

Research Article

Implementing Visual Media Based on Local Wisdom to Improve Students' Learning Outcomes

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ABSTRACT

This study aims to examine the effect of implementing visual media based on local wisdom on students' learning outcomes at SMAN 6 Lhokseumawe. The background of this research is grounded in the importance of using instructional media that is contextual, engaging, and relevant to the students' cultural environment. This research employs a quantitative approach with a quasi-experimental design of the Nonequivalent Control Group Design type. The research subjects consisted of students in class XI A as the experimental group and XI B as the control group, with 30 students in each class. The instruments used included pretest and posttest assessments to measure students' learning outcomes, as well as observation sheets to support data on classroom activities. The analysis results showed that the average posttest score of the experimental class (82.7) was higher than that of the control class (71.3). The t-test results indicated a significance value (p) of $0.003 < 0.05$, which means there was a statistically significant difference between the two groups. Therefore, visual media based on local wisdom proved to be effective in enhancing students' learning outcomes. Instructional media that incorporates local cultural elements not only improves cognitive understanding but also strengthens students' identity and character values. Accordingly, the use of local wisdom-based media is recommended to be integrated into the school learning process.

Keywords: Visual Media; Local Wisdom; Learning Outcomes; Contextual Learning

1. INTRODUCTION

In the rapidly advancing era of globalization, the challenges in education are not only limited to mastering academic content but also include the ability to preserve local cultural identity, which is increasingly eroded by external cultural influences. The educational process, particularly in schools, should ideally serve not only as a means of knowledge transfer but also as a platform for character building and the preservation of local wisdom values. This underscores the importance of integrating local elements into the learning process, one of which is through the use of visual and contextual learning media. Instructional media is one of the key components in the teaching and learning process. Visual media—such as images, videos, digital illustrations, and infographics—play a significant role in capturing students' attention, clarifying subject matter, and assisting students in understanding abstract concepts (Wulandari, 2023).

According to Heinich et al. (2005), visual media can enhance students' memory retention of the subject matter by engaging multiple senses in the learning process. The use of appealing and contextual visual media has been proven to significantly improve learning outcomes, particularly in instructional settings that require the visualization of abstract concepts.

According to observations and several research findings, the use of instructional media in schools remains general and often fails to consider the local context of students. Learning content tends to be too abstract or oriented toward foreign cultures that lack relevance to students' everyday experiences. Consequently, the learning process becomes less meaningful, and student engagement decreases, which directly affects learning outcomes particularly in terms of conceptual understanding and learning motivation (Sanjaya, 2010). Meanwhile, local wisdom is a form of cultural wealth that reflects the values, traditions, and practices of local communities. It contains highly contextual learning content infused with social, ethical, and spiritual values relevant to students' lives. Integrating local wisdom into the learning process can strengthen students' sense of identity, enhance emotional engagement, and foster pride in their cultural heritage (Zubaedi, 2011).

The integration of local wisdom into visual learning media represents a pedagogical innovation aligned with the Contextual Teaching and Learning (CTL) approach. Through this approach, students learn within the context of the real world not only in terms of their social environment but also their cultural surroundings. When students encounter and utilize media that reflect their own cultural background, they feel more connected and motivated to learn (Depdiknas, 2008). This makes learning more dynamic, meaningful, and impactful in the long term.

In this context, the implementation of visual media based on local wisdom becomes highly significant. Such media are not merely teaching aids but also tools for cultural preservation and the transmission of local values (Habibi, 2025). This study is motivated by the problem of low student achievement, partly caused by the lack of instructional media relevant to students' cultural environment. Furthermore, many teachers still lack the competence or awareness of the importance of using culturally grounded instructional media. Low student learning outcomes serve as an indicator that the learning process has not been fully successful. Learning outcomes are influenced not only by students' internal factors, such as cognitive abilities and motivation, but also by external factors, including the teaching methods and media employed by teachers (Slameto, 2010). Therefore, it is essential to develop instructional media that are not only engaging but also culturally meaningful.

Grounded in this background, the present study aims to explore and implement visual media based on local wisdom within classroom instruction. The primary focus is to determine the extent to which such media can improve student learning outcomes and to understand how students respond to learning tools that are closely tied to their cultural identity. The visual media utilized in this study may include illustrations of local figures, videos of traditional practices, cultural maps, or other visual representations directly related to the students' cultural context. More specifically, this study formulates the following key research questions: (1) How is the process of implementing visual media based on local wisdom carried out in classroom learning? (2) Does the use of local wisdom-based visual media positively impact student learning outcomes? (3) What challenges and opportunities do teachers face in developing and applying such media?, and the objectives of this research are: (1) To describe the process of implementing visual media based on local wisdom in the school environment; (2) To determine the effectiveness of such media in improving student learning outcomes; and (3) To identify supporting and inhibiting factors in the development and implementation of local wisdom-based visual media.

