Jurnal Studi Guru dan Pembelajaran, Vol. 7, No. 3, September – Desember 2024

Guided Inquiry Meets Audiovisual Media: Elevating Cognitive and Scientific Reasoning Skills

Nurul Kami Sani [1*], Muhammad Fachri B. Paloloang [2], Dyah Rahmawati [3], Nurul Fitriah Aras [4]

[1, 2, 3, 4] Universitas Tadulako, Indonesia

* nurulkamisani@gmail.com

Abstract

This study identifies the issues of insufficient effective teaching materials and minimal utilization of technology in education. Teaching models that do not involve student participation and the suboptimal use of educational media can hinder conceptual understanding and result in low cognitive learning outcomes and scientific reasoning skills among students. This study aims to explore the effectiveness of the Guided Inquiry model integrated with audiovisual media to enhance conceptual understanding and scientific reasoning in teaching static fluids. The research employs a pre-experimental method with a one-group pretest-posttest design, involving tenth-grade students from a senior high school in Palu during the 2023/2024 academic year. A cluster random sampling technique was used to select participants. Data collection was carried out using pretests and posttests to measure the improvement in both conceptual understanding and scientific reasoning. The results show an average normalized gain score of 0.59 for conceptual understanding, categorized as moderate, and 0.70 for scientific reasoning, categorized as high. Furthermore, a strong, significant correlation (r = 0.61) was found between conceptual understanding and scientific reasoning, indicating that the use of audiovisual media in guided inquiry enhances not only knowledge acquisition but also critical thinking skills. Therefore, this learning model is recommended for use in science education in schools to optimize students' cognitive and scientific reasoning skills. The findings of this research carry significant implications for the advancement of educational practices, particularly in the field of science learning. By highlighting key areas that require attention, the study provides insights that can inform curriculum design, teaching methodologies, and assessment strategies. This, in turn, can enhance student engagement and understanding, ultimately leading to more effective and meaningful learning experiences in science education.

Keywords: *Guided Inquiry, Audiovisual Media, Scientific Reasoning, Conceptual Understanding*

Introduction

Advancements in science and technology have brought significant changes to educational systems worldwide, intensifying competition in the field of education. Therefore, it is essential for teachers to understand and implement 21st-century learning paradigms that are crucial for the teaching and learning process (Ruhama et al., 2018). School environments require appropriate teaching materials to support effective teaching and learning activities. Teachers often utilize various teaching resources to enhance learning effectiveness. Technology, initially designed as a tool and resource for learning, is frequently underutilized in educational processes (Al Mamun et al., 2022). The implementation of learning models that do not involve student participation and engagement, along with the sub optimal use of educational media,

https://doi.org/10.30605/jsgp.7.3.2024.4655

can lead to difficulties in students' understanding of concepts. This, in turn, may result in weak cognitive learning outcomes and scientific reasoning skills among students (Hilmi, 2017).

Bloom suggests that learning outcomes can be categorized into distinct indicators: (1) Cognitive skills, which pertain to a student's ability to acquire and apply knowledge, (2) Affective skills, which are related to an individual's attitudes and emotional responses, and (3) Psychomotor skills. These indicators provide a comprehensive framework for evaluating the multifaceted nature of learning, encompassing both intellectual capabilities and personal development (Fuady, 2018). Science education in schools should emphasize the application of scientific concepts, principles, and relationships to everyday life. Observing, categorizing, comprehending, anticipating, making assumptions, identifying factors, managing, planning, implementing, and communicating are critical skills for science learning that need to be both acquired and continuously developed (Alifa et al., 2018). These competencies are foundational for effective scientific inquiry and understanding, enabling learners to engage deeply with scientific concepts, conduct rigorous investigations, and contribute meaningfully to scientific discourse. As such, fostering these skills is essential for preparing students to navigate complex scientific challenges and to promote a robust scientific literacy (Cahyono et al., 2021).. However, the continuous emphasis on rote memorization of concepts and procedural knowledge during the learning process has led to weak cognitive and scientific reasoning skills among students (Handayani et al., 2020). Scientific reasoning plays a crucial role in science education and should be a priority, especially in teaching that aims for deep understanding. Previous research has shown that scientific reasoning is closely related to learning outcomes, as it encompasses logical thinking, reasoning, rational thought, and decision-making (Khan et al., 2021). During the reasoning process, individuals typically relate the phenomena being studied to their prior knowledge, seek new knowledge, and refine and integrate their existing knowledge. According to Piaget's operational stages, scientific reasoning involves using scientific process skills to support conclusions in scientific research. This process includes the skills to relate observed phenomena to scientific theory to predict possible outcomes (Roviati et al., 2019). Appropriate models, strategies, media, or learning tools are needed to support the learning process, especially in science education, in order to achieve effective learning outcomes.

