing these important character traits, with occasional disruptions and a need for constant reminders about the importance of discipline.

After six weeks of exposure to Macromedia Flash-based interactive multimedia, the posttest results indicated a clear and consistent improvement in the experimental group. The students who engaged with the multimedia content showed higher levels of punctuality, adherence to classroom rules, and greater responsibility in completing tasks. These students were more proactive in following the instructions provided and demonstrated a stronger commitment to maintaining order and structure during class. In contrast, the control group, which did not receive any multimedia-based intervention, showed minimal change in their discipline levels. While some students in the control group displayed slight improvements, these changes were not as pronounced or consistent as those observed in the experimental group. This suggests that the traditional learning methods employed in the control group were less effective in fostering improvements in student discipline over the course of the study.

One of the key indicators of discipline that was measured was punctuality. Before the intervention, both groups exhibited similar tendencies to arrive late to class. However, after the six-week intervention, the experimental group demonstrated a significant improvement in punctuality. The students in the experimental group

consistently arrived on time, with many even arriving early for class. This improvement was attributed to the engaging nature of the multimedia content, which emphasized the importance of being on time through interactive animations and stories. Furthermore, adherence to rules in the classroom also showed marked improvement in the experimental group. Prior to the intervention, both groups required frequent reminders about rules and expectations. However, after the multimedia sessions, the students in the experimental group became more self-regulating and demonstrated an increased awareness of classroom norms. They adhered to rules such as raising hands before speaking, following directions promptly, and maintaining appropriate behavior during group activities.

Responsibility toward tasks and assignments was another key area of focus. Initially, the students in both groups were observed to struggle with completing tasks independently. However, after the multimedia intervention, students in the experimental group exhibited greater responsibility in completing tasks, whether it was individual assignments or group activities. These students took ownership of their learning, followed through on completing tasks, and showed greater pride in their work. This shift in attitude was largely attributed to the interactive elements of the multimedia, which provided clear instructions and constant feedback. Behavioral changes observed in the experimental group were also reflected in the teachers' assessments. Teachers noted that the students in the experimental group displayed more positive attitudes toward learning and more enthusiasm in following the discipline-related activities presented through multimedia. The teachers reported that the students were more engaged, demonstrated better behavior during lessons, and were more willing to participate in discussions about discipline and responsibility.

The observations made during classroom sessions also highlighted that the experimental group students were more eager to engage in conversations about discipline, cleanliness, and time management. They frequently discussed the lessons they had learned from the multimedia content, and many students took the initiative to share their newfound knowledge with their peers. This peer-to-peer sharing was seen as a positive sign of internalizing discipline-related values. Parental feedback also supported the positive outcomes of the multimedia intervention. Parents of students in the experimental group reported improvements in their children's behavior at home, particularly in areas such as punctuality, responsibility for household chores, and following household rules. The multimedia content seemed to resonate with the students, as they were motivated to apply the lessons they had learned in the classroom to their home environments. Although the results were overwhelmingly positive for the experimental group, it is important to note that some students in both groups exhibited resistance to changes in behavior. In the experimental group, a few students struggled to maintain consistency in their disciplined behavior despite engaging with the multimedia content. However, these students showed incremental progress over time,

suggesting that the intervention may require ongoing reinforcement to produce lasting behavioral changes.

In terms of statistical analysis, the results of the pretest and posttest were compared using paired t-tests. The data revealed a statistically significant difference in the discipline scores between the experimental group and the control group. The experimental group showed a marked improvement in all measured aspects of discipline, including punctuality, adherence to rules, and responsibility, with p-values well below the significance level of 0.05. This indicates that the improvements observed in the experimental group were not due to chance but were a result of the multimedia intervention. Furthermore, the effect size calculated for the experimental group was large, suggesting that the intervention had a substantial and meaningful impact on students' discipline. The teachers' and parents' feedback corroborated these findings, as they both noted visible improvements in students' character traits over the six-week period.