As a solution, this study proposes the development of a visual media model that incorporates local cultural content aligned with the basic competencies of the national curriculum. This media will be collaboratively developed by teachers, students, and the surrounding community to ensure the authenticity of the local values being presented. Through the implementation of this media, it is expected that students' learning outcomes will improve across cognitive, affective, and psychomotor domains. Through this approach, learning is envisioned not only as an academic process but also as a humanistic and cultural one. Visual media based on local wisdom will serve as a bridge between classroom content and students' real-world experiences, making learning more contextual, interactive, and grounded (Sari, 2024). Furthermore, this media can be a form of educational contribution to the preservation of local culture, which is increasingly neglected by younger generations. This study not only evaluates the effectiveness of instructional media but also seeks to raise awareness that education can and should function as a means of cultural preservation. In the long term, this strategy is expected to strengthen students' local identity, enhance their academic performance, and shape character rooted in the nation's cultural heritage.

2. RESEARCH METHOD

This study employed a quantitative approach with a quasi-experimental research design. This approach was chosen to examine the effect of implementing visual media based on local wisdom on students' learning outcomes by comparing the results between a treatment group (utilizing local wisdom-based media) and a control group (utilizing conventional media) (Syahrizal, 2023). The research design used was the Nonequivalent Control Group Design, in which two non-randomly selected groups received different treatments (Abraham, 2022). The research was conducted at SMAN 6 Lhokseumawe, selected due to its student population with a strong local cultural background and the accessibility of the site for the researcher. The study was carried out over a period of three months, from April to June 2025, and involved several stages: preparation, implementation of treatment, data collection, and data analysis. The population of this study consisted of all 11th-grade students at SMAN 6 Lhokseumawe during the 2024/2025 academic year. The sample was selected using purposive sampling, targeting two classes with relatively similar characteristics based on previous exam scores and socio-cultural backgrounds. Class XI A was designated as the experimental group (taught using local wisdom-based visual media), while Class XI B served as the control group (taught using conventional visual media).

This finding aligns with the assertion of Heinich et al. (2005), who stated that visual media can help clarify abstract concepts and enhance understanding through visualization. Moreover, when visual media are designed based on cultural contexts familiar to students, their emotional engagement in the learning process tends to increase, thus fostering greater attention, interest, and comprehension. In the local context, integrating local wisdom into instructional media is essential, as it reinforces cultural identity and fosters more contextual and meaningful learning experiences. As noted by Zubaedi

(2011), local wisdom encompasses noble values that reflect community life and can serve as sources for character education and the strengthening of students' national awareness. This aligns with the Contextual Teaching and Learning (CTL) approach, which emphasizes the importance of linking academic content to students' real-world experiences and personal contexts (Hulaimi, 2019). Through this approach, visual media based on local wisdom not only convey information but also foster deeper, more applicable understanding. When students see their culture acknowledged and included in the learning process, they feel respected, more motivated, and more responsible for preserving local heritage (Rusman, 2011). Another contributing factor to the successful learning outcomes in the experimental group was the relevance of the visual media to students' everyday lives. In this study, the visual materials featured cultural symbols from Aceh traditions, such as Rumoh Aceh (traditional house), Aceh embroidery patterns, and community activities like peusijek (a traditional welcoming ritual) all of which were familiar to students at SMAN 6 Lhokseumawe. This is in accordance with Sadiman et al. (2012), who emphasized that the effectiveness of visual media depends on their relevance to students' backgrounds and their comprehension of the symbols presented.