The guided inquiry learning model is a teaching approach that provides students with opportunities to learn gradually, starting from identifying problems, formulating hypotheses, developing questions, collecting data, verifying results, to drawing general conclusions, all of which require active student engagement in the classroom (Intan et al., 2022). Active student participation ensures that teachers do not deprive students of their right to learn independently (Handayani et al., 2020). The advantage of this learning model is that teachers can still monitor student activities, allowing those who think more slowly or have lower intelligence to keep up, while faster-thinking students do not dominate the activities. Students receive ample guidance and are prompted with numerous questions throughout the process (Rodriguez et al., 2020). The structure of the model comprises six key stages: introducing a problem, generating hypotheses, planning experiments, executing these experiments to gather information, collecting and analyzing the resulting data, and finally, drawing conclusions (Winarto et al., 2020).

The effectiveness of the guided inquiry learning model can be significantly enhanced when combined with audiovisual learning media. Teachers can utilize various learning tools such as audiovisual. Audiovisual learning media is one type of media that is increasingly popular in educational settings. This is because such media serve not only as instructional tools but also as valuable resources that aid students in the learning process (Probosari et al., 2016). Video-based learning media are extremely beneficial in both formal and non-formal educational settings. This is especially true for Generation Z, who were born during a time of advanced technology and thus are accustomed to learning styles that are highly visual and widely accessible (Nicolaou, 2021). Learning media are tools that help convey information or messages to learners. These tools are designed to communicate content effectively to the audience. Audiovisual media incorporate both sound and visuals, such as images and videos, tailored to align with the specific subject matter being taught (Suriawati et al., 2019). Utilizing audiovisual learning media can assist students in visualizing and better understanding various abstract concepts presented in the learning materials (Daryanti et al., 2015). When the appropriate learning media are applied, they enhance students' comprehension of each concept being taught, leading to improved learning outcomes (Asniar, 2016).

The implementation of suitable learning strategies and media is thought to enhance students' scientific literacy and abilitieoverall academic performance. Inquiry-based learning not only effectively captures students' interest but also significantly boosts their science process skills, leading to better learning outcomes (Nicolaou et al., 2019). Previous research has highlighted that the inquiry learning model can increase student motivation to learn (Micova, 2021). Additionally, other studies suggest that using interactive multimedia can support and improve student learning outcomes (Yulianti et al., 2020). The guided inquiry learning model, combined with audiovisual media, can positively impact student learning processes. Previous research has not specifically examined the effects of using the guided inquiry model supported by audiovisual media on the cognitive and scientific reasoning skills of third-grade elementary school students. This study aims to explore how this teaching approach influences students' physics learning outcomes and enhances their scientific reasoning skills.

Method

This study aims to investigate the effectiveness of implementing a guided inquiry learning model, assisted by audiovisual media, in improving students' conceptual understanding and scientific reasoning. This study employed a pre-experimental method designed to evaluate changes before and after an intervention. Specifically, this study utilized a one-group pretest-posttest design, where one class was randomly selected without using a control group, meaning all students in the same class participated in the research process.

The research process began with a pretest administered to assess students' initial understanding and scientific reasoning skills before the intervention. This pretest provided a clear picture of students' level of conceptual understanding and their ability to think scientifically. Following the pretest, the guided inquiry learning model, assisted by audiovisual media, was implemented over several sessions. This model was designed to encourage students to actively engage in the learning process, ask questions, and explore scientific concepts in greater depth.

The study concluded with a posttest to evaluate the improvement in students' understanding and scientific reasoning skills. This posttest not only assessed changes in academic scores but also provided insights into how well students could apply the concepts they had learned in relevant situations. This study not only focused on student learning outcomes but also on the processes that enabled such changes, making a significant contribution to the development of more effective teaching methods in the future.