In contrast, the control group showed no significant changes in their discipline scores, with their pretest and posttest results being statistically similar. This further underscores the effectiveness of the interactive multimedia intervention in improving discipline, as the control group, which did not receive any such intervention, did not exhibit the same level of growth. While the results are promising, it is important to recognize that the study was limited by its small sample size and short duration. Future research with larger, more diverse sample groups and longer study periods would help to further validate the effectiveness of interactive multimedia as a tool for character education. In particular, it would be beneficial to explore how long-term exposure to multimedia interventions might influence discipline and other character traits. The study also opens the door for further exploration into the use of multimedia in early childhood education. The findings suggest that interactive media can play a significant role in shaping children's behavior and character development. Given the increasing integration of technology in education, it is crucial to consider how multimedia tools can be utilized to complement traditional teaching methods and enhance students' overall learning experiences. Overall, the results of this study highlight the potential of Macromedia Flash-based interactive multimedia as an effective tool for improving the discipline character of students at RA Nahdlatul Ulama Melati. The combination of engaging content, interactivity, and consistent reinforcement appears to have fostered significant positive changes in students' behavior. This research contributes valuable insights into the growing field of multimedia-based education and its role in developing positive character traits in young children.

Discussion

The results of this study have shown that the use of Macromedia Flash-based interactive multimedia has a positive impact on improving the discipline character of students at RA

Nahdlatul Ulama Melati. These findings suggest that incorporating technology in early childhood education can be an effective strategy to enhance students' discipline, a crucial element for their academic and personal growth. The interactive multimedia presented in this study provided an engaging and innovative method of learning that helped students better understand and apply the values of discipline in their daily routines. The significant improvements observed in the experimental group highlight the potential of multimedia tools in early childhood education. Before the intervention, both the experimental and control groups displayed similar levels of discipline, with occasional lapses in punctuality, adherence to rules, and responsibility toward tasks. However, after six weeks of using interactive multimedia, the experimental group showed marked improvements in all these aspects. This suggests that the engaging nature of multimedia content played a key role in capturing the students' attention and fostering positive behavior.

The use of Macromedia Flash, specifically, proved to be an ideal platform for this intervention. Flash allowed for the creation of visually rich and interactive content that was both stimulating and educational. Through animations, sound effects, and interactive elements, the multimedia content effectively conveyed important messages about discipline in a way that was accessible and enjoyable for young children. This method not only captured their interest but also reinforced key lessons through repetition and interactive feedback. One of the major findings of this study was the improvement in punctuality among students in the experimental group. Prior to the intervention, many students in both the experimental and control groups exhibited tardiness, which is a common issue in early childhood education. After the multimedia-based intervention, however, the experimental group demonstrated a consistent improvement in arriving on time for class. The multimedia content emphasized the importance of punctuality through fun and relatable scenarios, making the concept more tangible for the students.

The impact of the multimedia intervention was also evident in the students' adherence to classroom rules. Prior to the intervention, both groups exhibited some difficulties in following rules, which is typical of young children who are still developing self-regulation. The students in the experimental group, however, became more self-disciplined over time. They began to understand the importance of following rules without constant reminders, as the multimedia content emphasized the benefits of maintaining order and discipline in the classroom. Additionally, the students in the experimental group demonstrated increased responsibility toward their tasks and assignments. Initially, many students struggled with completing tasks independently. However, after engaging with the multimedia content, students in the experimental group became more independent in their learning. They were more eager to complete tasks, whether individually or in groups, and showed pride in their work. The interactive

nature of the multimedia content likely encouraged them to take ownership of their learning and responsibility for their actions.

The involvement of teachers played a critical role in the success of the intervention. Teachers in the experimental group were trained to effectively integrate the multimedia content into their lessons, ensuring that the students were actively engaged with the material. Teachers also provided continuous feedback to students, which reinforced the positive behaviors learned through the multimedia. Their involvement in the process helped ensure that the intervention was delivered consistently and that the students received the support they needed to develop discipline-related behaviors. Furthermore, the support of parents in reinforcing the values taught through the multimedia content was another key factor in the success of the intervention. Parents reported noticeable improvements in their children's behavior at home, including increased punctuality and responsibility for household chores. This suggests that the multimedia intervention not only influenced students' behavior in the classroom but also extended to their home lives. The collaboration between teachers, parents, and students created a more holistic approach to character development, amplifying the impact of the intervention.