Moreover, student engagement was noticeably higher in the experimental class. Observations indicated that students were more enthusiastic, actively participated in discussions, and asked questions about the cultural content delivered through the media. This active participation suggests that local wisdom-based media are not only informative but also educational and dialogical in nature. The instruments used in this study included: Learning Outcome Tests: A set of 20 multiple-choice questions, validated and tested for reliability, designed to measure students' understanding before and after treatment. Data Analysis Procedures: Quantitative data analysis was conducted through the following steps: Normality and Homogeneity Tests: To assess whether the data from both groups were normally distributed and homogeneous prerequisites for parametric testing. Independent Sample t-Test: Used to determine whether there was a significant difference in learning outcomes between the experimental and control groups following the treatment (Paisal, 2021). In line with several relevant studies as follows, The ethno-pedagogical approach is specifically focused on education by introducing local Aceh wisdom such as the Seudati dance which uses movement patterns in mathematics learning, Jeungki as a traditional tool that is starting to be abandoned, even most of the millennial generation is no longer familiar with Jeungki which is found in science learning, and what is related to history learning is the local wisdom of Peusijek (Fatmi, 2022). Furthermore, Fatmi's research also stated that the research results showed that the implementation of the Ethnopedagogy Module which combines local wisdom and cultural context into science education in a good and correct manner resulted in enthusiastic student involvement and contextual learning experiences (Fatmi, 2024). According to Maharani, the results of his research show that the Discovery Learning approach that focuses on independent exploration and discovery, when combined with local cultural values through ethnopedagogy, is effective in building positive character in students. Culture-based learning not only enriches students' understanding of their cultural identity but also encourages students' active involvement in appreciating and internalizing relevant social values (Maharani, 2024). According to Zaradiva in his research, the activities contained in the Woet Ie Bu Peudah tradition can be implemented in Biology learning in the classroom. There are several Biology materials that are in accordance with the activities in the Woet Ie Bu Peudah tradition. The study of indigenous science (society) and scientific science supports and enriches learning in the classroom. The implementation of Ethnopedagogy of local wisdom Ie Bu Peudah in Biology learning helps create a more interesting and meaningful learning experience. To ensure the success of the implementation of local wisdom in learning, a strong commitment and cooperation are needed between educators, students and the local community (Zaradiva, 2024).

3. RESULTS AND DISCUSSION

3.1. Results

The research was conducted at SMA Negeri 6 Lhokseumawe, located in Baloi Punteuet Village, Baloy, Blang Mangat District, Lhokseumawe City, during the even semester of the 2023/2024 academic year, focusing on science subject matter. The school is equipped with various facilities that support teaching and learning activities and is known for its active efforts to integrate local culture-based approaches into the instructional process. The study was carried out during the even semester of the 2024/2025 academic year, with the research subjects being 11th-grade students. The study was conducted in two classes: Class XI A (experimental group), which utilized visual media based on local wisdom during instruction, and Class XI B (control group), which employed conventional instructional media. Each class consisted of 30 students. The researcher administered a pretest and posttest to both groups in order to examine the effect of local wisdom-based visual media on students' learning outcomes. The following presents the average pretest scores of both classes.

Table 1. Average Pretest Scores of the Two Classes

Class	N	Average value	Standard Deviation
XI A	30	56.2	8.7
XI B	30	55.4	9.1

Interpretation, both classes demonstrated relatively equal initial abilities before the treatment was administered. After the instructional intervention, the posttest results showed the following improvements:

Table 2. Average Posttest Scores

Class	N	Average value	Standard Deviation
XI A	30	82.7	7.5
XI B	30	71.3	8.9

Interpretation, a more significant improvement was observed in Class XI A (experimental group) compared to Class XI B (control group). The graphical representation is presented as follows:

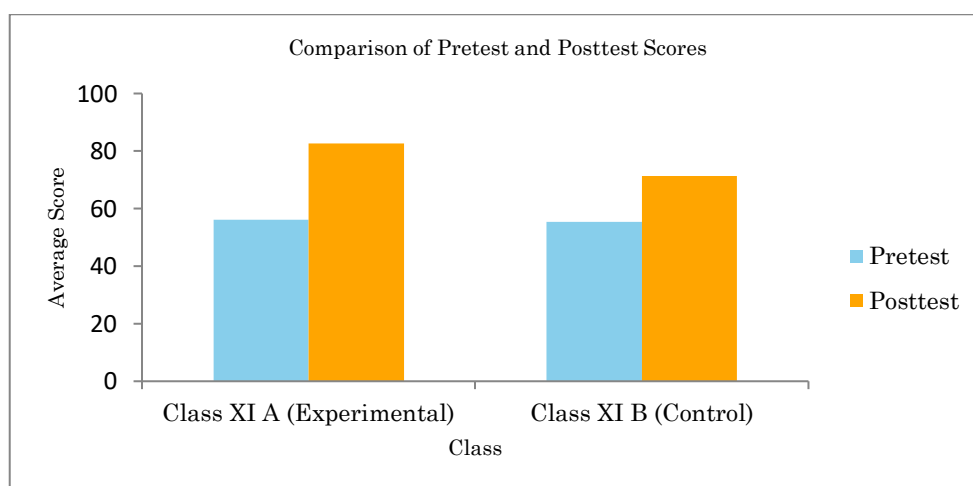


Figure 1. Graph of Pretest and Posttest Values

The results of the Independent Sample t-Test between the experimental and control classes are as follows:

Table 3. t-Test results

Group	N	Average	Standard Deviation	t-count	Sig. (2-tailed)	Interpretation
Experimental Class (XI A)	30	82.7	7.5	3.12	0.003	There are significant differences
Control Class (XI B)	30	71.3	8.9			

The purpose of the t-test in this study was to determine whether there was a significant difference between the posttest scores of students in the experimental class (Class XI A), which utilized visual media based on local wisdom, and those in the control class (Class XI B), which used conventional media. The analysis revealed that the average learning outcome score in the experimental class was 82.7, while in the control class it was 71.3. The calculated t-value was 3.12, with a significance level (p-value) of 0.003. Since the p-value is less than 0.05, it can be concluded that there is a statistically significant difference between the learning outcomes of the two groups. The improvement in learning outcomes in the experimental class using visual media based on local wisdom was significantly higher than in the control class. This indicates that media grounded in local wisdom is effective in enhancing students' comprehension and learning achievement. The results of the t-test in this study showed a significant difference between the posttest scores of students in the experimental class who used local wisdom-based visual media and students in the control class who used conventional media. The higher average learning outcomes in the experimental class (82.7 compared to 71.3) and the significance value of $p = 0.003$ ($p < 0.05$) indicate that the use of local wisdom-based media has a positive impact on students' understanding of concepts and learning outcomes. This finding is in line with research by Sari et al. (2023) which states that the integration of local wisdom in learning media can increase students' motivation and involvement cognitively and affectively. In addition, a study by Nugroho and Lestari (2024) also supports that a contextual approach based on local culture can strengthen the connection between learning materials and students' social realities, thereby facilitating the process of

internalizing knowledge. Rahmawati and Taylor (2023) highlighted the role of local wisdom pedagogy in shaping students' cultural identity and ecological awareness, thereby making the learning experience more meaningful both socially and personally. At the elementary school level, Ramadhani and Safitri (2024) demonstrated that interactive visual media based on local culture significantly enhances students' scientific literacy through contextualized visualization. Beyond cognitive aspects, Fitriyani and Susanto (2023) showed that a thematic approach grounded in local culture enriches the learning experience and improves students' conceptual understanding. Wahyuni and Anwar (2023) reinforced these findings by indicating that ethnoscience-based instruction not only enhances conceptual mastery but also develops students' critical thinking skills. Similar results were found by Hutagalung and Manurung (2024), who examined learning in frontier, outermost, and underdeveloped (3T) regions, showing that local culture-based media is highly relevant in bridging educational quality gaps. Putra and Ardiansyah (2024) added that ethnopedagogical approaches can foster student character, reinforce local values, and simultaneously support comprehension of academic content. Finally, Fauzan et al. (2024) confirmed that Islamic Religious Education textbooks developed through ethnopedagogical principles rooted in local wisdom can enhance the relevance, meaningfulness, and absorption of learning materials. Overall, these various studies consistently reinforce that visual media based on local wisdom has a positive impact not only on student learning outcomes, but also on affective, cognitive, and character development dimensions. This is particularly relevant in the context of 21st-century education, which emphasizes cultural preservation and sustainable development. Thus, the use of local wisdom-based visual media is not only effective in improving learning outcomes, but also strengthens students' cultural identity and critical thinking skills in the context of 21st century learning.

3.2. Discussion

This study aims to examine the effect of implementing visual media based on local wisdom on students' learning outcomes. Based on the findings presented earlier, it is evident that there was a significant improvement in the learning outcomes of students in Class XI A (experimental class) after the use of visual media incorporating local wisdom, compared to Class XI B (control class), which utilized conventional visual media. The average pretest scores of both classes were nearly equivalent, with the experimental class scoring 56.2 and the control class scoring 55.4. This indicates that both groups had comparable initial abilities prior to the intervention. However, following the learning process, the posttest score of the experimental class increased significantly to 82.7, while the control class only improved to 71.3. This finding is supported by statistical analysis, which showed a significance value of $p = 0.003 (< 0.05)$, indicating a statistically significant difference between the two groups.