Table 1. Research Design

Pretest	Action	Posttest
O_1O_2	X	O_1O_2

Description:

- **O_1**: Conceptual Understanding Test
- **O_2**: Scientific Reasoning Test
- **X** : Guided Inquiry Learning Model Assisted by Audiovisual Media

The population for this study consisted of all 10th-grade students in a high school in Palu City during the first semester of the 2014/2015 academic year, encompassing a total of four classes. To obtain a representative sample, the researcher employed a cluster random sampling technique to select a sample from this population. From the four existing classes, class XA was chosen as the sample, comprising 30 students.

This sampling method was designed to ensure that each class had an equal chance of being selected, thereby allowing the research findings to reflect the overall population. The researcher could minimize potential bias by randomly selecting one class that might arise from using other sampling methods. This technique also helped maintain fairness in sample selection, which is crucial in educational research where variability in students' understanding and skills can significantly impact the final research outcomes. Thus, the selection of class XA as the sample is expected to provide an accurate and reliable representation of the effectiveness of the teaching model implemented in this study.

The assessment instruments used for both the pretest and posttest consisted of multiple-choice questions with five options to measure the improvement in students' conceptual understanding, as well as essay-type questions evaluated with a scoring rubric to assess their multi-representation skills. The same set of questions was used in both the pretest and posttest to ensure that any observed improvements in conceptual understanding and scientific reasoning were genuinely the result of the treatment and not influenced by the assessment instrument itself. The items in the conceptual understanding test included indicators such as interpreting, comparing, concluding, and explaining. The items in the scientific reasoning test assessed proportional reasoning, control of variables, probability reasoning, correlation reasoning, and hypothetical-deductive reasoning.

Results

The implementation of the Guided Inquiry Learning Model enhanced by audio-visual media was monitored using structured observation tools by three trained observers. These observations aimed to assess the consistency of both teacher and student activities with the lesson plan. Each indicator of teaching and learning was scored based on its presence during the session, offering an objective measure of the model's adherence to the planned instructional sequence.

Results showed that the model was executed with 100% compliance by the teacher, who effectively guided the inquiry process. The teacher's thorough preparation, including careful review of the lesson plan, ensured smooth execution. The use of audio-visual media was instrumental in clarifying complex concepts and fostering student engagement. This integration of media provided students with visual and auditory stimuli that supported the conceptual understanding of abstract topics, thus enhancing cognitive retention. Furthermore, the teacher's skillful use of media ensured that it was not merely an auxiliary tool but a central part of the inquiry process, allowing students to make connections between theoretical knowledge and real-world applications.

Student participation, though initially uneven, improved progressively. The implementation rate of student activities increased from 77% in the first session to 88.8% in the second, and 93.6% in the third session, with an overall average of 86.3%. This suggests that students became more familiar with the inquiry-based approach over time, adjusting to the learning model's phases and actively engaging in the process. The gradual increase in participation can be attributed to the students' growing comfort with the structured phases of inquiry, which foster a deeper understanding of the content. The students became more confident in their roles as active learners, their ability to question, hypothesize, and test their ideas within the framework of guided inquiry strengthened.

The gradual rise in student engagement also highlights the importance of the teacher's role in scaffolding and adapting the model to student needs. The continuous feedback and encouragement from the teacher were crucial in bridging the gap between initial hesitance and eventual high participation. This evolving dynamic between the teacher and students underscores the value of formative assessment throughout the learning process, as it allows for real-time adjustments to teaching strategies and enhances student learning outcomes. The conclusion, the combination of a well-implemented Guided Inquiry Learning Model with the strategic use of audio-visual media not only improved the quality of student participation but also enriched the overall learning experience. This dual approach created an interactive and immersive environment where students were empowered to take ownership of their learning, fostering critical thinking, collaboration, and a deeper understanding of the subject matter.

Students' conceptual understanding of static fluids was assessed through an 18-item multiple-choice test, administered both before (pretest) and after (posttest) the implementation of the Learning Cycle 7E model using a scientific approach. The average pretest score was 38.33% of the ideal score, while the posttest average increased to 74.63%. The normalized gain score (N-Gain) was 0.59, which falls into the medium category according to Hake's classification (1999), indicating a moderate improvement in students' conceptual understanding after the intervention. This suggests that the Learning Cycle 7E model effectively enhances students' grasp of static fluid concepts.

