



APPLICATION OF QUARTET CARD MEDIA TO IMPROVE SCIENCE LEARNING OUTCOMES CLASS VIII MTS DARUL ULUM

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Abstract

Science learning at the MTs level still often faces the problem of low student learning outcomes because the learning process tends to take place conventionally, is less interactive, and has not fully encouraged active student involvement. This condition is also found in grade VIII students of MTs Darul Ulum, where most of the students have not yet completed the learning of science subjects. This study aims to analyze the application of quartet card media in improving science learning outcomes of grade VIII students of MT Darul Ulum, describe the application process, and identify student responses to media use. Different from previous active learning studies, this study confirms the contextual evidence of PTK in MTs that simple quartet cards improve students' completeness, interaction, and learning response. The research uses the Classroom Action Research approach which is carried out in two cycles, with stages of planning, action implementation, observation, and reflection. The research subjects amounted to 22 students in grade VIII. The research instruments include learning outcome tests, observation sheets, structured interviews, and documentation. The results showed that students' learning completeness increased from 18 percent in pre-action to 40 percent in cycle I and 86 percent in cycle II. In addition, students showed a positive response in the form of increased enthusiasm, cooperation, and activeness during study. Thus, the quartet card media has proven to be effective in improving science learning outcomes while improving the quality of the learning process in a more active, fun, and meaningful way.

Keywords: Learning Outcomes, Science, Quartet Cards, Learning



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INTRODUCTION

Science learning at the MTs level requires strategies that are able to bridge abstract concepts with concrete learning experiences, but practice in the classroom is often dominated by lectures so that students are less active, less interested, and have not achieved the achievement of learning goals (Saputra, Harnipa, & Akhfah, 2021). This condition is also seen in grade VIII MTs Darul Ulum, where the results of summative assessments show that most students have not completed it, namely eighteen out of twenty-two students have not achieved the science learning goals. In that context, quartet card media is seen as relevant because it combines visual elements, games, and group interactions, and can be used without electricity so that it suits the learning needs of teachers who are practical, interesting, and easy to apply in the classroom (Lestari, Priscylio, Copriady, & Holiwarni, 2020). Thus, the discussion of the application of quartet cards in this study departs from the need to improve the process and outcomes of science learning through active, fun, contextual, and harmonious media that are in harmony with the characteristics of heterogeneous MTs level students.

A number of studies show that quartet cards have been used in various subjects and levels of education, and consistently contribute to increasing motivation, activeness, media validity, and the achievement of diverse student learning outcomes (Ayriza et al., 2021). The use of quartet card media in junior high school science learning increases learning outcomes as well as student motivation, reinforcing the assumption that educational games can be an effective means to foster high learning engagement (Akhmad & Karim, 2019). Other findings show similar effectiveness, such as the high-category N-Gain report, media validity reaching 94 percent, and strengthening critical thinking skills, so that quartet cards are not only technically attractive, but also pedagogically feasible to use (Supriyanto, 2021). The accumulation of findings confirms that the quartet card media has evolved from just a visual aid to an interactive media that provides space for discussion, collaboration, and repetition of concepts, especially in materials that demand the strengthening of students' factual understanding.

Pedagogically, the effectiveness of quartet cards can be understood through the principle of active learning that places students as the main actors in observing, asking questions, matching information, discussing, and repeating concepts through a structured and meaningful game mechanism for them (Naroh & Suratno, 2024). In science subjects, the character of this kind of media is important because many concepts are related to organs, processes, structures, or causal relationships that are easier to understand when visualized and learned through social interaction between members of small groups (Yunita & Irawan, 2025). Students become more enthusiastic, more active in working together, and understand the material faster after getting used to using quartet cards, so this media supports a conducive and participatory learning atmosphere in the classroom (Yoswanto, Kartono, & Sudrajat, 2024). Therefore, the relevant quartet card is positioned not only as a variation of methods, but as a learning tool that is able to integrate material visualization, peer collaboration, and informal evaluation of understanding in one complete learning activity.