Despite the overall success of the intervention, some challenges were observed during the study. While the majority of students in the experimental group showed improvements in discipline, a small subset of students struggled to maintain consistent behavior changes. This could be due to various factors, such as individual differences in learning styles, prior experiences, or a lack of reinforcement at home. These variations highlight the need for individualized approaches when using multimedia in education and suggest that additional support may be necessary for some students. In terms of statistical analysis, the data clearly demonstrated a significant difference between the experimental and control groups. The pretest and posttest results showed substantial improvements in the discipline scores of students in the experimental group, confirming the effectiveness of the multimedia intervention. The large effect size calculated for the experimental group further supports the idea that interactive multimedia can have a meaningful impact on students' behavior.

The findings of this study also align with previous research that has highlighted the positive impact of multimedia in educational settings. Studies have shown that interactive multimedia can be an effective tool for teaching various skills, including social and emotional skills, which are crucial for character development. The use of multimedia in this study reinforces the idea that technology can be an engaging and valuable tool for promoting positive behavior in young children. One of the strengths of this study was the integration of both qualitative and quantitative data. The combination of pretest and posttest scores with observational data from teachers and parents provided a comprehensive picture of the impact of the multimedia intervention. This

multi-faceted approach allowed the researchers to gain a deeper understanding of how the multimedia content influenced the students' discipline over time.

Although the results were promising, there are limitations to this study that should be considered. The study was conducted with a small sample size and over a relatively short period of time. A larger sample size and a longer intervention period would help to validate these findings and provide more robust evidence of the effectiveness of multimedia-based interventions in early childhood education. Additionally, the study was conducted at one school, so it would be beneficial to replicate this research in other educational settings to assess the generalizability of the findings. Further research could explore the long-term effects of multimedia-based interventions on discipline and other character traits. While this study focused on a six-week intervention, it would be interesting to investigate whether the improvements in discipline observed in the experimental group are sustained over time. Long-term follow-up studies could help to determine the lasting impact of multimedia on students' character development.

Another area for future research is the exploration of different types of multimedia and their effects on various aspects of character development. While Macromedia Flash was effective in this study, other platforms such as video games, interactive apps, or virtual reality might offer even more engaging and immersive experiences for young learners. Researchers could examine how different multimedia tools compare in fostering various character traits, such as responsibility, honesty, or empathy. The findings of this study also have important implications for educators and policymakers. The success of multimedia-based interventions in improving discipline suggests that integrating technology into the curriculum could be a valuable strategy for promoting positive behavior in young children. Schools may consider adopting multimedia tools to complement traditional teaching methods and create more engaging learning environments that foster the development of important life skills. Additionally, the study underscores the importance of teacher training and support in the successful implementation of multimedia interventions. Teachers who are well-trained in using multimedia tools are better equipped to engage students and integrate technology into their lessons effectively. Ongoing professional development for educators in the use of multimedia could enhance the impact of these interventions. In conclusion, the results of this study support the idea that Macromedia Flash-based interactive multimedia can be an effective tool for improving discipline in early childhood education. By providing an engaging and interactive learning experience, multimedia can help students internalize the values of discipline, responsibility, and punctuality. The positive impact observed in the experimental group highlights the potential of technology to foster character development in young children and suggests that multimedia can play an important role in shaping the future of education.

Conclusion

The findings of this study demonstrate that the use of Macromedia Flash-based interactive multimedia can significantly improve the discipline character of students at RA Nahdlatul Ulama Melati. The analysis of both qualitative and quantitative data, including pretest and posttest scores, as well as observational data from teachers and parents, provides strong evidence of the positive impact of multimedia on student behavior. The pretest results revealed that both the experimental and control groups had similar discipline levels at the outset of the study. On average, both groups scored moderately on aspects of punctuality, adherence to classroom rules, and responsibility toward tasks. However, after six weeks of exposure to the interactive multimedia intervention, the experimental group demonstrated significant improvements. The posttest data showed that students in the experimental group exhibited higher punctuality, improved adherence to classroom rules, and greater responsibility in completing tasks. The statistical analysis of pretest and posttest scores confirmed that these improvements were statistically significant ($p\text{-value} < 0.05$), suggesting that the multimedia intervention contributed directly to the positive changes observed. Specifically, the experimental group showed a 30% increase in punctuality, as the percentage of students arriving on time improved from 60% in the pretest to 90% in the posttest. Additionally, the adherence to classroom rules improved by 25%, with students in the experimental group demonstrating a noticeable reduction in disruptive behaviors. Teachers and parents reported increased responsibility among students, with a 20% improvement in task completion and more proactive participation in classroom activities. The control group, which did not receive the multimedia intervention, showed only minimal changes. While some students exhibited slight improvements in discipline, their posttest scores remained largely unchanged compared to the pretest, with an average increase of only 5-10% in punctuality and task completion. These findings underscore the effectiveness of the multimedia approach in fostering discipline compared to traditional methods. Qualitative observations further supported the quantitative data. Teachers noted that the experimental group students were more engaged in class activities, required fewer reminders to follow rules, and demonstrated a better understanding of the importance of discipline. Parents of students in the experimental group also reported that their children exhibited more punctuality and responsibility at home, reinforcing the idea that the lessons learned through multimedia extended beyond the classroom. Overall, the data from this study provide strong evidence that interactive multimedia, specifically Macromedia Flash, is a valuable tool for improving discipline among young students. The significant improvements observed in the experimental group highlight the potential of multimedia to support the development of important character traits like punctuality, responsibility, and adherence to rules. These findings suggest that incorporating multimedia tools into early childhood education could be an effective strategy for fostering discipline and other essential life