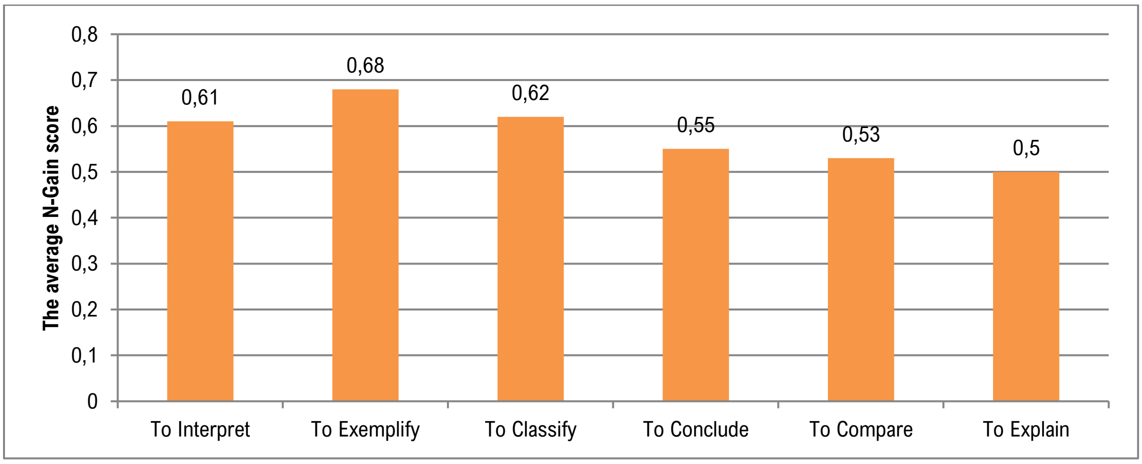

Figure 1. *Comparison Diagram of Average N-Gain Scores for Each Aspect of Conceptual Understanding*

Conceptual improvement across specific sub-concepts was analyzed through the test scores for individual items. These items measured six different aspects of conceptual understanding: interpreting, exemplifying, classifying, concluding, comparing, and explaining. Among these, the highest N-Gain was achieved in the exemplifying aspect (0.68), while the lowest was in explaining (0.50). According to Hake's scale, the N-Gain for all six indicators falls within the medium category, further supporting the conclusion that the model positively impacted students' conceptual understanding across all measured aspects.

Students' scientific reasoning skills were also assessed using a test adapted from Lawson's Classroom Test of Reasoning Skills (LCTSR), consisting of 24 multiple-choice questions. After translating the test into Indonesian, it was used to measure the impact of the Learning Cycle 7E model on reasoning skills. The pretest revealed a baseline average score of 20.28%, which increased significantly to 76.11% after the intervention. The N-Gain for reasoning skills was 0.7, placing the improvement in the high category, according to Hake's classification. This demonstrates that the Learning Cycle 7E model, combined with the scientific approach, is highly effective in enhancing students' scientific reasoning abilities.

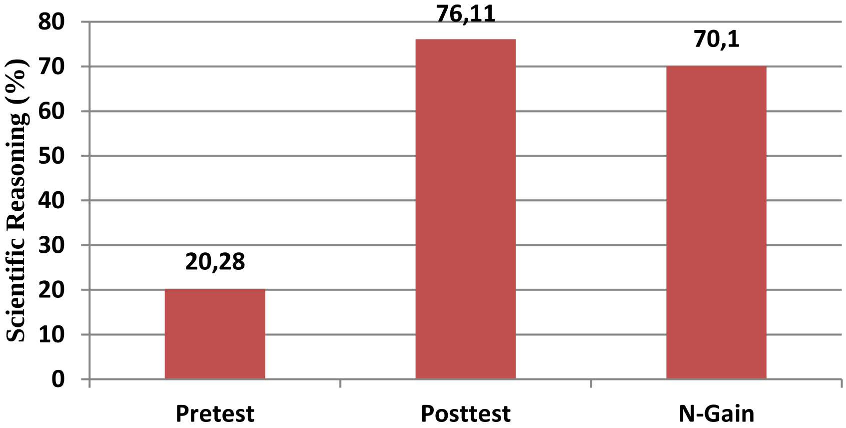

Figure 2. *Comparison Diagram of Average Scores for Pretest, Posttest, and N-Gain in Scientific Reasoning*