However, the success of learning media cannot be separated from the context of the classroom, student character, teacher readiness, and material suitability, so the application of quartet cards in grade VIII MTs Darul Ulum needs to be understood based on local empirical conditions carefully. Preliminary data show low learning completeness before action, which suggests that prior learning has not fully created an active learning experience, whereas science material requires conceptual understanding built through intensive direct student involvement (Mariamah, Suastra, & Aryana, 2022). Therefore, the selection of quartet cards in this study was not an incidental decision, but an academic response to the need for learning that is more participatory, accessible, and able to stimulate students' attention without relying on digital technology devices in the classroom (Khuzaimah, Afrianti, & Inten, 2020). With this foundation, this study places quartet card media as a pedagogical intervention directed to

improve the science learning process while gradually improving student learning completeness through a continuous cycle of action, observation, reflection, and improvement.

The clear trend of improvement is that learning completeness moves from 18 percent in the pre-action to 40 percent in the first cycle and 86 percent in the second cycle after this medium is gradually used effectively. The improvement indicates that the quartet cards not only improve the learning atmosphere, but also help students understand the material through games, discussions, and repetition, so that the improvement of learning outcomes takes place as the quality of the learning process in the classroom improves (Hartt, Hosseini, & Mostafapour, 2020). The change in the activities of students who were initially shy to ask questions then became more enthusiastic and cooperative reinforces the argument that these media work on both cognitive and affective dimensions, a combination that is important in contemporary MTs-level science learning (Barz, Benick, Dörrenbächer-Ulrich, & Perels, 2023). Therefore, this state of the art study places quartet cards as an innovative, game-based, and results-oriented medium, which has proven to have the potential to answer the problem of low science learning outcomes in grade VIII MTs.

Although various previous studies have proven the effectiveness of quartet cards in science learning and other subjects, most of the studies referenced in the manuscript emphasize more on media development, validity tests, or measurement of results in different contexts (Permatasari & Puspasari, 2020). There have not been many studies that specifically examine the application of quartet cards in grade VIII students of MTs Darul Ulum through a classroom action research design that combines thoroughness evaluation, activity observation, teacher interviews, and reflection per action cycle. Another gap lies in the limited discussion of how this media changes the learning process from passive to active in science learning, even though process change is an important requirement for continuous improvement of learning outcomes in MTs classrooms. On that basis, this research fills the research gap by presenting contextual evidence regarding the effectiveness of quartet cards in science learning in class VIII MTs Darul Ulum. At the same time, it explains the dynamics of media application during two cycles of empirical action.

The novelty of this research lies in its focus that does not stop at the development or validation of media, but on the direct application of quartet cards as a science learning intervention to improve the learning completeness of grade VIII students of MTs Darul Ulum in real terms. Novelty is also seen in the use of a classroom action research approach that allows the analysis of changes in learning outcomes as well as changes in student activities, so that the effectiveness of the media is not assessed solely from test scores, but from the transformation of the learning process that occurs. In addition, this study offers a new contribution in the form of evidence that simple, inexpensive, and non-electrically independent media is still able to produce a high increase in completeness when designed according to science materials and managed reflexively by teachers (Zhai, Huang, Xiaomei, & Chen, 2023). Thus, the novelty of this study lies in the integration between visual game media, MTs context, science subjects, and cyclical improvement mechanisms, which together produce an application model that is applicable and relevant to the learning practice of madrasah teachers.

Based on the problem of low completeness of science learning, the purpose of this study is to analyze the application of quartet card media in class VIII learning of MTs Darul Ulum and assess its ability to gradually improve student learning outcomes through class actions. This study also aims to describe the process of applying media during learning, including student responses, group interaction patterns, and changes in activity that appear in each cycle, because these processes determine the success of pedagogical interventions carried out by madrasah teachers. In line with this goal, the formulation of the research problem includes whether the use of quartet cards can improve the learning outcomes of science students in grade VIII, how the process of applying it in the classroom, and how students respond during learning in the MTs. This formulation is prepared in harmony with the design of classroom

action research so that it is able to produce answers that are not only evaluative of the final results, but also diagnostics of steps to improve science learning in each cycle carried out by teachers.

