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THE IMPACT OF USING INTERACTIVE MEDIA IN SCIENCE LEARNING IN ELEMENTARY SCHOOLS ON STUDENTS' SCIENTIFIC ATTITUDES AND CONCEPT ACHIEVEMENT

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Abstract

This research aims to examine the impact of using interactive media in natural science (science) learning in elementary schools on students' scientific attitudes and concept achievement. This study was carried out using the Systematic Literature Review (SLR) method by examining various scientific articles, research reports and proceedings from the last ten years. The results of the analysis show that interactive media generally has a positive influence in fostering students' scientific attitudes, such as curiosity, thoroughness, openness to evidence, and cooperation. Apart from that, the use of interactive media has also proven effective in helping students understand abstract science concepts through visualization, simulations and more concrete and meaningful learning experiences. The link between scientific attitude and concept achievement has also been identified in a number of studies, where a good scientific attitude tends to strengthen the process of understanding concepts in depth. However, the effectiveness of interactive media is greatly influenced by various contextual factors, such as the type of media, the level of student development, and the learning strategies implemented by teachers. Therefore, the use of interactive media in science learning needs to be designed appropriately so that it is able to support learning objectives optimally, both in terms of mastery of the material and the formation of students' scientific character from an early age.

Keywords: Interactive Media, Science, Elementary School, Scientific Attitude, Concept Achievement

INTRODUCTION

Natural Sciences (Science) is one of the important subjects taught since elementary school level. Science learning aims not only to provide an understanding of natural concepts, but also to form a scientific way of thinking in students. From an early age, students need to be directed to be able to develop scientific attitudes such as curiosity, critical thinking, honesty, openness to facts, and being objective in solving problems (Anggraini, 2023).

Strong mastery of basic science concepts at elementary school level will be the foundation for successful learning at the next level. Students who understand science concepts thoroughly tend to understand complex natural phenomena more easily in the future (Sintarini & Suniasih, 2024). On the other hand, forming a scientific attitude from an early age will create a generation that is not only cognitively intelligent, but also wise in its attitude towards the environment and scientific information.

However, in practice, science learning in elementary schools still faces various challenges. Many students feel that science is a difficult and boring subject because the presentation is less interesting. Conventional and teacher-centered learning methods often do not encourage students' active involvement in the learning process, resulting in low understanding of concepts and lack of development of their scientific attitudes (Dinia & Setiyawati, 2024).

Limited teaching aids, learning media, and teachers' pedagogical abilities in managing creative learning are also factors causing the low quality of science learning. In addition, some students experience difficulty in connecting science concepts with everyday life, which causes the concepts taught to be abstract and difficult to understand (Halimatusyadiah & Disman, 2023).

Along with the development of information and communication technology, various interactive learning media have emerged that can be used to improve the quality of learning, including science learning in elementary schools. Interactive media is media that allows interaction between students and learning material through various visual, audio and simulation features. This media creates a more interesting, fun and meaningful learning environment (Chen & Tsao, 2024).

The use of interactive media in science learning can help students understand abstract concepts more concretely through animation, moving images, or experimental simulations. This can increase student involvement, build learning motivation, and foster a scientific attitude through independent exploration and discovery facilitated by this media (Tirtoni, 2023).

Several studies show that the use of interactive media contributes positively to increasing students' concept attainment and developing scientific attitudes. Students become more active in learning, more interested in following lessons, and better able to understand the relationships between concepts more fully. In other words, interactive media is able to create a richer and more meaningful learning experience (Banjarnahor & Tarigan, 2023).

However, not all interactive media implementations are optimally successful. The success of using this media really depends on the quality of the media, the way it is presented, teacher support, and the readiness of the school infrastructure (Ria & Handayani, 2024). Therefore, a more in-depth study is needed regarding the actual influence of interactive media on students' achievement of scientific concepts and attitudes in science learning in elementary schools.

Based on the description above, it is important to conduct an in-depth literature review to determine the impact of using interactive media in science learning in elementary schools, especially on students' scientific attitudes and concept attainment. It is hoped that the results of this study can become a basis for developing more effective and innovative learning strategies in improving the quality of science education at the elementary level.