skills. In conclusion, the integration of Macromedia Flash-based interactive multimedia into the curriculum at RA Nahdlatul Ulama Melati was successful in enhancing student discipline. Given the significant improvements in both qualitative and quantitative data, it is recommended that multimedia-based interventions be considered for broader application in early childhood education. Further research with a larger sample size and longer duration would be valuable to validate these findings and explore the long-term effects of multimedia-based character development programs.

References

- Arikunto, S. (2002). *Prosedur Penelitian*. Bandung: Rineka Cipta.
- Dasopang, M. D., Lubis, A. H., & Dasopang, H. R. (2022). How do Millennial Parents Internalize Islamic Values in Their Early Childhood in the Digital Era? *AL-ISHLAH: Jurnal Pendidikan*, 14(1), 697–708.
- Dasopang, M. D., Nasution, I. F. A., & Lubis, A. H. (2023). The Role of Religious and Cultural Education as A Resolution of Radicalism Conflict in Sibolga Community. *HTS Theological Studies*, 79(1), 1–7.
- Erawadi, E., Hamka, H., & Juliana, F. (2017). The Analysis of Student's Stressed Syllables Mastery at Sixth Semester of TBI in IAIN Padangsidimpuan. *English Education: English Journal for Teaching and Learning*, 5(1), 44–57.
- Fatimah, A., & Maryani, K. (2018). Visual Literasi Media Pembelajaran Buku Cerita Anak. *Jurnal Inovasi Teknologi Pendidikan*, 5(1), 61–69. <https://doi.org/10.21831/jitp.v5i1.16212>
- Gogahu, D. G. S., & Prasetyo, T. (2020). Pengembangan Media Pembelajaran Berbasis E-Bookstory untuk Meningkatkan Literasi Membaca Siswa Sekolah Dasar. *Jurnal Basicedu*, 4(4), 1004–1015.
- Hamka, H. (2023). The Role of Principals on Teacher Performance Improvement in a Suburban School. *QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama*, 15(1), 371–380.
- Hamka, H., Suen, M.-W., Anganthi, N. R. N., Haq, A. H. B., & Prasetyo, B. (2023). The Effectiveness of Gratitude Intervention in Reducing Negative Emotions in Sexual Abuse Victims. *Psikohumaniora: Jurnal Penelitian Psikologi*, 8(2), 227–240.
- Harahap, S. M., & Hamka, H. (2023). Investigating the Roles of Philosophy, Culture, Language and Islam in Angkola's Local Wisdom of 'Dalihan Na Tolu.' *HTS Teologiese Studies/Theological Studies*, 79(1), 8164.
- Hendrawati, S., Rosidin, U., & Astiani, S. (2020). Perilaku hidup bersih dan sehat (PHBS) siswa/siswi di sekolah menengah pertama negeri (SMPN). *Jurnal Perawat Indonesia*, 4(1), 295–307. <https://doi.org/https://doi.org/10.32584/jpi.v4i1.454>

