

Improving the Ability of Slow Learners to Identify Computer Hardware Types through Project-Based Visual Media in Informatics Learning for Grade VIII Students at SMP Negeri 1 Malinau Selatan Hilir

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Abstract

This study aimed to improve the ability of slow learners to identify different types of computer hardware through the use of project-based visual media in Informatics learning for Grade VIII students at SMP Negeri 1 Malinau Selatan Hilir. The integration of visual media with project-based learning was expected to help students understand computer hardware concepts more concretely, increase their engagement in the learning process, and develop their abilities through active and meaningful learning experiences. This study employed a Classroom Action Research (CAR) approach consisting of two cycles. Each cycle included four stages: planning, action, observation, and reflection. The research was conducted at SMP Negeri 1 Malinau Selatan Hilir, involving three Grade VIII students identified as slow learners. The data sources were the participating Grade VIII students. Data were collected through tests and interviews, while the research instruments consisted of project-based assignments supported by visual media. The collected data were analyzed using descriptive quantitative and qualitative methods to determine the improvement in students' ability to identify different types of computer hardware. The findings indicated that the use of project-based visual media effectively improved the ability of slow learners to identify different types of computer hardware. The improvement was reflected in students' test results, their active participation during the learning process, and their ability to complete the assigned project tasks. The learning activities became more engaging, easier to understand, and more effective in increasing students' learning motivation. Based on these findings, it can be concluded that project-based visual media are effective in improving the ability of slow learners to identify computer hardware types among Grade VIII students at SMP Negeri 1

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Malinau Selatan Hilir. Therefore, teachers are encouraged to continuously utilize visual and project-based instructional media to support more inclusive learning practices that accommodate the characteristics and needs of students with special educational needs.

Keywords: Visual Media, Informatics, Computer Hardware, Project-Based Learning, Slow Learners

INTRODUCTION

Education is conducted to improve the quality of Indonesian human resources, obtainable through formal institutions like schools. Inclusive education is an educational approach that adheres to the principle that every individual, regardless of differences, has an equal right to receive quality education in the same school environment as their peers (Hajar & Mulyani, 2017). In inclusive education, there is no discrimination based on ability, background, gender, ethnicity, religion, or physical and mental conditions (Phytanza et al., 2023). Inclusive education emphasizes the principle of equality and values student diversity, encouraging the active participation of all students in learning activities without exception (Nuyanita et al., 2024).

SMP Negeri 1 Malinau Selatan Hilir, as a junior high school institution, is required to provide proportional education and teaching to all students, including slow learners who have limited intellectual potential with IQ scores between 70-89, which makes them process information and lessons slower than their peers. Slow learners experience difficulties in following the learning of computer hardware material because, as students residing in border and remote areas, computers are still quite rare items for them to own or even see and know. Initial observation results show a distant grade disparity; the average score of Grade VIII students in general for the first semester of the 2025-2026 academic year was 87, while the average score of the three slow learners was 66. Specifically for Information and Communication Technology subjects, the general student average was 91, whereas the three slow learners averaged 62.

Research conducted by Aulia Afniar Rahmawati, Mochammad Arkansyah, and Athok Murtadlo shows that Information and Technology Education for special needs students is crucial, and hardware skills such as understanding monitors, CPUs, and keyboards are needed. To overcome these problems, the use of project-based picture media is expected to help slow learners recognize and understand computer hardware. Picture media can be interpreted as a dimensional form of something visually manifested as diverse thoughts like paintings, portraits, films, slides, and projectors (Dwi Cahyo et al., 2023). Project-based is an active learning model that



involves students directly, either individually or in groups, to achieve learning objectives through real works or products (Dinda & Sukma, 2021). Students will have a meaningful experience through exploration and presentation activities in project-based learning due to direct student involvement, making the acquired understanding more beneficial (Gaffar, 2023).

Learning is a process of incrementally building knowledge which is further expanded by the students themselves. Constructivist theory views learning as an active process of building new concepts or ideas based on realities through their experiences and interactions (Schunk, 2018). Constructivist learning is defined by building knowledge through experience, social interaction, and the real world (Yamin, 2021). In the context of special needs students, the Minister of Women's Empowerment and Child Protection Regulation Number 10 of 2011 states that children with special needs experience physical, mental-intellectual, social, or emotional limitations that significantly affect their growth and development. Therefore, this study aims to analyze the use of project-based picture media to improve the ability of slow learners to identify hardware types, supporting the inclusive education implemented at SMP Negeri 1 Malinau Selatan Hilir.