RESEARCH METHOD

This research is a literature review which aims to identify, review and synthesize the results of previous research relating to the use of interactive media in science learning in elementary schools, especially in relation to students' scientific attitudes and concept achievement. This study focuses on scientific journal articles, conference proceedings, and research reports published in the last ten years (2015–2025). The literature included in this study must meet the inclusion criteria, namely discussing the use of interactive media in elementary school level science learning and including data or analysis about students' scientific attitudes or concept attainment. The exclusion criteria include research that is not relevant to the context of basic education, does not focus on science subjects, or does not contain adequate empirical information.

The steps in this literature review include several systematic stages. First, the problem is identified and the research questions are formulated which are the focus of the study. Second, a search and collection of literature was carried out from various academic databases such as Google Scholar, Scopus, and DOAJ using certain keywords such as "interactive media", "science learning", "scientific attitudes", and "primary school". Third, all collected articles were selected based on eligibility and relevance to predetermined inclusion and exclusion criteria. Fourth, an evaluation was carried out on the quality of the selected literature, both in terms of methodology, data validity and content relevance. Finally, a synthesis of the findings from various literature that has been analyzed is carried out to draw

conclusions regarding the impact of using interactive media in science learning on elementary school students' scientific attitudes and concept achievement (Earley, M.A. 2014; Snyder, H. 2019).

RESULT AND DISCUSSION

Interactive Media and Students' Scientific Attitudes

The use of interactive media in science learning in elementary schools has shown various impacts on the development of students' scientific attitudes. The most prominent impact is increasing students' curiosity and enthusiasm in studying scientific phenomena. Through attractive visual displays, animations, simulations and technology-based activities, interactive media is able to arouse students' curiosity, which is one of the main indicators of scientific attitudes (Akhtar, 2024). Students are encouraged to ask questions, explore and make observations of the material presented dynamically and interactively.

Apart from that, interactive media also contributes to fostering an objective attitude and openness to new data and information. For example, in a digital experimental simulation, students are invited to observe changes in variables, record data, and draw conclusions from the experimental results. This process encourages students to think critically and not just passively receive information (Salsabila et al., 2023). Other scientific attitudes such as cooperation, perseverance, and scientific honesty can also be developed through project-based assignments or educational games that involve interaction between students.

However, not all use of interactive media automatically has a positive impact. Several studies show that if the media focuses too much on entertainment aspects without a strong connection to learning objectives, students can actually experience distraction. In conditions like this, students' focus can shift from the scientific process to visual or game aspects, so that the scientific attitude that should be developed is neglected (Erdogdu & Erdogdu, 2022). This suggests that the impact of interactive media can be moderate or even negative, depending on how the media is designed and used.

Apart from media design, the impact of interactive media on scientific attitudes is also strongly influenced by contextual factors, such as student age. Low grade students (grades 1–3) tend to need media with a simple and concrete visual and audio approach, while high grade students (grades 4–6) are starting to be able to follow the logical flow of more complex digital

simulations or exploration. Therefore, it is very important to pay attention to the suitability of students' cognitive development levels with media characteristics.

The type of interactive media used is also a determining factor. Media based on augmented reality (AR), virtual labs, or digital simulations enable a more in-depth learning experience than static media such as ordinary video shows. Media that allows direct exploration and provides real-time feedback tends to be more effective in forming scientific attitudes because it imitates the real scientific process (Malinda et al., 2023). On the other hand, media that is too passive or only displays information without providing space for interaction is less able to foster an active scientific attitude.

The teacher's strategy in integrating interactive media into learning also plays a very important role. Good media will not be effective if it is not supported by appropriate learning approaches, such as inquiry, discovery learning, or problem-based learning. Teachers need to facilitate discussions, direct observations, and stimulate scientific questions that arise from students' interactions with the media (Toshpulatova, 2024). In this case, the teacher acts as a facilitator and motivator who ensures that the use of interactive media remains in line with the aim of forming a scientific attitude.

Thus, interactive media has great potential in forming and improving the scientific attitudes of elementary school students, but its effectiveness is very dependent on various contextual factors. It is necessary to choose the right media, develop appropriate learning strategies, and active teacher support to ensure that the learning experience provided truly encourages the development of an optimal scientific attitude.

Interactive Media and Concept Achievement

Interactive media has been proven to be an effective tool in increasing students' concept achievement in science learning in elementary schools. By presenting material visually, auditively, and kinesthetically simultaneously, interactive media helps students understand complex or abstract concepts in a more concrete and easy to digest way (Beege, 2024). For example, concepts about planetary movements or changes in the shape of objects can be visualized dynamically, so that students not only read or hear explanations, but also see the process directly.