-
- Lubis, A. H. (2019). Upaya Peningkatan Hasil Belajar Siswa Sekolah Dasar melalui Model Cooperative Learning Tipe Numered Heads Together. *FORUM PAEDAGOGIK*, 11(2), 127–143.
- Lubis, A. H. (2023). The Interactive Multimedia Based on Theo-Centric Approach as Learning Media during the Covid-19 Pandemic. *JPI (Jurnal Pendidikan Indonesia)*, 12(2), 210–222.
- Lubis, A. H., & Dasopang, M. D. (2020). Pengembangan Buku Cerita Bergambar Berbasis Augmented Reality untuk Mengakomodasi Generasi Z. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 5(6), 780–791.
- Lubis, A. H., Dasopang, M. D., Ramadhini, F., & Dalimunthe, E. M. (2022). Augmented Reality Pictorial Storybook: How does It Influence on Elementary School Mathematics Anxiety? *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 12(1), 41–53.
- Lubis, A. H., & Wangid, M. N. (2019). Augmented Reality-assisted Pictorial Storybook: Media to Enhance Discipline Character of Primary School Students. *Mimbar Sekolah Dasar*, 6(1), 11–20. <https://doi.org/10.17509/mimbar-sd.v6i1.16415>
- Lubis, A. H., Yusup, F., Dasopang, M. D., & Januariyansah, S. (2021). Effectivity of Interactive Multimedia with Theocentric Approach to the Analytical Thinking Skills of Elementary School Students in Science Learning. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 11(2), 215–226.
- Manshur, U., & Ramdlani, M. (2019). Media audio visual dalam pembelajaran PAI. *Al-Murabbi: Jurnal Pendidikan Agama Islam*, 5(1), 1–8.
- Mardhiyah, R. H., Aldriani, S. N. F., Chitta, F., & Zulfikar, M. R. (2021). Pentingnya Keterampilan Belajar di Abad 21 sebagai Tuntutan dalam Pengembangan Sumber Daya Manusia. *Lectura: Jurnal Pendidikan*, 12(1), 29–40.
- Ningsih, Y. S., Mulia, M., & Lubis, A. H. (2023). Development of Picture Storybooks with TheoAnthropoEco Centric Approach for Elementary School Students. *AL-ISHLAH: Jurnal Pendidikan*, 15(2), 1888–1903.
- Nurhidayah, I., Asifah, L., & Rosidin, U. (2021). Pengetahuan , Sikap dan Perilaku Hidup Bersih dan Sehat pada Siswa Sekolah Dasar. 13(1), 61–71. <https://doi.org/10.32528/ijhs.v13i1.4864>
- Pebtiyanti, I., Ahmad, A., Dzaky, M., Fauziah, S. N., Rendi, & Puspitasari, P. (2023). Peran kurikulum merdeka dalam meningkatkan harmonisasi antara masyarakat dan sekolah. *Jurnal Pacu Pendidikan Dasar*, 3(1), 269–277. <https://doi.org/https://doi.org/10.22021/pacu.v3i1.411>

-
- Rahmah, S., & Lubis, A. H. (2024). Problem Posing as a Learning Model to Improve Primary School Students' Mathematics Learning Outcomes in Gayo Lues. *Journal of Indonesian Primary School*, 1(4), 93–104.
- Rahman, A., Munandar, S. A., Fitriani, A., Karlina, Y., & Yumriani. (2022). Pengertian Pendidikan, Ilmu Pendidikan dan Unsur-Unsur Pendidikan. *Al Urwatul Wutsqa: Kajian Pendidikan Islam*, 2(1), 1–8.
- Ranisa, R., Erawadi, E., & Hamka, H. (2018). Students' Mastery in Identifying Adverbs at Grade VIII SMPN 2 Batang Toru Tapanuli Selatan. *ENGLISH EDUCATION JOURNAL: English Journal for Teaching and Learning*, 6(2), 241–252.
- Ricardo, R., & Meilani, R. I. (2017). Impak Minat dan Motivasi Belajar terhadap Hasil Belajar Siswa. *Jurnal Pendidikan Manajemen Perkantoran (JPManper)*, 2(2), 188–201.
- Santi, Undang, & Kasja. (2023). Peran Guru PAI dalam Membentuk Karakter Peserta Didik di Sekolah. *Jurnal Pendidikan Tambusai*, 7(2), 16078–16084. <https://doi.org/https://doi.org/10.31004/jptam.v7i2.8918>
- Sugiyono. (2018). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.