The findings of this study indicate that the application of the Learning Cycle 7E model not only promotes a significant improvement in students' conceptual understanding of static fluids but also substantially enhances their scientific reasoning skills. This improvement is clearly evident from the evaluation results, which show meaningful progress in how students understand and apply scientific concepts. The results of this research highlight the great potential of the Learning Cycle 7E model in creating a more interactive and in-depth learning environment, which in turn can facilitate better cognitive development in the context of science education. Thus, this model is not only effective in enhancing knowledge but also contributes to students' critical thinking skills, which are essential for facing scientific challenges in the future.

Discussion

The analysis of pretest data revealed that students' conceptual understanding of static fluids was significantly lacking, as evidenced by an average score of only 38.33%. This finding underscores the challenges faced by learners in grasping fundamental concepts, likely stemming from insufficient prior exposure during middle school. Following the implementation of the Guided Inquiry Learning Model, augmented by audiovisual support, a marked improvement was observed in the posttest scores, which averaged 74.63%. The normalized gain (N-Gain) score of 0.59 indicates a moderate enhancement in students' understanding, suggesting that the model effectively facilitated learning.

The model's success can be attributed to its emphasis on active participation, which encouraged students to engage in hands-on experiments and collaborative discussions. Such an interactive approach is vital for deepening students' comprehension of complex scientific concepts. Specifically, various aspects of conceptual understanding demonstrated notable improvements: interpretation (N-Gain: 0.61), exemplifying (N-Gain: 0.68), classifying (N-Gain: 0.62), concluding (N-Gain: 0.55), comparing (N-Gain: 0.53), and explaining (N-Gain: 0.50). Among these, the highest gain was observed in the exemplifying category, which is likely attributed to its direct application to real-world contexts, thereby enhancing relevance and retention. Students' scientific reasoning skills also exhibited substantial growth, indicating significant progress in the learning process. The average pretest score for scientific reasoning was only 20.28%, showing that before the implementation of the model, students were still struggling to understand basic concepts. However, after the model was applied, the posttest scores soared to 76.11%, demonstrating an extraordinary improvement and yielding an impressive N-Gain of 0.7, classified as high.

This growth is not only reflected in the overall scores but also in various specific dimensions of reasoning. For example, variable control reasoning showed an N-Gain of 0.71, indicating that students were increasingly able to identify and control variables in experiments. Probabilistic reasoning, with an N-Gain of 0.75, demonstrated an enhancement in students' abilities to make predictions based on uncertain data. Meanwhile, correlational reasoning, with an N-Gain of 0.67, signifies that students are becoming better at understanding the relationships between variables, and hypothetical-deductive reasoning, achieving an N-Gain of 0.62, indicates that students are capable of formulating and testing hypotheses more effectively. This significant improvement shows that the guided inquiry model not only strengthens students' conceptual knowledge but is also highly effective in developing the critical reasoning skills necessary for scientific inquiry. This emphasizes the importance of using active and directed learning approaches, which can facilitate students in developing the thinking skills required to tackle complex scientific challenges in the future.

The effectiveness of the Guided Inquiry Learning Model, particularly when supported by audiovisual aids, lies in its hands-on, inquiry-based approach. This strategy enables students to visualize complex concepts, fostering an active learning environment where they can construct knowledge through observation and experimentation. Research indicates that such active engagement not only sustains student interest but also significantly enhances retention and application of knowledge in new contexts (Handayani et al., 2020). Audiovisual tools played a crucial role in maintaining student focus and enriching the learning experience, as they provide visual representations of abstract concepts and facilitate a deeper understanding of experimental procedures.

Further strengthening these findings, a correlation analysis using Spearman's rank correlation coefficient revealed a strong relationship between students' conceptual understanding and their scientific reasoning skills, with a correlation coefficient of 0.62. This indicates a significant association between these two crucial aspects of the learning process, where improvements in conceptual understanding not only impact content mastery but also enhance students' critical and analytical thinking abilities.