The effectiveness of interactive media in helping understand science concepts can be seen from the increase in students' cognitive learning outcomes in various studies. Students who learn using interactive media

generally show significant improvements in concept understanding tests compared to students who use conventional methods (Ariyani & Nurdyansyah, 2024). This is because interactive media tends to facilitate active learning, making students involved in the process of exploration and discovery themselves, so that the concepts obtained become more meaningful and last longer in memory.

Concept strengthening also occurs because interactive media is able to provide direct feedback (real-time feedback). For example, in a science experiment simulation application, students can try various scenarios and immediately see the consequences of each action taken. This interaction allows students to understand cause-and-effect relationships scientifically, which ultimately helps them build a stronger conceptual understanding (Ni'mah et al., 2023).

However, the effectiveness of interactive media also depends greatly on the type of media used. Several studies show that virtual laboratory simulation-based media is superior in building conceptual understanding compared to regular learning videos. Simulations allow students to experience the scientific process actively, while videos are more passive (Higdon, 2022). On the other hand, well-designed interactive educational games can also provide good results in understanding concepts, especially if accompanied by gradual learning mechanisms and appropriate challenges.

Comparison between types of media shows that media that involves students in decision making and independent exploration is more effective than media that only presents information. However, this effectiveness still depends on the learning context, material objectives, and student readiness. Simple media such as PowerPoint-based interactive presentations or videos with interactive quizzes can be quite effective when combined with structured discussions and teacher guidance (Li, 2024).

Apart from the type of media, other factors that influence student outcomes are the duration of use and the frequency of media integration in learning. Consistent and planned use of interactive media in several meetings provides better results than incidental or one-time use (Ginting et al., 2024). This shows that concept achievement is not only influenced by the media itself, but also by how and how often the media is used in learning.

Thus, it can be concluded that interactive media generally has a positive influence on elementary school students' achievement of science concepts. However, its effectiveness is greatly influenced by the type of media, method of implementation, student characteristics, and teacher

support. Therefore, the selection and use of interactive media must consider suitability to material needs and learning strategies in order to truly increase understanding of concepts optimally.

The Relationship between Scientific Attitude and Concept Achievement

Scientific attitudes and concept achievement in science learning have a close relationship and influence each other. A scientific attitude reflects students' mental and emotional readiness in undergoing a learning process that emphasizes observation, testing, and drawing conclusions based on evidence. When students have good scientific attitudes such as curiosity, openness to facts, and persistence in observing and investigating, they tend to be more active and involved in learning, which has a direct impact on deeper understanding of concepts (Demir, 2023).

Increasing scientific attitudes can encourage students to ask more questions, try and explore material independently. This is very important in science learning which emphasizes the scientific process. Students who have high curiosity, for example, will be more motivated to seek explanations for the phenomena they see in interactive learning media. This search and exploration process is the main entry point for students to build a strong conceptual understanding (Love, 2023).

In addition, scientific attitudes such as thoroughness and honesty in observing data and drawing conclusions are very important in avoiding conceptual misconceptions. Students who are accustomed to relying on evidence in learning will be more careful in distinguishing facts from opinions, and will be more critical of the information they receive (Abdjul et al., 2024). This will form a logical scientific way of thinking, which directly supports the achievement of accurate concepts.

Several studies show that there is a positive correlation between students' scientific attitudes and their cognitive learning outcomes, especially in science subjects. Students who have a better scientific attitude tend to get higher scores on tests of conceptual understanding. This shows that the process of internalizing a scientific attitude that is built through interactive learning experiences also substantially strengthens mastery of the material (Merazga, 2024).

However, the relationship between scientific attitudes and concept achievement is not linear or automatic. There are times when students show a good scientific attitude, but still have difficulty understanding certain concepts due to other factors such as basic abilities, teaching methods, or

complexity of the material (Mohamed, 2024). Therefore, it is important for teachers to not only encourage a scientific attitude, but also ensure that lessons provide adequate conceptual support.

Interactive media can act as a bridge that connects scientific attitudes with concept achievement. By providing learning experiences that allow students to experiment, predict, and analyze, this media facilitates both aspects simultaneously. Students who are interested in trying various simulations or digital explorations not only develop a scientific attitude, but also indirectly strengthen their understanding of concepts through these activities (Ali, 2024).

