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EFFECTIVENESS OF PHYSICS INTERACTIVE LEARNING MEDIA IN IMPROVING LEARNERS'S SCIENCE LITERACY SKILLS: SYSTEMATIC LITERATURE

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Abstract :
This study reviews the literature in an effort to determine how well students' science literacy can be raised by utilizing interactive learning resources for physics. Understanding scientific ideas, using science knowledge in daily situations, and analyzing and resolving science-related issues are all components of science literacy. This study has identified and analyzed a variety of interactive learning media, including interactive magazines, interactive kinematics learning applications, interactive electronic learner worksheet based on LiveWorksheets, Higher Order Thingking Skill-based interactive modules, and learning videos based on the 5E learning cycle model. The study's findings show that interactive learning media can be a very useful tool for teaching physics, but its effectiveness depends largely on how well it is implemented, how well the design of the instruction is done, and how well the learning environment supports the student.

Keywords: Interactive Learning Media, Physics Learning, Science Literacy

INTRODUCTION

The 4.0 revolution era is characterized by the speed and sophistication of technological advancement. Global competition is witnessed in the ongoing emergence of new technologies. Technology is incredibly useful for human endeavors and activities. Nearly every element of modern life, including education, depends on technology. Technology is developing at a very fast rate, so people need to prepare their human resources with the different 21st century skills that are required today.

A 21st century skill set is necessary for every citizen to keep up with the rapid advancement of a globalized society. Education is one way to acquire these skills. In educational units, HR begins with the students. In terms of knowledge, skills, attitudes, and superior values, the ability to develop 21st century learning skills is still being prepared (Asrizal, A., et al, 2018). The process of learning can incorporate these abilities. Science literacy is one of the 21st century skills, according to a 2015 report by the World Economic Forum (Wefusa). In order to prepare students for life in the age of globalization, schools can help them develop their scientific literacy (Arifin, L., & Sunarti, T, 2017).

In order to solve meaningful scientific problems or overcome personal obstacles while learning, science literacy is crucial for the development of appropriate scientific knowledge and skills that are based on facts that are creatively relevant in daily life (Soobard, R., & Rannikmae, M, 2011). The ability

to choose facts from events that society can use to adjust to a world that is changing quickly is known as science literacy. When combined with critical thinking abilities, science literacy will allow an individual to apply their knowledge to enhance their quality of life. Science literacy assessment centers on the competencies of learners that must be understood and performed in individual, social, and global contexts. The ability to apply scientific understanding to real life involving science is what makes science literacy important.

Program for International Student Assessment commonly abbreviated as PISA (2010) states that science literacy is made up of three parts: context (science application), process (science competence), and content (science knowledge). The fundamental ideas required to comprehend both natural phenomena and alterations in the environment brought about by human activity are referred to as science content. In this instance, PISA typically restricts the range of science content to that which is covered in the science curriculum in schools, though it also encompasses information that can be found elsewhere. The term "science process" describes the procedures students follow when responding to inquiries or resolving issues, like assessing and clarifying corroborating information and drawing conclusions. This includes knowing what can be used in a scientific investigation, recognizing conclusions that make sense in light of the data, and determining the kinds of questions that science can and cannot answer. The daily conditions that surround us serve as a reference point for applying our comprehension of scientific concepts to real-world situations.

Using learning media in the classroom is essential to helping students become more science literate. In order to support the efficacy of the learning process, learning media must be used as both a crucial component of educational technology and a part of learning resources. Because of the speed at which technology is developing, students today need to be more proficient in information and communication technology. Learning objectives can be successfully met with the help of learning media that is used to its fullest potential and in compliance with competency requirements. Interactive learning media are thus the type of educational resources that can help with this.

Interactive media is any kind of media that combines text, images, sound, animation, and video in order to make the information easier to understand when it is delivered. Enhancing the quality of education and students' learning potential can be achieved with interactive learning materials that are beautifully packaged (Akbarini et al., 2018). Because interactive learning materials must pique students' curiosity and make learning engaging, especially in subjects like physics, which is closely related to everyday life, they can make learning engaging and not monotonous. Thus, it may be simpler for students to see physics events in real life when using interactive learning materials that include videos. Learning physics is guided by methodically learning about nature; therefore, mastering physics is not only about knowing facts, concepts, or principles; it's also about embarking on a journey of discovery and molding students' attitudes toward literacy.

The ideal conditions of today differ significantly from the expected conditions and are not at all like what actually occurs in the field. Similar to the 2018 Programe for International Students Assessment (PISA) study results, which focused on the theme of science competence, science literacy levels in Indonesia remain comparatively low. Indonesia's ranking of 74th out of 79 countries with a science category score of 396 is indicative of this. This indicates a lack of practice in science literacy in school-based learning.