RESEARCH METHOD

This study uses the Classroom Action Research design chosen because it is most in line with the purpose of the study, namely improving the learning process and improving science learning outcomes through the application of quartet card media in grade VIII students of MTs Darul Ulum (Khuzaimah et al., 2020). The research subject was one class VIII with a total of 22 students, while science teachers were involved as collaborators in action planning, learning implementation, observation, and reflection on results in each cycle. The selection of the subject was based on the initial finding that most students had not yet achieved learning completeness, so this class required concrete, participatory, and improvement-oriented pedagogical interventions. Operationally, research is carried out in two cycles, and each cycle includes the stages of planning, implementing actions, observation, and reflection so that changes in learning processes and outcomes can be monitored systematically, gradually, and sustainably according to the needs of the class, the characteristics of madrasah students, and research focuses that emphasize improving the completeness of students' science learning in a real way (Retnani, Royani, Beccles, & Afras, 2024).

The research procedure starts from the planning stage by compiling teaching tools, preparing science materials, designing quartet card game rules, and setting indicators of action success that refer to increasing the completeness and activeness of student learning (Rahmajati & Dewi, 2024). In the implementation stage, teachers implement small group-based learning, explain the material and game procedures, and then direct students to match cards, discuss, answer questions, and actively repeat concepts during the learning process (Jannati, Megawati, & Guswita, 2025). The observation stage is carried out simultaneously with actions to record students' attention, participation, cooperation, courage to ask questions, and the achievement of learning objectives. After that, reflection is carried out by the researcher and the teacher to examine test results, observation notes, and learning obstacles, then make improvements in the next cycle so that the application of quartet card media is more effective in helping the understanding of science concepts in grade VIII and increasing student involvement and achievement of learning outcomes gradually in each research cycle of this class action that is designed.

The research instruments include learning outcome tests, observation sheets, structured interview guidelines, and documentation, so that the data obtained reflect changes in cognitive achievement as well as the dynamics of the learning process during the application of quartet card media. The test is arranged in the form of five multiple-choice questions and five essay questions according to grade VIII science material, then validated and tested for reliability so that it is suitable to be used to measure student learning achievement adequately (Fajariani & Hanum, 2025). Data collection techniques are carried out through pretest and posttest, observation of learning activities during the action, teacher interviews after learning, and photo documentation as evidence of the implementation of the action (Bay, 2019). Quantitative data were analyzed using student scores, percentage of completion, and the tendency to increase in outcomes in each cycle, while qualitative data were analyzed descriptively through observation and interview results to interpret changes in learning behavior, student responses, and action effectiveness. The analysis is used as a basis for reflection to determine the next systematic, contextual, and sustainable learning improvement in the classroom (Haryanto, Aliyah, Rosadi, & Marwiji, 2024).

RESULTS AND DISCUSSION

Learning media theory emphasizes that visual and interactive aids can clarify concepts, attract attention, and strengthen student retention, so that the learning process becomes more meaningful than verbal learning that only relies on the teacher's explanation alone (Ali, Maniboey, Megawati, Djarwo, & Listiani, 2024). In the context of this study, the quartet cards are relevant because they combine pictures, brief information, rules of play, and small group interactions, so that grade VIII students of MTs Darul Ulum are encouraged to observe, match, discuss, and repeat active science material. This view is in line with research findings in the manuscript that show that the use of quartet cards makes learning more interactive and enjoyable, and correlates with a more pronounced increase in learning completeness from pre-action to the second cycle (Fanani & Fardani, 2025). Thus, the theory of educational game media provides the basis that quartet cards are not just a variation of activities, but a pedagogical means to build attention, participation, collaboration, and strengthening of science concepts through a structured and contextual effective learning experience.

Learning outcome theory views learning success as a change in cognitive, affective, and behavioral abilities that appear after students participate in learning experiences, so that increased grades, activeness, and student responses can be used as indicators of the success of these learning actions (Wahyuningsih, 2020). In classroom action research, these changes are observed through a cycle of planning, implementation, observation, and reflection, because the improvement of science learning outcomes is not only determined by the final test, but also by the quality of the learning process that takes place in a sustainable manner. This theoretical framework is in accordance with the research method that uses tests, observations, interviews, and documentation, because the improvement in learning outcomes of grade VIII students of MTs Darul Ulum must be read as the result of interaction between media, activities, and teachers' reflections (Afiana, Supriyantini, & Ahsani, 2025). Therefore, constructivist theory and active learning are the main foothold of this research, as both place students as subjects who build understanding through direct experience, group discussions, and intensive engagement during the use of the quartet cards.