RESEARCH METHODOLOGY

This research is a classroom action research. Classroom action research is reflective research where activities start from real problems faced by teachers in the teaching and learning process, specifically for slow learners at SMP Negeri 1 Malinau Selatan Hilir, then alternative problem solving is reflected upon and followed up with planned and measurable concrete actions (Sutama, 2021: 134). There are four important steps in classroom action research according to Sukardi (2021: 212-213), namely plan, act, observe, and reflect. The researcher uses the Kemmis and Taggart model of classroom action research design.

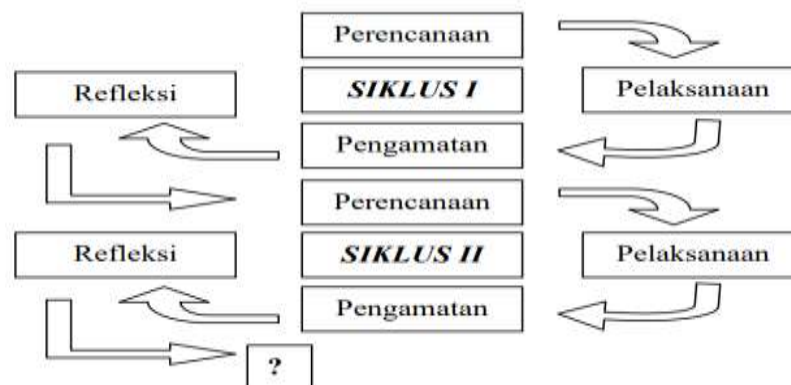


Figure 1. Classroom Action Research Design Model Kemmis and Taggart

The research was conducted at SMP Negeri 1 Malinau Selatan Hilir District, Malinau Regency, North Kalimantan Province. The research time was carried out in the even semester of the 2025-2026 Academic Year, precisely from March to June 2026 for the Information and Communication Technology subject. The subjects of this research are Grade VIII students at SMP Negeri 1 Malinau Selatan Hilir, specifically three slow learners who are included in the special needs student category, with determination provisions based on assessment and observation of students' academic abilities.

Table 1. Characteristics of Slow Learner Students' Identities

No.	Student Initials DOCX	Material Repetitions DOCX
1	CHR	2 times
2	YR	3 times
3	AR	3 times

Data collection techniques in this research use observation, interviews, questionnaires, and documentation. Observation is conducted to determine student activities during the implementation of research actions, including observing interactions between teachers and students, student behavior towards the lessons given, and classroom conditions. Interviews are conducted orally by the researcher to respondents using an interview guide, while questionnaires are administered to students using prepared questionnaire sheets. The instruments used in this research are observation sheets, interview guides, documentation tools, and oral tests using simple dialogues containing Informatics learning materials.

This research uses qualitative and quantitative data analysis techniques. Qualitative data is analyzed using qualitative descriptive analysis techniques, which process data by describing qualitative data results including observation results, field notes, and interview results. Then, quantitative data is analyzed using descriptive statistics. Test results from each cycle will be recorded and analyzed to obtain individual score data from the three slow learners and the average score, to then be compared with the Minimum Mastery Criteria (KKM) standard. The indicator of learning success is that the learning test results given at the end of each cycle meet the KKM mastery standard of 75.



RESEARCH RESULTS**Initial Ability of Special Needs Students in Understanding Information and Communication Technology Subjects**

Initial analysis revealed three slow learners in Grade VIII categorized as special needs students. An initial pretest was administered to obtain objective data regarding their understanding of computer hardware and software prior to the use of picture media. The pretest results for the three slow learners demonstrated an average score of 30. The highest score was 40 and the lowest score was 20, placing all three students entirely below the Minimum Mastery Criteria (KKM) standard of 75.

Table 2. Pretest Results of Special Needs Students

No.	Student Initials	KKM	Score
1	CHR	75	30
2	YR	75	40
3	AR	75	20

Observations conducted during the pretest execution indicated that students lacked focus in listening to materials delivered orally by the teacher. The students experienced difficulties with the material delivered through the lecture method. Furthermore, they struggled to recognize computer hardware and software, and faced difficulties understanding their functions.

Implementation and Results of Cycle I Action

The learning process in Cycle I was carried out over two meetings emphasizing computer hardware introduction and functions using project-based picture media, allowing slow learners to receive learning material information audibly and visually. Observations during the first meeting showed the three slow learners starting to display focus and enthusiasm in listening to lectures and observing the picture media. During the questioning phase, the slow learners still possessed limitations in delivering answers and opinions, showing a lack of willingness and ability to respond. By the second meeting, two slow learners, initialed CHR and YR, began showing the courage to answer and express opinions, although the other student remained hesitant.