Additional conditions indicated by students' low science literacy skills are influenced by a number of factors, including low reading interest, assessment instruments that haven't promoted science literacy development, and a lack of science literacy knowledge among teachers. Indonesia will fall well short of other nations and maintain its low ranking in the PISA assessment the following year if science literacy skills are not taught. Not only that, but there is also concern that students lack the general skills necessary for success in the industrialized world, skills like comprehension, identification, interpretation, creation, and communication of knowledge using written materials under a variety of conditions. Since they will essentially have significant and fruitful careers in the future.

In light of this, the purpose of this article is to perform a Systematic Literature Review on the beneficial effects of interactive learning media on students' science literacy. The novelty of this article

is in the systematic analysis of the effectiveness of physics interactive learning media in improving science literacy skills in students. By using this systematic method, this article will collect, analyze, and synthesize findings from various studies to provide a comprehensive overview of the benefits and challenges of using interactive learning media in physics education. The purpose of this article is to find out how the effectiveness of interactive learning media in improving students' science literacy skills, as well as to find important indicators in improving physics learning outcomes through interactive learning media. The results of this review are expected to provide deep insights and practical recommendations for educators, researchers, and policy makers in developing and implementing more effective learning strategies to improve science literacy among learners.

RESEARCH METHOD

The Systematic Literature Review methodology was used in this investigation. Through the identification, assessment, and interpretation of existing research, researchers carry out this method. According to Triandini et al.'s research from 2019, researchers go through and identify multiple articles in a predetermined order during a systematic literature review.

The researchers looked for articles using the keywords interactive learning media, physics learning, and science literacy based on the predefined stages. Ten recognized national journal articles pertaining to the keywords used in the data collection were sourced from Publish or Perish, Google Scholar, Semantic Scholar, and additional sources. The data from the article is shown in a table with the journal name, the year it was published, the author, and the findings of the research. The obtained articles feature comparable research, which are subsequently subjected to analysis and summarization. This article then provides a thorough discussion of the research findings.

RESULTS AND DISCUSSION

Short-term student motivation and interest in learning can be raised through the use of interactive media. Students' learning process is accelerated when there are visual and interactive elements, which can help them grasp physics concepts more quickly. Studies indicate that interactive media can significantly enhance students' learning outcomes quickly, allowing them to access information more quickly and conveniently (Larisu, et. al, 2023). Additionally, using this media can support students in gaining analytical and critical thinking abilities, both of which are crucial for learning science.

Using interactive learning media has a more significant long-term impact. It cultivates a favorable attitude toward studying science in general in addition to enhancing scientific literacy. Through regular practice, students can acquire the abilities required to comprehend and utilize scientific ideas in daily situations. Furthermore, effective learning materials can help students develop the kind of character that is necessary for modern education—teamwork and communication, for example.

The research findings are shown in Table 1 and are based on the ten sources of journal articles that were found to satisfy the inclusion criteria.

Table 1. Application of Interactive Learning Media in Physics Learning to Improve Science Literacy

Journal Code	Author	Year of Publication	Title	Research Results
A1	Annisa Khoirul Hidayati, Najla Adristi Listyowati, Bayu Setiaji	(2023)	Physics Brain Design: A Learning Application for Motion Kinematics to Improve Critical Thinking Skills and Science Literacy of High School Students	The findings indicated that prospective physics teachers felt the learning media design developed received an average score of 42.18 and was placed in the very feasible category so that the Physics Brain application could be used for instruction, while practitioner validators said

Journal Code	Author	Year of Publication	Title	Research Results
				the design received an average score of 45 and was placed in the very feasible category.
A2	Ino Angga Putra, Suci Prihatiningtyas, Asiyah Lu'lu'ul Husna	(2021)	Effectiveness of Interactive Physics Magazine Learning Media on Momentum and Impulse Material	The results of the study explain that the effectiveness of interactive physics magazine learning media seen from the implementation of the lesson plan has gone well in accordance with the developed lesson plan. The activity of students during learning shows a good category, almost all students actively participate in learning using interactive physics magazine learning media. Students' concept understanding after learning with interactive physics magazine media on momentum and impulse material increased by 0.47 which belongs to the medium group. Student reactions to learning provide a positive response.
A3	Ade Kurniawan, Milya Sari, Raudhatul Jannah	(2021)	The Impact of Learning Cycle 5E Model-Based Physics Instructional Video with Adobe After Effects on High School Students' Science Literacy	The science knowledge aspect of the test results is 82.75, while the science competency aspect has an average of 75. Regarding the survey on students' opinions about how easy it is to solve problems and find hypotheses, the results were 90.67% and 89.33%, among other things. According to the study's findings, students' science literacy skills can be greatly enhanced by the learning cycle 5E-based physics learning video, which is made possible with the help of Adobe After Effects.
A4	Rizqi Wahyu Irma Wati, Albertus Djoko Lesmono,	(2019)	Creation of an Interactive Physics Module Based on the High Order Thinking	The validity of HOTS insightful interactive physics learning materials is in the valid category, with