Thus, it can be concluded that improving scientific attitudes has great potential in supporting students' concept achievement, especially if facilitated with appropriate learning strategies and appropriate media. The integration between forming a scientific attitude and strengthening concepts not only improves students' cognitive learning outcomes, but also forms a scientific and systematic way of thinking from an early age.

The Impact of Using Interactive Media on Elementary Students' Scientific Attitudes in Science Learning

The use of interactive media in science learning in elementary schools has had a significant positive impact on the development of students' scientific attitudes. Through attractive visual displays and direct involvement in the learning process, interactive media is able to stimulate students' curiosity about natural phenomena. When students see animations of scientific events or run experimental simulations, they are encouraged to ask questions and find out more deeply, which is the main characteristic of a scientific attitude (Narawati et al., 2024).

Interactive media also creates learning experiences that encourage independent exploration and observation. This trains students to be careful and systematic in observing natural phenomena (Hayaty & Nandiyanto, 2022). For example, in the use of virtual laboratories or science educational games, students are asked to observe the results of changed variables and record the results, which directly fosters a thorough and observative attitude.

One important aspect of a scientific attitude that can be developed through interactive media is openness to evidence and a willingness to revise understanding based on data. When students perform simulations and find results that do not match their initial predictions, they learn to accept the facts and change their views based on empirical evidence. This attitude is very

important in forming scientific character from an early age (Lestari et al., 2023).

In addition, cooperation and responsibility also develop when interactive media is used in the form of group activities or collaborative projects. In a context like this, students learn to discuss, express opinions based on observations, and respect the opinions of friends. This strengthens scientific values such as team work, respect for data, and being open in solving problems together (Sulastri et al., 2024).

However, not all use of interactive media automatically results in strengthening scientific attitudes. If not designed well, media can actually become a distraction and make students focus more on the entertainment aspect rather than the scientific process (Desiyanti & Nugroho, 2024). Therefore, the teacher's role is very important in directing the use of media so that it remains focused on character development and scientific thinking processes.

The effectiveness of interactive media is also influenced by the suitability between the student's level of development and the media content. Media that is too complex or irrelevant can make students confused and lose interest. On the other hand, cognitively appropriate and visually attractive media can strengthen students' motivation to think and act scientifically in their learning process (Tristaningrat et al., 2024).

Overall, the impact of using interactive media on elementary school students' scientific attitudes in science learning is very promising. With the right approach, this media is able to create a learning atmosphere that is conducive to the growth of curiosity, objectivity, honesty, cooperation and perseverance, all of which are important parts of a scientific attitude. Therefore, the use of interactive media needs to continue to be developed and adapted to the objectives of science education at the elementary level.

CONCLUSION

Based on the results of the literature review, interactive media is proven to make a positive contribution to the development of elementary school students' scientific attitudes in science learning. The use of media such as simulations, animation and virtual laboratories can foster students' curiosity, accuracy, objectivity and critical attitude. Interactive media also creates an interesting learning environment and encourages active student participation, which is very important for cultivating character and a scientific mindset from an early age. However, its effectiveness is still influenced by the

suitability of the media to the students' age, teacher strategies, and learning context.

On the other hand, interactive media has also proven effective in increasing students' concept attainment. Students who are actively involved through interactive learning experiences tend to understand science concepts more deeply and meaningfully. Interactive media helps bridge understanding of abstract material through visualization and direct interaction. The relationship between scientific attitude and concept achievement is mutually reinforcing. Good scientific attitudes encourage in-depth exploration, while mastery of concepts strengthens understanding of the importance of the scientific approach in solving problems. Therefore, the use of interactive media is a learning strategy that has the potential to be widely applied in science learning in elementary schools.

REFERENCES

Abdjul, T., Odja, A. H., & Nurhayati. (2024). Effectiveness of Virtual Laboratory-Based Interactive Learning Media Through a Differentiated Approach to Students' Scientific Literacy. *Jurnal Penelitian Pendidikan IPA*, *10*(11), 9838–9838. https://doi.org/10.29303/jppipa.v10i11.9253

Akhtar, F. (2024). *Youth Attitudes Towards the Effects of Social Media Addiction: A Study on College Students in the United Arab Emirates*. *Query date: 2025-05-09 15:29:10*. https://doi.org/10.32388/5lw5by

Ali, D. G. (2024). A Comparative Study On Scientific Attitudes Of University Students. *Kurdish Studies*, *Query date: 2025-05-09 15:29:10*, 5052–5057. https://doi.org/10.53555/ks.v12i1.3115