Table 3. Post-Action Test Results Cycle I

No.	Student Initials	KKM	Score
1	CHR	75	70
2	YR	75	50
3	AR	75	60



The post-action test for Cycle I resulted in an average score of 60 for the three slow learners, with the highest score being 70 and the lowest being 50. All three scores remained below the KKM standard value. The reflection on Cycle I concluded that the slow learners still experienced difficulties recognizing and understanding hardware functions comprehensively, required repeated explanations, and struggled to answer oral questions.

Implementation and Results of Cycle II Action

Cycle II planning involved utilizing more detailed picture media depicting the forms and functions of computer hardware, linking pictures with hardware usage in daily life, providing simpler structured questions, and giving intensive mentoring to slow learners. The two meetings focused on the usage process, impact, and benefits of computer hardware. Observations indicated that the students demonstrated increased focus and concentration compared to the pretest and Cycle I activities. The three slow learners exhibited the courage and capability to provide answers and enthusiastically express their opinions regarding the learning material.

Table 4. Post-Action Test Results Cycle II

No.	Student Initials	KKM	Score	Status
1	CHR	75	80	Complete
2	YR	75	75	Complete
3	AR	75	75	Complete

The post-action test executed in Cycle II showed an improvement, where all three slow learners successfully completed the computer hardware learning material. The average score of the three slow learners reached 77, with the highest score at 80 and the lowest at 75, achieving values above the established KKM standard.

DISCUSSION

The classroom action research was conducted at SMP Negeri 1, Malinau Selatan Hilir District, Malinau Regency, North Kalimantan Province, for the Informatics subject given to Grade VIII students. This research was focused on three students in the slow learner category. Therefore, this research utilized project-based picture media to help improve the ability of the three slow learners to understand and follow learning at school.

At each meeting, the researcher presented material about hardware using project-based picture media which has the following advantages:

- increasing student participation to create project-based hardware picture media

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- increasing student participation to express their opinions
- encouraging students to be creative in finding picture media about hardware as a project

At the beginning of each cycle's activities, the teacher first gave directions regarding the project given to the students so that students already knew their tasks and roles in this action activity from the start. This helped students understand before the learning was implemented. In its implementation, students could follow the learning process using project-based picture media according to what was instructed and directed by the teacher and researcher.

The improvement of Informatics learning outcomes with the use of project-based picture media can also be proven by the increasing evaluation test results of slow learners in each cycle. This is in line with the learning outcomes theory according to experts (Sudjana, 2008:22) that learning outcomes are the abilities possessed by students after they receive their learning experience. According to Purwanto (2004:85), learning outcomes are a change in behavior, where the change can lead to better behavior, but there are also those that lead to worse behavior. The analysis results proved that the learning outcomes of slow learners could increase through the use of project-based picture media. The completeness of the three slow learners in Cycle II was 100% of the completeness standard of 75. From these data, it can be concluded that the learning for the three slow learners had improved.

The results of the teacher observation sheet analysis also showed an improvement in learning for slow learners. The improvement of Informatics learning outcomes on hardware material is because the use of project-based picture media could actively involve students in learning because they were given tasks and responsibilities through projects to make picture media about hardware. After that, students were also taught to be brave in expressing opinions and presenting their project results in making picture media about hardware.

Based on the described research, the use of project-based picture media implemented for Grade VIII students, specifically three slow learners at SMP Negeri 1 Malinau Selatan Hilir in the Even Semester of the 2025/2026 Academic Year, could improve their learning outcomes. In line with previous research, this research has the following differences and advantages:

- students were guided to be able to complete the project of making hardware picture media
- students could be creative in making picture media about hardware
- students actively expressed opinions and presented the projects they had created



CONCLUSION

Inclusive education emphasizes the principle of equality without looking at differences, ensuring that every student has the same right to receive quality education in the school environment. Teachers must be able to implement learning methods that provide ease for slow learners to understand learning materials, one of which is informatics, a subject that has a fairly high level of difficulty. The research results indicate that the use of project-based picture media is able to improve the ability of slow learners to digest computer hardware learning material better. This is demonstrated by the pretest scores where the average of the three slow learners was 30 and none had met the Minimum Mastery Criteria (KKM) standard score of 75. Subsequently, after learning was implemented through the use of project-based picture media, their average score in Cycle I increased to 60, and in Cycle II, after improvements were made to the learning method using picture media, the average score of the three slow learners increased to 77, with all three achieving scores above the established mastery standard of 75.

The research results also show that the use of project-based picture media in computer hardware learning is able to increase the self-confidence of slow learners in answering and giving opinions to questions delivered orally by the teacher. Although their answers were still brief and not yet well-structured, the three slow learners were willing and able to provide oral answers. This indicates that they had known and understood the learning material provided by the teacher.

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