This significant association underscores the interconnectedness of these two dimensions of learning, suggesting that improvements in one area can positively influence the other. Students with a better grasp of scientific concepts are more likely to apply this knowledge in situations that require scientific reasoning. Conversely, stronger scientific reasoning skills can aid students in analyzing and comprehending more complex concepts. These findings provide valuable insights for educators to design integrated curricula and teaching strategies that focus not only on concept mastery but also on the development of critical and analytical thinking skills. The students can achieve a deeper level of understanding by combining these two dimensions and be able to apply their knowledge in broader contexts, thereby preparing them for future scientific challenges.

The findings of the that Inquiry-based learning methodologies significantly enhance both conceptual understanding and scientific reasoning. Active learning approaches, such as guided inquiry, foster deeper engagement, critical thinking, and retention of knowledge, making them particularly effective in teaching complex subjects like physics. The implications of this study support the continued integration of innovative teaching strategies that promote inquiry-based learning, as they not only improve student outcomes but also cultivate a more profound interest in the sciences.

The inquiry process actively engages students in exploring knowledge, aligning with the findings of *Guided Inquiry Meets Audiovisual Media*. This study demonstrates that students can grasp the taught concepts more effectively and process information at a deeper level. The guided inquiry model provides students with opportunities to develop their scientific skills through observation, experimentation, and data analysis acquired during the learning process. Audiovisual media plays a significant role in bridging the gap between abstract concepts and real-world phenomena, helping to make stronger connections between theory and practice. This, in turn, reinforces the findings of *Guided Inquiry Meets Audiovisual Media* regarding the enhancement of students' scientific reasoning abilities (Alifa et al., 2018).

Conclusion

Based on the findings and data analysis regarding the implementation of the Guided Inquiry Learning Model assisted by audiovisual media to enhance students' conceptual understanding and scientific reasoning abilities, it can be concluded that there is a significant improvement in students' conceptual understanding of static fluids among tenth-grade high school students due to the application of the Guided Inquiry Learning Model assisted by audiovisual media. There is also a significant enhancement in the scientific reasoning skills of tenth-grade high school students in the context of static fluids, attributed to the application of the Guided Inquiry Learning Model assisted by audiovisual media. A strong relationship was found between scientific reasoning abilities and conceptual understanding in students who underwent treatment with the Guided Inquiry Learning Model assisted by audiovisual media, indicating a significant correlation between these two variables. Future research should consider a larger and more diverse sample size, including students from different grade levels and schools. This will help validate the effectiveness of the Guided Inquiry Learning Model assisted by audiovisual media across various educational contexts and student demographics.

Acknowledgment

-

References

Al Mamun, M. A., Lawrie, G., & Wright, T. (2022). Exploration of learner-content interactions and learning approaches: The role of guided inquiry in the self-directed online environments. *Computers & Education*, *178*, 104398. https://doi.org/10.1016/j.compedu.2021.104398

Alifa, T. F., Ramalis, T. R., & Purwana, U. (2018). Karakteristik tes penalaran ilmiah siswa SMA Materi Mekanika berdasarkan analisis tes teori respon butir. *Jurnal Inovasi dan Pembelajaran Fisika*, *5*(1), 80-89. https://doi.org/10.36706/jipf.v5i1.5774

Asniar, A. (2016). Profil penalaran ilmiah dan kemampuan berargumentasi mahasiswa sains dan non-sains. *Jurnal Penelitian dan Pembelajaran IPA*, *2*(1), 30-41. https://dx.doi.org/10.30870/jppi.v2i1.428

Cahyono, D. N., Khumaedi, M., & Hadromi, H. (2021). The impact of audio-visual media toward learning result in the subject of seizing picture. *Journal of Vocational and Career Education*, *6*(1). https://doi.org/10.15294/jvce.v6i1.32488

Daryanti, E. P., Rinanto, Y., & Dwiastuti, S. (2015). Peningkatan kemampuan penalaran ilmiah melalui model pembelajaran inkuiri terbimbing pada materi sistem pernapasan manusia. *Jurnal Pendidikan Matematika dan Sains*, *3*(2), 163-168. http://dx.doi.org/10.21831/jpms.v6i2.10948

Fuady, R., & Mutalib, A. A. (2018). Audio-visual media in learning. *Journal of K6 Education and Management*, *1*(2), 1-6. https://doi.org/10.11594/jk6em.01.02.01