Anggraini, W. N. (2023). Increase Interest in Learning Mathematics for 5th Grade Students Using Android Game-Based Learning Media. *International Journal of Elementary Education*, *7*(4), 637–645. https://doi.org/10.23887/ijee.v7i4.64937

Ariyani, S. M. & Nurdyansyah. (2024). The Effectiveness of Technology-Based Interactive Learning Media to Improve Students' Cognitive Skill at Islamic Elementary School. *JIP Jurnal Ilmiah PGMI*, *10*(1), 1–15. https://doi.org/10.19109/jip.v10i1.22575

Earley, M. A. (2014). A synthesis of the literature on research methods education. Teaching in Higher Education, 19(3), 242-253.

Banjarnahor, Y. D. M., & Tarigan, D. (2023). Nearpod-Based Interactive Learning Media in Improving Learning Outcomes of Class V Elementary School Students. *Indonesian Journal of Advanced Research*, *2*(6), 767–778. https://doi.org/10.55927/ijar.v2i6.4554

Beege, M. (2024). *The Emergence and Development of Attitudes of Students Towards the Use of Video-Based Media in Physical Education*. *Query date: 2025-05-09 15:29:10*. https://doi.org/10.2139/ssrn.4957886

Chen, K.-W., & Tsao, H.-Y. (2024). *ScholarOne—Dance Learning in Elementary Education: Interactive Media and Mirror Neurons*. *Query date: 2025-05-09 15:34:49*. https://doi.org/10.31124/advance.171267000.08204587/v1

Demir, Y. (2023). *Examining the Attitudes of Turkish Students Towards Scientific Field Trips*. *Query date: 2025-05-09 15:29:10*. https://doi.org/10.31219/osf.io/rpjfx

Desiyanti, V., & Nugroho, I. A. (2024). The Influence of the Problem Based Learning Model on the Scientific Attitudes and Science Learning Outcomes of Fifth Grade Elementary School Students. *Jurnal Penelitian Pendidikan IPA*, *10*(10), 8088–8097. https://doi.org/10.29303/jppipa.v10i10.8623

Dinia, N., & Setiyawati, E. (2024). *The Effect of Interactive Video Learning Media (PWZ) Changes in Forms and Subtances on Understanding Science Concepts for Elementary School Students*. *Query date: 2025-05-09 15:34:49*. https://doi.org/10.21070/ups.5370

Erdogdu, F., & Erdogdu, E. (2022). Understanding students' attitudes towards ICT. *Interactive Learning Environments*, *31*(10), 7467–7485. https://doi.org/10.1080/10494820.2022.2073455

Ginting, F. W., . W., Sakdiah, H., Novita, N., . S., & Damanik, A. K. (2024). Interactive Audio-Visual Learning Media Through Articulate Storylines Containing Problem-Based Contextual Learning to Improve Students' HOTS and Scientific Attitudes. *International Journal of Religion*, *5*(12), 1031–1044. https://doi.org/10.61707/z5c4xg78

Halimatusyadiah, H., & Disman, D. (2023). The Benefits of Interactive Media Websites Through Google Sites on Learning Outcomes of Elementary School Students. *Jurnal Lingua Idea*, *14*(1), 92–92. https://doi.org/10.20884/1.jli.2023.14.1.8305

Hayaty, W., & Nandiyanto, A. B. D. (2022). Using PowerPoint as a Learning Media for Elementary School Students about Personal and Environmental Health. *Open Global Scientific Journal*, *1*(1), 27–32. https://doi.org/10.70110/ogsj.v1i1.5

Higdon, N. (2022). The critical effect: Exploring the influence of critical media literacy pedagogy on college students' social media behaviors and attitudes. *Journal of Media Literacy Education*, *14*(1), 1–13. https://doi.org/10.23860/jmle-2022-14-1-1

Lestari, M. M. D., Margunayasa, I. G., & Diki. (2023). The Relationship of Coping Strategies, Self-Efficacy, and Scientific Attitudes towards Science Learning Outcomes of Fifth Grade Elementary School Students. *Jurnal Ilmiah Pendidikan Profesi Guru*, *6*(1), 82–93. https://doi.org/10.23887/jippg.v6i1.59271

