THE NEED ANALYSIS FOR INTERACTIVE MULTIMEDIA BASED ON SCIENTIFIC LITERACY IN PRIMARY SCHOOL

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Abstract

The low science literacy of students in Indonesia is a challenge in education, especially at the elementary school level. Science literacy plays an important role in developing critical thinking skills, problem solving, and understanding of scientific and technological phenomena. However, PISA results show that Indonesian students' science literacy scores are below the international average. Factors that contribute to this condition include the lack of interesting learning media, the use of conventional methods, and the lack of technology integration in science learning. Therefore, this study aims to analyze the need for interactive learning media to improve the science literacy of elementary school students. The research method used was descriptive qualitative with data collection techniques through interviews and documentation studies. Interviews were conducted with teachers and students in Cigugur Sub-district, Pangandaran Regency, to understand their experiences, constraints and expectations of interactive learning media. The results showed that students are more interested in digital-based interactive media, such as video animation, educational games, and interactive simulations. Teachers also recognize that the use of digital media can improve students' understanding and motivation to learn, although they face constraints such as lack of training and access to adequate digital devices. These findings indicate the need for development and training in the use of digital media that is easily accessible and applicable in the classroom, to support the continuous improvement of science literacy at the primary school level.

Keywords: Science literacy; interactive learning media; digital learning; elementary school

Abstrak

Rendahnya literasi sains siswa di Indonesia menjadi tantangan dalam dunia pendidikan, terutama di tingkat Sekolah Dasar. Literasi sains berperan penting dalam mengembangkan keterampilan berpikir kritis, pemecahan masalah, serta pemahaman terhadap fenomena ilmiah dan teknologi. Namun, hasil PISA menunjukkan skor literasi sains siswa Indonesia di bawah rata-rata internasional. Faktor yang berkontribusi terhadap kondisi ini antara lain kurangnya media pembelajaran yang menarik, penggunaan metode konvensional, dan minimnya integrasi teknologi dalam pembelajaran sains. Oleh karena itu, penelitian ini bertujuan menganalisis kebutuhan media pembelajaran interaktif untuk meningkatkan literasi sains siswa Sekolah Dasar. Metode penelitian yang digunakan adalah deskriptif kualitatif dengan teknik pengumpulan data melalui wawancara dan studi dokumentasi. Wawancara dilakukan terhadap guru dan siswa di Kecamatan Cigugur, Kabupaten Pangandaran, untuk memahami pengalaman, kendala, dan harapan mereka terhadap media pembelajaran interaktif. Hasil penelitian menunjukkan bahwa siswa lebih tertarik dengan media interaktif berbasis digital, seperti animasi video, game edukasi, dan simulasi interaktif. Guru juga mengakui bahwa penggunaan media digital dapat meningkatkan pemahaman dan motivasi belajar siswa, meskipun mereka menghadapi kendala seperti kurangnya pelatihan dan akses terhadap perangkat digital yang memadai. Temuan ini mengindikasikan perlunya pengembangan dan pelatihan penggunaan media digital yang mudah diakses dan aplikatif di kelas, guna mendukung peningkatan literasi sains secara berkelanjutan di tingkat Sekolah Dasar.

Kata Kunci: Literasi sains; media pembelajaran interaktif; pembelajaran digital; sekolah dasar

Introduction

Science literacy is an essential competency for students at all levels of education, including elementary school. It includes four main domains: context, knowledge, competence, and attitude (Pratiwi et al., 2019). Today, students are not only recipients of information but are expected to manage, analyze, and utilize it wisely. Good science literacy enables students to think critically, solve problems, and understand natural and technological phenomena (Parisu, C. et al., 2025). It also contributes to better decision-making in addressing global issues such as climate change, health, and digital technology (Dianti, et al., 2023). Therefore, innovative and interactive learning strategies are needed to optimize science literacy. Educators should create learning environments that encourage exploration, experimentation, and evidence-based problem solving (Saputra, E. et al., 2024).

According to PISA (Program for International Student Assessment), scientific literacy is the ability to use scientific knowledge, identify questions, and draw evidence-based conclusions to understand the world and make decisions on scientific issues (Kristyowati & Purwanto, 2019). Afni, N., & Rokhimawan, M. A. (2018) added that according to the National Science Education Standards (NSES), science literacy includes knowledge and understanding of science concepts and processes to contribute to societal progress. It involves not only understanding concepts but also critical thinking, problem solving, and evidence-based decision making (Sanjiartha, I. et al., 2024). Thus, science literacy is the ability to use scientific knowledge to understand the world, make decisions, and contribute to society.