Table 1. Improving Student Learning Outcomes

Research Stage	Number of Students Completed	Completion Percentage
Pre-action	4 students	18%
Cycle I	9 students	40%
Cycle II	19 students	86%

The findings of the study show that the application of quartet card media in science learning in class VIII MTs Darul Ulum resulted in a real increase in learning outcomes from the pre-action stage to cycle II. Before the action was given, classroom conditions showed low learning completion, with only 4 out of 22 students or 18 percent achieving the completion criteria. After the actions in the first cycle were implemented through group learning assisted by quartet cards, the number of students increased to 9 people or 40 percent. This increase indicates that the use of media that combines visual, game, and interaction elements is starting to have a positive impact on students' understanding of science concepts (Luthfiani et al., 2026). In cycle II, after improvements were made based on the results of reflection, the number of students who achieved completeness increased again to 19 people or 86 percent, thus showing the effectiveness of gradual, consistent, and pedagogical actions in the context of madrasah learning that are relevant to the research objectives originally proposed.

In addition to increasing completeness, the observation results show changes in the learning process that are increasingly active in each action cycle. In the first cycle, some students still seemed embarrassed to ask questions, did not fully understand the rules of the game, and did not consistently discuss effectively in groups (Fahmi, Wiguna, & Hasbullah, 2023). However, the use of quartet cards begins to encourage students to pay attention to the

teacher's explanations, work together to match the cards, and respond to learning questions more enthusiastically than in the initial condition (Mutmainah, Gunawan, & Meldina, 2025). Improving strategies in cycle II has an impact on increasing student participation, both in discussions, group cooperation, and the courage to ask questions. Students also seem to understand the material faster because the information on the cards helps them connect concepts, terms, and examples concretely. These findings show that the quartet card media functions not only as a visual aid, but also as an active learning tool that strengthens students' interaction, motivation, and learning engagement during science learning in the classroom studied.

The results of tests, observations, and teacher interviews together show that the success of the implementation of quartet card media is not only reflected in the increase in completeness rates, but also in the improvement in the quality of students' learning experience during science learning (Amalia, Roysa, & Ismaya, 2020). Teachers assessed that learning became more directed, easier to manage, and more conducive after students understood the game mechanics in cycle II. From a theoretical point of view, these results reinforce the view that visual-interactive media and active learning can help students build understanding through direct experience, repetition, and social interaction in small groups (Fadil, Rahmadila, Nurafifah, & Mustaqim, 2025). From a methodological point of view, the consistency of the improvement of test results with observational findings strengthens the validity of the findings of this class action research (Ihsan, Syahfitri, Bahri, Zahari, & Awalia, 2024). Thus, the results of the study confirm that the application of quartet card media is effective in improving the learning outcomes of science class VIII MTs Darul Ulum while improving the learning process systematically, contextually, and sustainably according to the objectives, design, and theoretical framework of this research.

The application of quartet card media has been proven to improve the science learning outcomes of grade VIII MTs Darul Ulum students, as shown by the increase in the percentage of learning completeness from the pre-action stage, cycle I, to cycle II (Rahmawati, Saputro, Ayu, Rahmawati, & Saputro, 2024). In the initial condition, only 4 out of 22 students or 18 percent achieved completeness, which shows that previous learning has not been able to optimize the understanding of science concepts adequately. After the quartet card media was applied in cycle I, completeness increased to 40 percent, then increased again to 86 percent in cycle II. The increase shows that the use of visually, interactive, and game-based media contributes significantly to improving student learning outcomes (Nabila, Fiqry, & Nurjumiati, 2025). Thus, the answer to the formulation of the first problem is that the use of quartet card media effectively improves science learning outcomes, because the actions taken produce quantitative changes that are consistent and relevant to the research objectives of this class action in the context of MTs learning.

The improvement in learning outcomes cannot be separated from the characteristics of quartet card media which allows students to learn through activities of matching information, discussing, remembering terms, and connecting concepts gradually during science learning in the classroom (Fanani & Fardani, 2025). In the research paper, it was explained that the quartet cards were chosen because they combined game and visual elements, so that they were in accordance with the needs of students who tend to learn more easily when actively and funly. Theoretically, visual-interactive media help students understand abstract concepts, while educational games strengthen attention, motivation, and knowledge retention (Nurhalisa, Sirwanti, & Paronda, 2025);(Noftianto, 2025). Therefore, the improvement of learning completeness in this study is not a stand-alone finding, but in line with the theoretical foundation that places students as active subjects in building their understanding. When students are directly involved in the learning process, science information that was initially difficult to understand becomes more concrete, structured, and easy to remember through meaningful group learning experiences.