Li, X. (2024). *Review of: "Youth Attitudes Towards the Effects of Social Media Addiction: A Study on College Students in the United Arab Emirates." Query date: 2025-05-09 15:29:10*. https://doi.org/10.32388/v2v76u

Love, T. S. (2023). Examining middle school students' attitudes toward computing after participating in a physical computing unit. *Interactive Learning Environments*, *32*(8), 3948–3967. https://doi.org/10.1080/10494820.2023.2194326

Malinda, J., Jalandri, I., & Agusanty, S. F. (2023). The Role of Education through Animation Media on Knowledge and Attitudes Towards Balanced Nutrition in Elementary School Students. *MEDICA (International Medical Scientific Journal)*, *5*(2). https://doi.org/10.53770/medica.v5i2.500

Merazga, S. (2024). Attitudes Of Algerian Students Towards Tiktok Influencer Videos:, A Field Study On Media And Communications Students At Batna 1 University□□, *Query date: 2025-05-09 15:29:10*, 235–235. https://doi.org/10.53284/2120-011-003-015

Mohamed, N. (2024). *"Assessment of Knowledge, Attitudes, and Misconceptions Regarding First Aid Management of Convulsions Among Neelain Medical Students: A Cross-Sectional Study" (Preprint)*. *Query date: 2025-05-09 15:29:10*. https://doi.org/10.2196/preprints.63056

Narawati, A. Y., Supriadi, D., & Mulyanto, R. (2024). Using Quizizz as an Interactive Learning Media to Improve Cognitive Values in Elementary School Students. *International Journal of Engineering, Science and Information Technology*, *5*(1). https://doi.org/10.52088/ijesty.v5i1.637

Ni'mah, N., Rahmawati, R., & Babo, R. (2023). The Effect of Interactive Media-Based Role-Playing on Elementary School Students' Social Attitudes and Learning Outcomes. *Pedagogik Journal of Islamic Elementary School*, *Query date: 2025-05-09 15:29:10*, 1–10. https://doi.org/10.24256/pijies.v6i1.3784

Ria, R. R., & Handayani, G. S. (2024). Literature Study: Effectiveness of Using Interactive Media "Google Earth" in Social Studies Learning for Elementary School Students. *International Journal of Educatio Elementaria and Psychologia*, *1*(2), 115–124. https://doi.org/10.70177/ijeep.v1i2.930

Salsabila, A., Misnah, Ratu, B., & Lukman. (2023). Utilization of Audio Visual Media in Developing Students' Critical Attitudes in History Learning at SMA LabschoolUntadPalu. *Journal of Scientific Research, Education, and Technology (JSRET)*, *2*(3), 957–963. https://doi.org/10.58526/jsret.v2i3.170

Sintarini, N. P. I., & Suniasih, N. W. (2024). The Impact of Predict-Observe-Explain Learning Model Assisted by Environmental Media on the Scientific Attitudes of Fifth Grade Elementary School Students. *Journal for Lesson and Learning Studies*, *7*(2), 374–381. https://doi.org/10.23887/jlls.v7i2.81873

Snyder, H. (2019¬). Literature review as a research methodology: An overview and guidelines. Journal of business research, 104, 333-339.

Sulastri, D., Andriana, E., & Syachruroji, A. (2024). Improving Elementary School Students' Science Literacy through Office Sway Interactive Learning Media. *EDUCARE: Journal of Primary Education*, 5(2), 165–180. https://doi.org/10.35719/educare.v5i2.306

Tirtoni, F. (2023). Pengembangan media smart board hybride learning version 2.0 berbasis primary education level interactive class untuk meningkatkan kemampuan communication and collaboration menghadapi era merdeka belajar. *COLLASE (Creative of Learning Students Elementary Education)*, 6(3), 395–400. https://doi.org/10.22460/collase.v6i3.17533

Toshpulatova, F. (2024). Interactive Teaching Methods In Distance Learning: Impact On Students' Scientific Activity. *American Journal of Philological Sciences*, 4(12), 36–41. https://doi.org/10.37547/ajps/volume04issue12-07

Tristaningrat, M. A. N., Suastra, I. W., Jampel, N., Margunayasa, I. G., & Sanjaya, D. B. (2024). The impact of the numbered head together learning model assisted by interactive media on elementary students' natural and social sciences learning outcomes. *Edelweiss Applied Science and Technology*, *8*(6), 9030–9039. https://doi.org/10.55214/25768484.v8i6.3932