Indonesia currently faces challenges related to low literacy skills, including science literacy (Utami, et al., 2022). According to PISA reports, Indonesia's science literacy scores show little improvement over the years (OECD, 2021). The 2022 PISA assessment released by OECD (2023) shows that Indonesia's score remains below the international average. This indicates difficulties in understanding scientific concepts, applying scientific methods, and connecting them to real-world contexts. Contributing factors include conventional teaching methods, lack of engaging learning media, limited technology access, and insufficient teacher competence. To address these challenges, improvements should focus on curriculum development and the creation of innovative, student-centered learning resources. Integrating digital interactive media, such as animations, educational games, and simulations, can make learning more engaging and meaningful. These media help bridge the gap between abstract concepts and students' daily experiences, enhancing understanding and critical thinking. Therefore, developing interactive multimedia based on science literacy is crucial to support elementary students in mastering scientific knowledge and preparing for future challenges. The following table 1 compares Indonesia's science literacy scores from year to year taken from the OECD report:

Table 1. Indonesia's science literacy score

Year	Indonesia's Science Literacy Score	Rating
1	393	38/41
2	395	38/41
3	393	50/57
4	383	57/65
5	382	64/65
6	403	62/72
7	396	70/78
8	383	67/81

In comparison, the average global science literacy score in PISA 2022 is 485 points. Seeing Indonesia's score below the average confirms that the achievement in understanding and applying science concepts in Indonesia is still far behind compared to other countries. Indonesia is far below the PISA average and below other developed and developing countries, Indonesia is only able to surpass the neighboring country of the Philippines, following figure 1 graph of science literacy scores based on PISA 2022 results:
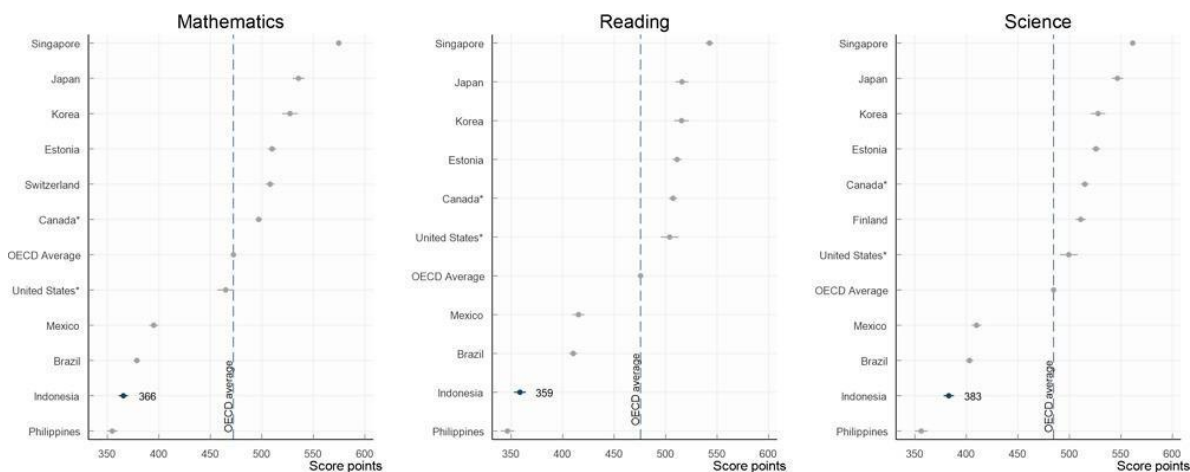
Figure 1. PISA Literacy Score Chart 2022

Source (OECD, 2023).

Low science literacy in Indonesia is attributed to factors involving students, teachers, and schools (Yusmar & Fadilah, 2023). Students struggle with abstract science materials due to conventional teaching methods and low interpretation skills. Teachers often rely on textbooks, which are ineffective for complex science topics (Fuadi et al., 2020), and limited training prevents the use of inquiry-based methods and experiments. Additionally, the lack of laboratories and teaching aids hinders the comprehension of scientific concepts. With technological advancements, interactive learning media has become a vital solution to improve learning outcomes, particularly in enhancing science literacy in elementary schools. Interactive learning media, such as apps, simulations, and educational games, facilitate two-way interaction between students and content, boosting engagement, motivation, and understanding of science (Faturrokhman, 2024; Melati et al., 2023). This approach aligns with 21st-century learning, which prioritizes critical thinking, creativity, communication, and collaboration skills.

