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EXPLORATION OF THE LEVEL OF SCIENTIFIC INFORMATION LITERACY OF PALU CITY CLASS VII JUNIOR HIGH SCHOOL STUDENTS

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Abstract

This research aims to explore the level of scientific information literacy of class VII junior high school students in two schools in Palu City. The era of globalization demands students' ability to navigate social media and digital information sources critically. The survey method was used by collecting data from 50 students using structured questionnaires and semi-structured interviews. Five dimensions of scientific information literacy are explored: information acquisition, information filtering, information credibility evaluation, information sharing, and opinion expression. The results showed that the majority of students demonstrated a high level of scientific information literacy, especially in information acquisition and filtering. However, the ability to evaluate the credibility of information and express opinions still requires further attention. These findings highlight the importance of developing students' critical skills in managing and assessing the information they encounter in digital environments. The educational implications of this research include the need for further integration of information literacy education in the school curriculum, with a focus on developing skills for evaluating the credibility of information sources and strengthening the ability to express opinions. Recommended strategies include intensive training for teachers in teaching information literacy, the use of technology to support learning, and the development of assessments that comprehensively reflect students' information literacy abilities. This research contributes to a deeper understanding of the status of students' scientific information literacy at the junior high school level, as well as providing a basis for the development of more effective educational strategies for facing the current challenges of information globalization.

Keywords: Scientific Information Literacy, Junior High School Students

INTRODUCTION

Living in the era of globalization of information challenges education to help class VII middle school students develop understanding and abilities in information literacy and digital media. Science education has an important role in providing a comprehensive understanding of scientific concepts, research methods, and the application of knowledge

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in everyday life. In this context, science education plays a crucial role in facilitating individuals' understanding of scientific information spread through social media. Osborne et al. (2022) highlight the main challenge in science education, namely how educators can contribute to building the knowledge and skills needed in science information literacy and digital media, both in formal and informal educational institutions. Consensus in science and the social practices used by the scientific community to evaluate the sustainability of scientific information on social media are important highlights in this context. With the increasing role of social media as a source of information, critical questions arise regarding the ability of online platforms to provide science news that is accurate and understandable to the general public, including those who are not scientists. Social networking sites play an important role in fulfilling curiosity about scientific developments. The transition of education to online platforms has changed the educational landscape, enabling a more open learning process and increasing the effectiveness of heutagogy. Heutagogy, as a learning approach that gives full autonomy to students to design their own learning with support from facilitators (Tricahyono, 2021), is becoming increasingly important in developing critical independent learning skills for class VII middle school students.

The importance of trustworthy sources of scientific information not only impacts effective risk communication but also takes into account factors such as empathy and credibility in the dissemination of information. A scientific communication evaluation study by Pandey, Shalini, and Kumar (2022) shows that social media, such as Facebook, functions as a platform that facilitates intellectual engagement through interactions such as comments, sharing, and reactions to posts. The concept of scientific information literacy should be considered as a means of understanding the impact of new media on the communication of scientific information (Wang et al., 2023). With the increasing role of social media as a source of information, critical questions arise regarding the ability of online platforms to present science news that is accurate and understandable to the general public, including those who are not scientists. Students often experience difficulty demonstrating advanced abilities in information search and critical evaluation, so the development of information literacy skills is needed. Pressure on teachers to "teach to the test" focuses only on substantive content rather than information literacy skills, and there is a lack of information literacy skills among teachers themselves (Julien & Barker, 2009). According to Osborne & Pimentel (2023), the current science curriculum fails to educate students to become competent as individuals who are independent of science, whereas historically, science education was based on the possibility of students acquiring sufficient scientific knowledge from K–12 education to become independent intellectually and able to evaluate scientific evidence and arguments critically for themselves. This belief underlies many conceptions of scientific literacy and forms the basis of the justifications used to support what is offered in almost all countries around the world. In addition, the science that students will encounter has been filtered so that it can be trusted. However, today the situation is very different, where misinformation abounds and much of it claims to be scientific. The importance of digital literacy is an urgent need to prepare students to

be successful in a world where information continues to flow both through social media and other information sources, especially students' skills in distinguishing quality information from fake information online (Breakstone et al., 2021). In this context, exploring the level of scientific information literacy of class VII middle school students is crucial for identifying challenges and opportunities for strengthening students' skills in navigating complex information in this digital era.

RESEARCHMETHODS

This survey research aims to analyze the level of scientific information literacy of class VII junior high school students. The instruments used were questionnaires and semi-structured interview guides. The research population consisted of 50 students from two schools, namely SMPN 2 and SMPN 10, in Palu City. Sampling was saturated, where all students were the research sample. Scientific information literacy is measured using five basic dimensions that have been established (Wang et al., 2023), namely: the ability to obtain scientific information, filter scientific information, evaluate the credibility of scientific information, disseminate scientific information, and express opinions. The questionnaire consists of 15 statements whose validity and reliability have been tested. Previously, the questionnaire had been tested on 20 class VII students at SMPN 9 Palu with a reliability value (Cronbach's alpha) of 0.87, which shows good consistency in measuring scientific information literacy, and it can be concluded that the questionnaire instrument is reliable or consistent for measuring the level of information literacy among scientific students. Data from the questionnaire was then analyzed using the Miles & Huberman interactive model (Rahmah, 2021), which includes the stages of data collection, data reduction, data presentation, and drawing conclusions. The results of the analysis are used to categorize students' level of scientific information literacy using a predetermined category scale. The questionnaire grid is structured as follows:

Table 1. Survey questionnaire instrument grid

Variable	Dimension Variable	Indicator	Question
Scientific information literacy	self-directed information acquisition	Ability to obtain scientific information	2,5
	accurate information filtering	Ability to filter scientific information	7,11,13
	information credibility assessment	Ability to evaluate the credibility of scientific information	3, 8, 15
	information sharing and dissemination	Ability to disseminate scientific information	1.10
	opinion expression	Ability to express opinions	4,6,9,12,14

The categorization technique for students' scientific literacy abilities is presented in Table 2 below.