Handayani, G. A., Windyariani, S., & Pauzi, R. Y. (2020). Profil Tingkat Penalaran Ilmiah Siswa Sekolah Menengah Atas Pada Materi Ekosistem:(Profile Of The Level Of Scientific Reasoning Of High School Student On Ecosystem Material). *Biodik*, *6*(2), 176-186. https://doi.org/10.22437/bio.v6i2.9411

Hilmi, A. F. (2017). Utilization of Audio Visual Media to Improve Student Learning Result in IPS Learning. *International Journal Pedagogy of Social Studies*, *2*(1), 88-103. https://doi.org/10.17509/ijposs.v2i1.8666

Intan, S., Yusuf, S. B., & Sari, D. F. (2022). A review on the use of audiovisual as media in improving listening skills among junior high school students. *English Education Journal*, *13*(2), 303-316. https://doi.org/10.24815/eej.v13i2.25932

Khan, S., & Krell, M. (2021). Patterns of scientific reasoning skills among pre-service science teachers: A latent class analysis. *Education Sciences*, *11*(10), 647. https://doi.org/10.3390/educsci11100647

Micova, S. B. (2021). The Audiovisual Media Services Directive. In *Research handbook on EU media law and policy* (pp. 264-281). Edward Elgar Publishing. https://doi.org/10.4337/9781786439338.00021

Nicolaou, C. (2021). Media trends and prospects in educational activities and techniques for online learning and teaching through television content: Technological and digital socio-cultural environment, generations, and audiovisual media communications in education. *Education Sciences*, *11*(11), 685. https://doi.org/10.3390/educsci11110685

Nicolaou, C., Matsiola, M., & Kalliris, G. (2019). Technology-enhanced learning and teaching methodologies through audiovisual media. *Education Sciences*, *9*(3), 196. https://doi.org/10.3390/educsci9030196

Nicolaou, C., Matsiola, M., Karypidou, C., Podara, A., Kotsakis, R., & Kalliris, G. (2021). Media studies, audiovisual media communications, and generations: The case of budding journalists in radio courses in Greece. *Journalism and Media*, *2*(2), 155-192. https://doi.org/10.3390/journalmedia2020010

Probosari, R. M., Ramli, M., Harlita, H., Indrowati, M., & Sajidan, S. (2016). Profil keterampilan argumentasi ilmiah mahasiswa pendidikan biologi FKIP UNS pada mata kuliah anatomi tumbuhan. *Bioedukasi: Jurnal Pendidikan Biologi*, *9*(1), 29-33. https://doi.org/10.20961/bioedukasi-uns.v9i1.3880

Rodriguez, J. M. G., Hunter, K. H., Scharlott, L. J., & Becker, N. M. (2020). A review of research on process oriented guided inquiry learning: Implications for research and practice. *Journal of chemical education*, *97*(10), 3506-3520. https://doi.org/10.1021/acs.jchemed.0c00355

Roviati, E., & Widodo, A. (2019). Kontribusi argumentasi ilmiah dalam pengembangan keterampilan berpikir kritis. *Titian Ilmu: Jurnal Ilmiah Multi Sciences*, *11*(2), 56-66. https://doi.org/10.30599/jti.v11i2.454

Ruhama, U., & Purwaningsih, D. I. (2018). Improving Students' Writing Skills through the Application of Synectic Model of Teaching Using Audiovisual Media. *English Language Teaching Educational Journal*, *1*(3), 176-190.

Suriawati, S., & Mundilarto, M. (2019). SETS approach-based audiovisual media for improving the students' critical thinking skills. *Psychology, Evaluation, and Technology in Educational Research*, *1*(2), 95-103. https://doi.org/10.33292/petier.v1i2.15

Winarto, W., Syahid, A., & Saguni, F. (2020). Effectiveness the use of audio visual media in teaching islamic religious education. *International journal of contemporary Islamic education*, *2*(1), 81-107. https://doi.org/10.24239/ijcied.Vol2.Iss1.14

Yulianti, E., & Zhafirah, N. N. (2020). Analisis komprehensif pada implementasi pembelajaran dengan model inkuiri terbimbing: aspek penalaran ilmiah. *Jurnal Penelitian Pendidikan IPA*, *6*(1), 125-130. https://doi.org/10.29303/jppipa.v6i1.341