Previous research (Juniati et al., 2020) showed that multimedia learning significantly improved students' science literacy. The N-Gain test results of 77.5% in the experimental class demonstrated the effectiveness of multimedia-based learning in visualizing abstract concepts. Safira and Nahdi (2024) emphasized that interactive media, such as animations and simulations, enhance student understanding, while gamification through platforms like Quizizz and Wordwall increases learning motivation (Sholeh, 2025). Sukma and Handayani (2022) also found that using Wordwall quizzes positively impacted science learning outcomes. However, the adoption of interactive media in Indonesian primary schools remains limited (Rahma et al., 2023) due to restricted access to technology and low teacher proficiency. Interviews with teachers in Cigugur sub-district, Pangandaran, revealed that while schools have digital devices, teachers still rely on textbooks due to a lack of technological skills.

This research offers novelty by analyzing the contextual needs of both students and teachers, which are often overlooked in prior studies that mostly center on media outcomes.

The results are expected to provide recommendations for developers, educators, and policy makers to improve the quality of science learning in elementary schools. By understanding these needs, it is expected to create learning media that are more interactive, contextual, and in accordance with the characteristics of elementary school students. Rather than a general call for digital transformation, this study serves as an evidence-based entry point for rethinking how digital media can be designed and implemented to suit specific educational environments. It contrasts with earlier work by shifting the focus from measuring effectiveness to identifying implementation readiness and design alignment. The development of innovative digital-based learning media will make it easier for students to understand abstract science concepts. Student involvement in the learning process is also expected to increase through the use of interesting and accessible media. Teachers will get alternative media that are suitable for the situation and conditions at school. That way, students' science literacy can increase gradually and sustainably. To achieve these goals, the research employed a qualitative descriptive approach, which is detailed in the following methodology section.

Research Methods

This study used a descriptive qualitative approach, with research subjects consisting of 5 elementary school teachers and 5 students from schools in the Cigugur District, Pangandaran Regency. Data collection techniques employed in this study included interviews and documentation studies, which aimed to obtain an in-depth description of the use of interactive learning media in improving students' science literacy.

Interviews were conducted with 5 teachers and 5 students, each lasting approximately 30-45 minutes. The interviews were designed to reveal the participants' experiences with interactive learning media, challenges encountered in implementing the media, its effectiveness in improving science understanding, and their expectations for the development of more innovative media suited to elementary school learning.

Secondary data collection was carried out through document analysis, including curriculum documents, learning modules, and previous research relevant to science literacy in the digital era. This study aimed to understand the educational policies in place as well as trends in the development of interactive learning media.

Data were analyzed descriptively using the Miles & Huberman model: data reduction, data presentation, and conclusion drawing. This approach is expected to provide insights into the effectiveness of interactive learning media, identify challenges, and offer recommendations for media developers, teachers, and policymakers to support technology-based learning.

To ensure the validity of the data, triangulation was used by comparing the data collected from interviews, documentation studies, and previous research. Additionally, member checking was conducted by returning the interview transcripts to participants for review and confirmation of the accuracy of the information provided. This helped to ensure the reliability and credibility of the findings.

Result and Discussion

To get an overview of the needs of science literacy-based learning media in elementary schools, researchers conducted a preliminary study through interviews with several teachers and students. This interview aims to identify the needs, constraints, and potential in developing learning media that can improve students' science literacy. The following is table 2 of the results of interviews conducted by researchers:

Table 2. Researcher interview results

No.	Indicator	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Teacher 5
				Answer		
1	Teacher Background	He is a driving and practical teacher and has been teaching for 17 years.	He isa driving and practical teacher and has been teaching for 15 years.	He isa driving and practical teacher and has been teaching for 15 years.	She graduated from science education and teaches at an elementary school and has been teaching for 15 years.	Taught in elementary school for 5 years.
2	Student characteris tics in learning (solar system material)	Low, only knows the names and order of the planets	Low, only partially memorized knowledge.	In the process of getting better	Good enough, understand rotation, revolution, eclipse	Only knows the names of planets, rotation, and revolution
		It is difficult to apply and contextual ize the knowledge gained.	It is very difficult to memorize and understand because there are too many science materials	No significant difficulties, enthusiastic about digital media	Often confused between revolution and rotation	Difficulty understandi ng abstract material
3	Media use and effectiveness	KIT, Globe, and flashlight	Real objects and digital media	Tablets, cell phones, laptops, LEDs, YouTube videos, and 2 dimensional images	Video, globe, flashlight book.	Video, pictures, ball, posters, globe, flashlight
		Multiple lessons are needed to measure effectivene ss	Very effective but it goes back to the diverse learning abilities of children.	Effective with a variety of media	Quite effective compared to no media	Effective, students understand more than just hearing the teacher's story
	Science literacy	Critical to meeting future challenges	It's important for their future endeavors.	It is important that students understand the benefits of learning	Very importantly, students must understand and apply	Very important because solar system material must be mastered by students

No	Aspect					
4	skills	Low, they are only years on the surface.	Very low, due to low reading ability.	Still low compared to other subjects	Low, especially for abstract material	Less, students only know the basics without application
5	Media Preferences	Interactive media that students can explore	Game-based digital media.	Media is diverse, interesting, and systematic	Varied media with explanations, videos, and games	Interesting media with full explanation s, videos, and games
		Click planets for details, simulation videos, quizzes	Click planets for details, simulation videos, quizzes	Attractive images, audio, games, simulations, experiments	Simulation video, student interaction in simulation	Full digital- based features: games, videos, interesting pictures
6	Obstacles & Support	It's hard to concentrat e because I'm more Interested in social media	There are no significant obstacles if teachers are willing to try	No significant obstacles	Limited learning resources, there are only books	Internet is only available in the office and classrooms near the office
		Supportive,s chool has digital equipment	Supportive, school has digital equipment	Supportive, school has digital media	Support, students have Android phones	Supportive, internet, tablet, infocus, laptop available at school
7	Expectations & Suggestions in media development	Effective and contextual ized media	Media that can improve student learning outcomes and contextualiz ation	Improve students' science understandi ng and literacy	Media attracts students' attention and reduces boredom	Innovative media that students love
		Use interactive platforms with engaging features such as power point or Giga Hub.	Use canva or livesheet.	Use platforms like YouTube, Google Chrome, TikTok	Use Canva for presentation, Google Form evaluation	Media should be interesting, innovative, increase literacy and student motivation

Based on the interview data presented in the table, it can be concluded that teachers are highly aware of the importance of science literacy, yet its implementation still faces multiple challenges. One key finding is that students struggle to understand abstract concepts such as rotation and revolution, which highlights the need for media that can effectively visualize scientific ideas. Although some teachers have begun using media such as videos, posters, and

globes, the use of interactive digital media remains limited due to constraints in technological competence and school infrastructure. These findings emphasize that, while prior studies have examined the effectiveness of multimedia in science learning (Juniati et al., 2020), few have focused on the specific needs and constraints of teachers and students in the development of science literacy-based media at the elementary school level. This study fills that gap by adopting a needs-based approach that captures contextual realities in classrooms. The phrase "first step in digital transformation" refers to the initial yet crucial shift from traditional textbook-based instruction to media-supported, interactive learning an area that has not been systematically explored in the context of Indonesian primary education. By identifying both barriers and potential supports, this study offers practical recommendations for designing digital media that are interactive, contextualized, and aligned with students' learning characteristics. It is expected that such media can enhance not only student engagement and conceptual understanding but also support teachers in delivering science content more effectively.

They generally only memorize the names and order of the planets, while only a few understand abstract concepts such as rotation and revolution. This condition shows the challenges in delivering abstract material to students, especially those with limited science literacy. This is in line with Yusmar and Fadilah (2023) who state that low science literacy is caused by learner, teacher and school factors. In terms of students, the causes include low understanding of the material, conventional learning methods, lack of ability to interpret teaching materials, and low literacy in general. From the teacher's side, one of the causes is a mistake in choosing learning resources. Teachers have used various learning media such as KIT, globe, digital media and video. However, the effectiveness of these media depends on students' diverse abilities. Digital media is more attractive to students, but not all students can access and utilize it optimally. According to Prastya (2016), in choosing learning media, teachers need to consider school conditions, student characteristics, and ensure the technical quality of the media so that it is effectively used as a learning tool. In addition, Santosa et al. (2024) emphasized that the use of innovative digital media is one of the important strategies to improve students' science literacy. In general, students' science literacy skills are still low. They tend to understand the material superficially without being able to apply it in a real context. Difficulty in reading and understanding abstract concepts are the main challenges, so a more in-depth and project-based learning strategy is needed, following table 3 of the results of interviews with students:

Table 3. Student interview results

No.	Indicator	Answer				
		Student 1	Student 2	Student 3	Student 4	Student 5
1	Learning Experience	It's fun because you can learn a lot about materials related to the environment.	It's a lot of fun.	Easy but sometimes difficult to understand. Fun because they often use interesting media.	It's average, sometimes fun, sometimes boring.	It's fun to learn about nature.