From a methodological perspective, the effectiveness of quartet card media in improving learning outcomes is also strengthened by the use of classroom action research design which is carried out in two cycles, each through the stages of planning, action, observation, and reflection (Lailiyah & Masrifatin, 2025);(Yulianasari, Putra, Sundahry, Muhammadiyah, & Bungo, 2025). This design allows researchers not only to measure the final results, but also to improve the implementation of actions based on the findings of the previous cycle. In the first cycle, the increase in completeness has indeed occurred, but it is not optimal because some students are still not familiar with the game mechanics and have not been consistently active. The results of reflection on these conditions are then used to improve learning strategies in cycle II, including classroom management and teacher direction during the activity. Consequently, learning completeness increased more sharply in cycle II, which shows that the success of quartet card media lies not only in the medium, but also in the quality of implementing actions in a reflective, systematic, and sustainable manner.

The findings of this study also show that the improvement of science learning outcomes is closely related to changes in the quality of the learning process in the classroom. In the early stages, science learning tends to take place conventionally and less interestingly, so students are less active, less motivated, and have not shown adequate achievement of learning goals. After the implementation of the quartet cards, students begin to engage in more participatory learning activities, such as discussing, exchanging cards, answering questions, and working together in small groups. This change in process is important because learning outcomes are essentially determined not only by individual abilities, but also by a learning environment that supports interaction, attention, and repetitive comprehension exercises (Harefa, Telaumbanua, Sarumaha, Ndururu, & Ndururu, 2020). In other words, quartet card media improves learning outcomes not only because it is attractive, but because it creates an active learning mechanism that encourages students to understand science material through direct and collaborative involvement.

The results of this study are consistent with the previous study referenced in the manuscript, which stated that quartet cards are effective in improving student learning outcomes, motivation, and understanding of various learning materials (Fadilah & Budiyanto, 2026). The studies included in the manuscript show that the use of quartet cards in science learning and other fields results in high media validity, increased N-Gain, and strengthening of student learning engagement (Sulistiyono & Choirunnisa, 2024). The consistency between this study and previous research strengthens the argument that quartet cards have a stable pedagogical value as a learning medium. However, the contribution of this research lies in the contextual evidence that this effectiveness also applies to grade VIII students of MTs Darul Ulum in science learning based on classroom action research. Thus, the answer to the formulation of the first problem is not only supported by internal research data, but also obtains academic legitimacy from previous findings that are in line with the direction of the results of this research.

Substantively, the increase in learning outcomes from 18 percent to 86 percent shows that quartet card media deserves to be positioned as a strategic alternative in science learning in MTs, especially when teachers face low learning completeness and lack of student involvement. The implication of these findings is that teachers need to consider the use of media that is simple, accessible, and able to collectively enable students to understand science concepts that are often considered difficult (Imani, Gymnastiar, & Saswani, 2025). This research proves that learning innovations do not always have to be based on high technology, because even simple media such as quartet cards can produce significant changes if they are designed according to the goals, materials, and characteristics of students. Therefore, the formulation of the first problem is clearly answered that the application of quartet card media can improve the science learning outcomes of grade VIII MTs Darul Ulum students. These

findings also confirm the integration between the initial problem, method design, theoretical foundation, and empirical results obtained during the research.

The process of applying quartet card media in science learning class VIII MTs Darul Ulum is carried out through a classroom action research design consisting of two cycles, with stages of planning, implementation of actions, observation, and reflection in a systematic manner. At the planning stage, teachers and researchers prepare quartet card media according to science material, especially digestive system material, as well as prepare learning tools, test instruments, observation sheets, interview guidelines, and indicators of action success. This stage is important because the success of media is not only determined by its physical form, but also by the integration between learning objectives, teaching materials, and student activity scenarios during learning (Ayuwandari, Andriyani, & Kusumawati, 2020). In the context of this study, planning is the main foundation so that the quartet card can function as a medium that is not only interesting, but also relevant to the conceptual needs of grade VIII MTs students.