Journal Code	Author	Year of Publication	Title	Research Results
	Sri Handono Budi Prastowo		Skill (HOTS) to Enhance High School Students' Science Literacy on the Topic of Heat and Temperature	an average score of 4.17 for construct validity and a score of 4 for content validity, according to the data analysis development test results. (2) The average N-Gain score for the effectiveness of interactive physics learning materials on heat and thermo, HOTS insights to enhance students' science literacy skills is 0.59 in the moderate category, indicating that the materials successfully enhance science literacy.
A5	Nur Wulan Amalia, Tomo Djudin, Erwina Oktavianty	(2023)	Identification of Learners' Response to Interactive E-LKPD Based on LiveWorkSheets on Temperature and Heat Material	The results of student responses after using Interactive E-LKPD based on several aspects, namely: 84% material aspect, 85.6% display aspect, 83.5% media aspect, and 82% benefit aspect. The overall result of the student response aspect is 83.6% with a very good or very feasible category. By obtaining the results of student responses, It is hoped that E-LKPD will serve as a substitute for traditional teaching materials in order to raise students' level of scientific literacy.
A6	Roro Indah Sukmawati, Joko Siswanto	(2021)	The Impact of Local Wisdom Combined with Digital Learning on Class X SMA/MA Learners' Science Literacy Skills.	The observed variations between the pre- and post-test results demonstrated that, following an experimental class treatment that combined digital learning with indigenous knowledge to improve students' science literacy, student learning outcomes increased.
A7	Nilam Nurmalika Putri, Amiruddin Takda, La Agusu	(2023)	Integrated Nature of Science and Inquiry With Technology (INoSIT) Model for Physics Learning Tools Development:	The data analysis results indicate that the developed INoSIT model learning tools have satisfied the elements of validity, as evidenced by an average

Journal Code	Author	Year of Publication	Title	Research Results
			Improving Students' Science Literacy Competencies in Static Fluid Material Class XI SMAN 1 Kapontori	score of 3.61 and an average reliability coefficient of 90%. If the average score is greater than 2.50 and the reliability coefficient value is greater than 75%, as well as if the learning device's components are practically applicable and effective—that is, if the average n-gain value of 0.56 falls into the moderate category and the t-test yields a significant increase with a sig. 0.00 <0.05—then the data is considered valid. Therefore, it can be said that the elements of validity, practicality, and effectiveness have been met by the developed INoSIT model Physics learning tools, so that high school students' science literacy skills can be enhanced through their use in Physics classes.
A8	Annisa Nur Fadhila	(2022)	Development of PBL-based E-LKPD using Flip PDF Professional to Improve Science Literacy on Magnetic Field Material	The average percentage value of validation, which is 82.61%, and the N-gain of 0.39 obtained from the effectiveness test results are among the research data obtained from the development of this e-LKPD, which places it in the moderate category for improving science literacy skills.
A9	Faradela Naba Sumantri	(2020)	Creation of the Science Literacy E-Book, or ELS-3D, on Momentum and Implus Material	Based on the conducted research, it can be concluded that the ELS-3D (Science Literacy E-Book Based on 3D Page Flip) that has been developed has an overall validation level of 90.34% and very valid criteria regarding media and content. As such, it can be used as a learning media that can enhance science

Journal Code	Author	Year of Publication	Title	Research Results
				literacy using momentum and impulse material.
A10	Vera Marcelina, Iwan Setiawan, Andik Purwanto	(2023)	Development of Physics E-Modules to Train Science Literacy of High School Students on Dynamic Fluid Material	The expert validation test yielded average percentage scores of 71%, 68%, 66%, and 75% for the content feasibility, presentation, language, and science literacy, respectively. The graphic aspect scored 69%, with a fairly valid category.

Based on the research results from the articles analyzed, different interactive physics courses media show significant effectiveness in improving students' science literacy skills. The majority of educational materials created get very feasible and valid ratings from experts and practitioners, this indicates that the media are well designed and fulfill prerequisites for education. Interactive learning media such as applications, videos and E-LKPD are proven effective in raising the level of scientific literacy among pupils. An increase in science literacy test results is indicative of this, positive responses from students and an increase in N-Gain. The learning media used in this study are also considered practical and effective with the majority of students actively participating and showing a significant increase in understanding of physics concepts.

Interactive media offers a more engaging and efficient way to teach complex concepts. Interactivity allows learners to experience a more in-depth and meaningful learning process. It is important to ensure that all students have access to the devices and internet needed to use this media. Teachers need to be educated in the application and integration of interactive educational materials into the independent curriculum. The utilization of interactive educational materials possesses the capability to yield enduring benefits for students' science literacy development. Strong science literacy can help learners understand and apply science concepts in everyday life as well as in future careers.

CONCLUSION

Physics interactive learning media is effective in improving learners' science literacy skills. the research shows that 3D-based applications, learning videos, E-LKPDs and E-Books are not only valid and appropriate, but also significantly in improving learners' engagement and understanding of physics concepts. the development and implementation of interactive learning media is highly recommended in the context of physics education to improve science literacy.

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