2	Material Comprehen sion	It's hard to learn about and live in space.	Everything is difficult, especially those that cannot be seen directly.	Often confused between revolution and rotation.	It is rare to learn science because teachers often teach math or Indonesian.	It is difficult to memorize the names of the planets.
3	Media Usage	Never used a panel plate. I liked it because I could see the phenomenon in real time.	Never used paper or tablet drawings. Fun and encouraging to learn.	Have used YouTube, Google, planetary images. Pretty good and liked.	Have used cell phones, videos, pictures. Favored.	Never used a laptop or cell phone. Fun.
4	Media Preferences	Media with video animations, interesting games, and presented in large media such as panel plates.	Media with videos, quizzes and interactive questions.	Game media that can be used on mobile phones and laptops.	Prefer hands-on practice.	Media with quizzes, questions, and engaging images.
5	Learning Barriers	Difficult t o understand deep material	Difficulty memorizing the planets because there are many of them.	There are some materials that are difficult to understand	The material is very difficult to understand.	The names of planets are often confused.
6	Expectation s of the Media	Media that can provide a more real-life experience.	Media that makes learning more fun.	Learning games that can be accessed on mobile phones.	3D animation, audio, clear images, and clear material descriptions.	Media that can make learning fun and facilitate memorizati on.

From the interview results, it can be seen that most students showed a positive response to the learning experience of materials related to the natural environment. They find learning enjoyable, especially when the media used is interesting and relevant. However, there were variations in the learning experience, where some students felt bored due to the lack of varied delivery methods. This shows the importance of implementing interactive and fun learning approaches to maintain students' interest and facilitate a deeper understanding of the material.

Students' level of understanding of the material shows that abstract concepts, such as life in outer space, revolution, and rotation of the earth, are still difficult for students to understand. This can be caused by limitations in delivering the material concretely and the lack of direct experience. In addition, some students experience problems in understanding because they rarely get adequate learning, especially when teachers focus more on other subjects. From the interviews, it is also known that the majority of students have used various learning media, such

as panel plates, tablets, pictures, and other digital devices. The use of digital media such as YouTube and Google is considered quite helpful in increasing students' learning motivation (Rasman, R. 2021). However, the effectiveness of using these media does not seem to be optimal in improving students' conceptual understanding. This indicates that learning media needs to be designed more contextually, integratively, and tailored to students' learning characteristics.

Meanwhile, students' media preferences tend to lead to interactive media such as video animation, educational games, and interactive simulations. This indicates that students are more interested in media that can be accessed through digital devices and have interesting game elements (Wildan, A., et al., 2023). Interactivity in learning media is proven to increase learning motivation and help students understand abstract concepts in science (Nurhasanah, N., et al., 2024). In addition, a preference for hands-on practice also emerged, indicating the need for applicable and concrete learning experiences, especially in science learning that requires exploration through experiments or hands-on activities (Hermawan, N., & Nurpalah, E. 2025). Therefore, the utilization of digital-based interactive media needs to be combined with hands on practice to improve students' conceptual understanding as well as critical thinking and problem-solving skills.

Most students experience barriers in understanding abstract material such as the solar system and tend to memorize factual information such as planet names. This difficulty points to the need for a more contextualized and experiential learning approach. Visualization technology such as 3D animation or interactive simulation is a potential solution. Students also expect learning media that are more concrete, fun, and facilitate real learning experiences. In line with Alwan (2018), suggested media include digital educational games, 3D animations, engaging audio-visuals, and interactive quizzes, which are not only informative, but also increase students' motivation and conceptual understanding.