At the stage of implementing the action, teachers use quartet cards as the core medium in small group learning, so that students not only receive verbal explanations of the material, but also engage in card matching activities, exchanging information, discussing, and answering questions (Diva, 2024). This process shows that the application of quartet card media is directed to create active, collaborative, and non-monotonous learning, in accordance with the initial problems found in the preliminary stage of the research. During the action, the teacher acts as a facilitator who explains the material, gives instructions on how to play, directs group interactions, and ensures that each activity remains connected to the science learning indicators that students must achieve. The mechanism is in line with active and constructivist learning theory, which views students as subjects who build understanding through hands-on learning experiences (Muflich & Nursikin, 2023). Therefore, the process of applying this media is pedagogical, not just a game without a clear academic orientation.

Observations during the learning showed that the process of applying quartet card media took place gradually and progressed from cycle I to cycle II. In cycle I, some students were still embarrassed to ask questions, did not fully understand the flow of the game, and did not show consistent participation in group discussions. This condition shows that the use of innovative media requires an adaptation stage, especially when students were previously more accustomed to conventional passive learning patterns (Bland, 2024). However, in the first cycle, initial changes have been seen in the form of increased student attention to teachers' explanations, the emergence of cooperation between students, and the growing interest in participating in learning assisted by quartet cards. These observational findings confirm that the process of media implementation does not take place instantly, but develops through interaction between media, teachers, and student responses in the classroom.

The reflection stage after cycle I is an important component in explaining the process of applying quartet card media, because through reflection researchers and teachers evaluate test results, observation notes, and obstacles that arise during learning (Nisaak, Rondli, & Fardani, 2023). Based on this reflection, improvements were made in the second cycle, especially in class management, game direction, and student assistance to better understand the function of quartet cards as a means of learning science. This improvement shows that the process of applying media in classroom action research is dynamic and reflective, so that weaknesses in the initial cycle are not considered failures, but rather as the basis for subsequent learning improvements. From a methodological perspective, this reflection mechanism strengthens the quality of action implementation because learning is designed adaptively to the real conditions of the classroom. Therefore, the process of applying quartet card media in this study is not just a technical implementation, but a series of continuous pedagogical improvement actions.

In cycle II, the process of applying quartet card media was more effective because students began to get used to the rules of the game, better understand the purpose of the

activity, and showed higher learning involvement than in the previous cycle. Teachers are also more optimal in facilitating learning, both in explaining material, managing groups, and providing reinforcement to students' answers and discussions during activities (Muadzin, 2021). These changes have an impact on a more conducive, interactive, and purposeful classroom atmosphere, so that the quartet cards really function as a bridge between abstract science material and concrete learning activities. Within the framework of learning media theory, this success shows that visual-interactive media will work optimally when combined with good classroom management and clear learning objectives (Kurniawan, Kuswandi, & Husna, 2018). Thus, the process of implementing media in cycle II emphasizes that the effectiveness of learning does not only depend on the media, but also on the maturity of the implementation and mentoring of teachers.

The results of the observation of student activities support the discussion that the process of applying quartet card media encourages the transformation of learning from a one-way pattern to interaction-based participatory learning. The aspects observed in the text, such as attention to the teacher's explanations, the courage to ask questions, the enthusiasm for participating in the game, the cooperation of matching cards, the ability to answer questions, and group discussions, indicate that this medium presents a more lively learning space (Izzah & Hadi, 2024). In science learning, this kind of process is very important because understanding concepts is not enough to be built through memorization, but requires information processing activities, strengthening terms, and relationships between concepts repeatedly. Quartet cards facilitate these needs through activities that require students to observe, select, match, and discuss the contents of the cards continuously (Sari, Feniareny, Hermansah, & Prasrihamni, 2023). Therefore, the application process can be understood as an active learning practice that brings together visual, social, and cognitive elements in one classroom activity design.

Overall, the formulation of the second problem can be answered that the process of applying quartet card media in science learning class VIII MTs Darul Ulum takes place through planned stages, collaborative implementation, systematic observation, and continuous reflection, so that the media is used pedagogically and in a directed manner. The process begins with the preparation of devices and media, continues with the use of quartet cards in small groups, observed through observation instruments, and then refined through reflection from one cycle to the next. The results show that the quartet cards are not only applied as visual aids, but as learning strategies that actively organize students' interactions with the material, teachers, and peers. The integration between method design, active learning theory, and observation results shows that the process of applying this media is relevant to the research objectives to improve science learning (Rembang & Rembang, 2021). Thus, this discussion emphasizes that the quality of the media application process is a key factor in the success of learning actions carried out in grade VIII MTs Darul Ulum.