The significant improvement observed in the experimental class indicates that the use of visual media based on local wisdom has a positive impact on students' learning outcomes. This finding is consistent with the perspective of Wahidin (2025), who states that visual media can clarify abstract concepts and enhance understanding through visualization. When such media are designed within a cultural context familiar to students, their emotional engagement in the learning process increases, thereby enhancing attention, interest, and comprehension. In the local context, the integration of local wisdom into learning media is essential, as it not only strengthens cultural identity but also creates more contextualized and meaningful learning experiences. As explained by Zubaedi (2011), local wisdom embodies noble values that reflect the life of the community and can serve as a source of character education as well as the reinforcement of students' national identity. This aligns with the Contextual Teaching and Learning (CTL) approach, which emphasizes the importance of connecting instructional content to real-life situations and students' personal experiences. Through this approach, visual media based on local wisdom do not merely convey information but foster deeper and more applicable understanding. When students see their culture acknowledged and integrated into the learning process, they feel valued, become more motivated, and develop a stronger sense of responsibility for preserving their local heritage (Zahrika, 2023).

Another contributing factor to the successful learning outcomes in the experimental class is the relevance of the visual media to students' daily lives. In this study, the visual media incorporated symbols of Acehese local culture such as the traditional house Rumoh Aceh, distinctive Acehese embroidery patterns, and traditional community activities like peusijek (a customary ritual) all of which are highly familiar to students at SMAN 6 Lhokseumawe. This aligns with the assertion of Sadiman et al. (2012) that the effectiveness of visual media depends on its alignment with students' backgrounds and their ability to comprehend the symbols used. In addition, student engagement was noticeably higher in the experimental class. Observations revealed that students were more enthusiastic, actively engaged in discussions, and frequently asked questions regarding the cultural content presented through the media. This active participation suggests that media based on local wisdom is not only informative but also educational and dialogic in nature. The learning process became more dynamic and interactive (Suardana, 2025). In contrast, the control class, which utilized conventional media, showed a relatively lower improvement in learning outcomes. This was primarily due to the less contextual presentation of the material, which made it difficult for students to relate the content to their real-life experiences. As a result, their cognitive processing of the information was not optimal. These findings support previous research by Wibowo (2020), which demonstrated that the use of contextual and culturally-based learning media can enhance academic achievement and promote active student engagement in the learning process. Thus, integrating educational technology with local cultural

content represents a strategic effort to improve the quality of education, particularly in regional contexts.

Nevertheless, the implementation of visual media based on local wisdom is not without challenges. These include the limited availability of digitized visual references on local culture and the lack of teacher training in developing localized media (Sukmawati, 2022). Therefore, collaboration among schools, educational authorities, and community leaders is essential to support the provision of standardized local cultural content that can be effectively used in instruction. Overall, the findings of this study affirm that the implementation of visual media based on local wisdom not only positively impacts students' cognitive learning outcomes but also contributes to the preservation of cultural values and the development of students' character. The results of this study are also in line with Khasna's research which states that the urgency of this research lies in the minimal application of interactive multimedia in learning, the importance of developing student character, and the relevance of learning strategies to the local context to prepare students to face the challenges of the 21st century (Khasna, 2024). Further research presented by Amaliya, stated that this snowball throwing learning model is not only effective in improving students' critical thinking skills, but also introduces the local wisdom of Sumenep's traditional food in a meaningful way (Amaliya, 2024).

4. CONCLUSION

The implementation of visual media based on local wisdom has a positive impact on the learning process. Students in the experimental class who engaged with locally grounded visual media demonstrated higher levels of enthusiasm and learning engagement compared to those in the control class. Learning materials presented within the context of local culture made the lessons more engaging, contextual, and easier to comprehend. Students' learning outcomes significantly improved after utilizing visual media based on local wisdom. This is evidenced by the difference in posttest mean scores between the experimental class (82.7) and the control class (71.3), as well as the t-test results, which indicated a significance value of $p = 0.003 (< 0.05)$. These findings suggest that the use of local-wisdom-based visual media is significantly more effective than conventional media. Such media can serve as a tool not only for enhancing conceptual understanding but also for preserving cultural heritage. By incorporating local elements such as symbols, customs, and the cultural environment of Aceh, students gain not only academic knowledge but also cultural values that strengthen their identity and character as members of the local community.

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