Literature analysis shows that the use of multimedia in solar system learning in elementary school is still limited, especially in integrating science literacy domains (content, context, skills, and attitudes). Existing multimedia generally only conveys basic concepts and increases learning motivation, but does not support the development of scientific, analytical and critical thinking skills. Aspects of context and scientific attitudes are also still often ignored, so the results of the literature study become support for reference. The following table 4 shows the results of the literature study from 10 articles:

Table 4. Literature Study Results

No	Article and Journal Identity	Results of Analysis of Developed Media
1	Ningtiyas, E. S., WENDA, D. D. N., & WIGUNA, F. A. (2024). Pengembangan Multimedia Interaktif Sitaya (Sistem Tata Surya) Untuk Siswa Kelas 6 Di Sdn Kraton Kabupaten Kediri. *EDUTECH: Jurnal Inovasi Pendidikan Berbantuan Teknologi*, *4*(1), 46-59.	This interactive multimedia was developed as a response to the lack of learning resources available in one of the elementary schools in Kediri Regency. This multimedia is named SITAYA (Solar System) developed with the ADDIE Method, this multimedia contains visulisation and explanation of the planets with audio inserted so that students are more interested in exploring this media. The four elements of science literacy have not been seen explicitly in this multimedia. The results of teacher and student responses to this media are considered very practical with a percentage of 90%.
2	Agustina, S. Y., & Aziz, R. A. (2024). Perancangan Media pembelajaran Interaktif Pengenalan Sistem Tata Surya Untuk Siswa Sekolah Dasar. *Repeater:*	This multimedia was developed with the main purpose to attract students' interest in learning. This multimedia development uses the ADDIE model, the software used in making this media is adobe animate, this multimedia contains illustrations and brief

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explanations of celestial bodies and palanets, besides that this multimedia is also equipped with games. The four domains of science literacy have not been explicitly seen in the development of this multimedia.

3   Ariani, Q. (2024). Sistem Tata Surya Sebagai Media Pembelajaran Untuk Siswa Kelas VI di SD Swasta Amir Hamzah. In *Prosiding Seminar Nasional Multi Disiplin Ilmu (SENADIMU)* (Vol. 1, No. 1, pp. 377-389).

This multimedia was developed with the main purpose of increasing students' interest and understanding of learning. Developed using the Waterfall method, this multimedia uses Adobe Flash CS6 software. The results of this media design are considered very valid by students. This multimedia consists of Basic Competency features, Instructions for Use, material explanations, videos, and Quizzes. The literacy domains of content, context, skills, and attitudes are not explicitly visible in this multimedia.

4   Marsya, A., & Tamam, B. (2023). Pengembangan Multimedia Interaktif Â€ Œayo Belajar Bimasaktiâ€ Berbasis Android Pada Materi Sistem Tata Surya. *LENSA (Lentera Sains): Jurnal Pendidikan IPA, 13*(1), 1-10.

This multimedia was developed for use at the junior high school level. This media development uses the ADDIE model, using Construct 2 software and Website 2 APK Builder to produce android applications. Elements of increasing science literacy are seen in this application, where the four domains of science literacy are explicitly visible. The content domain, seen in the let's read feature, the skills domain is seen in the let's observe menu, the context domain is seen from the Did You Know feature, and the attitude domain is seen from the let's discuss feature. The disadvantage of this multimedia is the absence of evaluation features or games at the end of learning. Based on the results of student responses, this media is very good with a percentage of 89%.

5   Aulia, W. (2023). Pengembangan media pembelajaran berbasis multimedia interaktif materi tata surya kelas VI sekolah dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar, 11*(1), 220-234.

This multimedia was developed with the RnD model and received a positive response from grade VI students. Based on the validation test results of media experts and material experts, this interactive media is very valid with a value of 96.67% and 95%. While student responses show this media is very practical with a percentage of 94.63%. If analyzed in terms of the science literacy domain, this media does not explicitly show all domains of science literacy in it. The features in this media are material, evaluation, karoke, and concept map.

6   Saskia, R. A., Ajizah, A., & Hafizah, E. (2022). Pengembangan Media Pembelajaran Interaktif Articulate Storyline pada Materi Sistem Tata Surya untuk Kelas VII SMP/MTs. *Indonesian Journal of Science Education and Applied Science, 2*(2), 17-28.

This interactive media was developed on the basis of the lack of media and learning resources for solar system material in junior high school. This development uses the RnD method with the 4D model. This media creation uses Articulate storyline software, the features in it are in the form of material explanations that begin with a lighter question. Based on the results of student responses, this media is practical with a presentation of 88%. When viewed from the elements of sians literacy, this media has not integrated the 4 elements of sians literacy explicitly.