Students' responses to the use of quartet card media in science learning in grade VIII MTs Darul Ulum basically showed a positive trend, as reflected in changes in students' attitudes, involvement, and enthusiasm during the learning action. In the research paper, it was stated that after the media was applied, students reported learning to be more interactive and fun, an important finding because in the initial conditions of science learning tended to be passive and less interesting. The positive response is not only seen in general statements, but also seen in the increase in learning activities observed during the learning process in each action cycle. This shows that students do not simply accept the existence of media as a variation of learning, but respond to it as a learning experience that is more in line with their needs and characteristics. Thus, the use of quartet cards gained good acceptance from students both emotionally and pedagogically.

In the first cycle, the students' responses still showed the adjustment phase, because some students looked embarrassed to ask questions, did not fully understand the material, and were not familiar with the game mechanics used in science learning. However, this situation cannot

be interpreted as a rejection of the media, but rather as a form of initial adaptation to a learning model that is different from previous conventional learning habits. It is precisely at this stage that signs of positive responses begin to be seen, such as increased attention to the teacher's explanations, an increase in interest in participating in game activities, and a willingness to cooperate with group mates. The findings show that the quartet cards have a strong enough initial appeal to build student engagement. In the perspective of active learning theory, this kind of response is important because early involvement is a prerequisite for the growth of motivation, interaction, and readiness of students to build a deeper understanding of concepts (Widayanthi, Subhaktiyasa, Hariyono, Wulandari, & Andrini, 2024).

In cycle II, the students' responses became more positive and more stable than in the previous cycle, which can be seen from the increase in enthusiasm, cooperation, courage to speak up, and the speed of understanding the material learned through quartet media. Students appear to be more active in groups, more prepared to follow instructions, and more quickly adjust to the game-based learning flow. This change shows that after passing the adaptation stage, quartet card media can be accepted by students as a fun means of learning as well as helping the understanding of science material. From a pedagogical point of view, the increasingly positive response in cycle II confirms that the quality of student acceptance of the media is closely related to the clarity of the teacher's direction and the regularity of the implementation of learning. In other words, student responses are not static, but develop as the quality of action implementation increases and students' learning experience increases using these media.

The results of the observation of student activities provide a stronger empirical basis for assessing students' responses to quartet card media. The aspects observed in the instruments, such as attention to the teacher's explanations, activeness in asking questions, enthusiasm for learning, ability to work together, ability to answer questions, and participation in discussions, are direct indicators of students' responses during learning. When these aspects show positive development from cycle I to cycle II, it indicates that students are responding constructively to the use of quartet card media. This response is important because in science learning, the success of the media is not only measured through test results, but also through students' willingness to engage in learning activities that demand attention and information processing (Masrifa, Munirah, Cahyani, & Fauziyah, 2023). Therefore, the observation of the activity strengthens the conclusion that the quartet card media is actively and productively accepted by students in the context of learning in grade VIII MTs Darul Ulum.

From a theoretical perspective, students' positive responses to quartet card media are in line with visual learning media theory and constructivist theory that emphasize the importance of hands-on learning experiences, social interaction, and active involvement in building understanding (Ali et al., 2024). The quartet cards provide picture elements, concise information, and game mechanics that allow students to learn through matching, remembering, and discussing science concepts together. In situations like this, students are no longer passive recipients of information, but rather subjects who construct knowledge through fun and meaningful activities. Students' positive responses can be understood as a logical consequence of learning that leaves more room for participation, communication, and exploration of concepts. Thus, the findings of this study support the view that interactive learning media will be easier for students to accept than one-way learning that does not provide the opportunity to experience and process knowledge directly.

Positive student responses are also closely related to improved learning outcomes found in this study. When students feel interested, enthusiastic, and comfortable participating in learning, they tend to be more focused, more courageous to ask questions, and more involved in activities that support the understanding of science material (Fitriani & Umah, 2025). Therefore, student responses should not be seen as an additional aspect, but as an integral part of the mechanism of improving learning outcomes that occur during the application of quartet

card media. In the research paper, it can be seen that when students' responses got better in cycle II, learning completeness also increased significantly to 86 percent. This relationship shows that student acceptance of media is one of the indicators of the success of learning actions, because positively received media will be more effective in fostering cognitive and social involvement during the learning process in the classroom.

Overall, the formulation of the third problem can be answered that students' response to the use of quartet card media in science learning grade VIII MTs Darul Ulum is positive, evolving from the initial adaptation stage to more mature active involvement in the next cycle. This response can be seen in increased enthusiasm for learning, group cooperation, attention to learning, courage to ask questions, and ease of understanding the material presented through quartet card media. Observational data, learning outcomes, and information in the manuscript that calls learning more interactive and fun provide consistent support for this conclusion. Thus, the use of quartet card media is not only effective in improving learning outcomes, but also succeeds in creating good student acceptance of the science learning process. The findings confirm that the affective and participatory aspects of students are an important part of the successful implementation of innovative learning media in madrasah classrooms.

The novelty of this research lies in its focus which places quartet card media not just as a learning product that is developed or tested for feasibility, but as a pedagogical intervention that is applied directly to improve the science learning outcomes of grade VIII students of MTs Darul Ulum. In the text, the previous research referenced has highlighted the validity of the media, its effectiveness in other contexts, or the development of quartet cards in different subjects, while this study emphasizes real application in the design of two-cycle class action research. Another novelty appears in the integration between learning outcome measurement, observation of student activities, teacher interviews, and reflection actions to read learning changes as a whole. Thus, this study offers a new contribution in the form of contextual evidence that simple, visual, and game-based media can be a means of improving science learning in MTs in a systematic, applicative, and oriented to solving the problem of learning completeness in the classroom.

From an analytical point of view, the novelty of this research can also be seen in its success in bringing together the foundations of active and constructivist learning theory with science learning practices in madrasah classrooms through cheap, easily accessible, and non-dependent media on digital technology. The manuscript shows that the increase in completeness from 18 percent in pre-action to 40 percent in cycle I and 86 percent in cycle II takes place in line with the increase in student activity, enthusiasm, and cooperation during learning. This indicates that the novelty of research does not only lie in the type of media, but in the implementation model that makes quartet cards as a tool to organize learning interactions, not just an ordinary visual aid. In other words, this study shows that the effectiveness of media is largely determined by the synchronization between learning objectives, action procedures, continuous reflection, and students' responses to learning activities designed by teachers.

The implications of this research are theoretical and practical. Theoretically, the results of the study reinforce the view that game-based interactive learning media can improve learning outcomes when used in active, reflective, and collaborative learning designs. Practically, these findings provide a basis for science teachers in MTs to use quartet cards as an alternative learning strategy that is relevant in overcoming the low learning completeness and passivity of students in the classroom. Another implication is that effective learning innovations do not always have to be based on high technology, because even simple media can produce significant changes if they are designed according to the material, student characteristics, and classroom needs. For future researchers, this study opens up an opportunity to test the application of quartet cards to other science materials, different levels, or additional variables

such as motivation, critical thinking skills, and sustainability of learning impact in the longer term.

CONCLUSION

The application of quartet card media in science learning has proven to be effective in improving the learning outcomes of grade VIII students of MTs Darul Ulum. This effectiveness can be seen from the gradual increase in learning completeness, from 18 percent in the pre-action stage to 40 percent in the first cycle and 86 percent in the second cycle. These findings show that the use of media that combines visuals, games, and group interaction can create more active, engaging, and meaningful learning for students. The process of applying quartet card media is carried out through systematic stages of classroom action research, namely planning, implementation of actions, observation, and reflection, so that every learning obstacle can be corrected in the next cycle. In addition to improving learning outcomes, this media also encourages positive changes in student activities and responses, such as increased enthusiasm, cooperation, attention to learning, and the courage to ask questions and discuss. Thus, the quartet card media not only functions as a learning tool, but also as a pedagogical strategy that is able to improve the quality of the science learning process as a whole. This study confirms that simple learning media, if designed and applied appropriately, can be an effective alternative to overcome low student learning outcomes in madrasahs.

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