7   Putra, W. P., & Negara, I. G. A. O. (2021). Pengembangan multimedia sistem tata surya pada muatan ipa. *Mimbar Ilmu, 26*(1), 108-117.

The low interest in student learning and the lack of learning resources in one of the elementary schools is one of the reasons for developing this multimedia. The creation of this media uses the help of Adobe Flash CS6 software. This media development uses the ADDIE model. The resulting multimedia contains learning objectives, materials, and evaluation features. Based on the

8	Ardiyanti, W., & Zuhdi, U. (2021). Pengembangan multimedia interaktif pembelajaran berbasis android pada mata pelajaran IPA materi tata surya untuk kelas VI sekolah dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, *9*(3), 1968-1980.	results of expert validation of this media material is valid 87.50 (very good), while media expert validation 91.66 (very good). The four domains of science literacy are not explicitly visible in this media. This multimedia was developed as one of the learning needs carried out online during the Covid-19 pandemic. This multimedia development uses the Research and Development (R&D) method. This development produces a smartphone application for solar system learning. The features contained in it consist of instructions for use, KD & Indicators, learning objectives, material, quizzes and developer profiles. This media is considered valid with a score of 86% from media experts, and 97.9% from material experts. This media is also considered feasible by students of 97.9%, and 92% of the teacher's assessment which means this media is very feasible. In addition, this media is also able to improve student learning outcomes of 83.9%. posttest>pretest which is 83.1>58.75. When viewed from the science literacy domain, the domain is not explicitly visible in the multimedia developed.
9	Nugraha, B. S., & Hidayat, I. (2019). Implementasi Media Pembelajaran Interaktif "Sistem Tata Surya" Untuk Kelas VI Sekolah Dasar. *INFOS Journal-Information System Journal*, *1*(3), 1-6.	This interactive multimedia was developed based on concerns about the lack of learning media used by teachers in learning the solar system. This multimedia was developed using CorelDRAW Graphic Suite X7 software, Adobe Photoshop CC 2015, and Adobe After Effects CC 2015 software to produce a solar system learning mobile application. It contains illustrations of the planets along with a brief explanation of the planets. In this application, the science literacy domain is still not seen explicitly and deeply.
10	Astuti, I. A., Harwanto, A., & Hidayat, T. (2019). Pengembangan Media Interaktif Pengenalan Sistem Tata Surya Menggunakan Framework MDLC. *Jurnal Eksplora Informatika*, *8*(2), 158-166.	This multimedia was developed to increase student participation in teaching and learning activities. This multimedia development uses the MDLC (Multimedia Development Life Cycle) model. The creation of this media uses the help of CorelDraw X7, Adobe Audition CS6, and Adobe Flash CS6 software. The result of the development is an application that consists of several learning features, namely solar system material and quizzes. Based on the results of the trial use of this multimedia can improve student learning outcomes 22.27% through the Quasi experimental method. In terms of science literacy, this multimedia does not explicitly show the domain of science literacy in its content.

Based on the results of the research analysis above, it shows that multimedia in solar system learning in elementary schools has not fully integrated the four domains of science literacy. Most focus on content, while context, skills and attitudes are less accommodated. Students' low science literacy is also influenced by limited learning resources, where teachers tend to rely only on pictures in books (Fuadi et al., 2020), so learning is less varied and less supportive of science literacy as a whole.

Conclusion

The results showed that the low science literacy of elementary school students is caused by the lack of utilization of innovative and interactive learning media, as well as conventional teaching methods. Based on the review of articles and interviews in the field, there is no multimedia developed with reference to aspects of science literacy as a whole, while teachers and students need such media to support more effective learning. Students are more interested in interactive digital media, such as video animations, educational games, and simulations, which can increase motivation and understanding of science concepts. However, the application of this media still faces obstacles, especially in teachers' skills in using technology and limited access to digital facilities. Therefore, it is necessary to develop science literacy-based multimedia that is not only digital but also oriented towards science literacy so that students' understanding is more in-depth and contextual. This study serves as a foundation for developing science literacy-based learning models, offering insights into the challenges and preferences of students and teachers, which can guide the design of more effective learning media. In addition, training for teachers in the use of learning technology needs to be improved so that the implementation of digital media is more optimal. Future research can focus on developing and testing science literacy-based interactive multimedia and analyzing its effectiveness in improving the science literacy of elementary school students in a sustainable manner.

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