Table 2. Category of Scientific Information Literacy Ability

Score	Category
$80 \leq X \leq 100$	Very high
$60 \leq X < 80$	High
$40 \leq X < 60$	Currently
$20 \leq X < 40$	Low
$X < 20$	Very low

RESULTS AND DISCUSSION

RESULTS

The results of administering the questionnaire are as follows:

Table 3. Results of students' scientific information literacy questionnaire

Student	Ability to obtain scientific information		Ability to filter scientific information			Ability to evaluate the credibility of scientific information			Ability to disseminate scientific information		Ability to express opinions				
	2	5	7	13	11	3	8	15	10	1	12	9	4	14	6
1	4	4	4	4	4	4	4	4	3	4	5	5	3	4	3
2	5	5	4	5	4	4	4	4	5	5	4	4	5	4	3
3	4	4	4	5	5	4	2	5	4	4	4	3	3	3	3
4	5	4	3	4	3	3	3	3	5	3	4	2	4	5	2
5	4	3	2	4	4	2	3	3	4	4	2	1	4	3	2
6	4	4	4	5	4	4	4	2	5	4	2	4	2	5	2
7	4	3	3	4	3	3	4	3	5	4	4	4	4	4	3
8	4	4	2	2	5	4	4	3	3	3	3	4	3	3	3
Dst.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
50	5	5	5	4	5	5	5	5	5	4	4	5	4	3	4
Amount	199	205	194	204	195	178	185	172	197	185	183	180	177	181	146
	80	82	78	82	78	71	74	69	79	74	73	72	71	72	58
% per dimension	81			79			71			76			69		
Category	Very high			High			High			High			High		

Students' overall scientific information literacy abilities can be seen in the following picture.

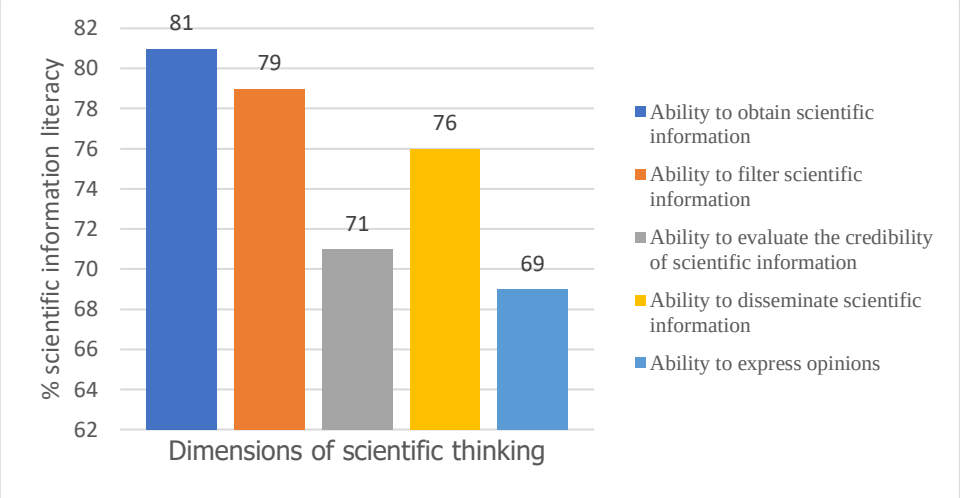

Figure 1. Percentage of students' scientific information literacy questionnaire results

Based on the data results listed in the table, students show a high level of scientific information literacy in various dimensions. The majority of students have good abilities in the ability to obtain scientific information, and 81% of students show high abilities in searching for scientific information from various sources to find out more information. With the ability to filter scientific information, as many as 79% of students have the ability to compare information from various sources to ensure the truth and reliability of the information they get. Ability to evaluate the credibility of scientific information: 71% of students are able to evaluate the reliability of the information they get by looking for information from other sources to ensure the information is trustworthy. Ability to disseminate knowledge information: 76% of students are able to use various media and platforms to obtain scientific information that is useful and important for their knowledge and learning and are able to disseminate this information. As many as 69% of students showed the ability to provide opinions regarding the scientific information that had been obtained and then disseminate scientifically relevant information. The overall score results show that students' scientific information literacy is generally in the high or very high category, reflecting their ability to access, evaluate, and disseminate scientific information well. Related interview questions where students look for scientific information to find out or understand a scientific problem, especially in science learning. The results of the student interview stated, "*I looked for science lesson assignments via the internet*". Students' statements regarding science assignments, for example, scientific studies such as global warming, obtain relevant information from various scientific sites that are available and can be accessed easily, and the information is reliable. The results of student interviews stated that "I can get assignments about global warming via Google by looking for information about the greenhouse effect; usually I look for information that has pictures and written information." Another statement: "If I see who wrote the information for me to include it as a bibliography, I also only take important readings." The student's statement regarding sharing information with other people stated that: "*I type a sentence, for example, about global warming, on Google and there is a lot that I can read... usually I only*

take it from two or three existing link sources... if I want to share, like share or subscribe, I do it, but it's still rare."

Discussion

Based on the data results in the table, it was found that several dimensions of students' scientific information literacy showed a high level. Students demonstrate a good ability to search for scientific information from various sources to gain a deeper understanding of topics of interest. This is reflected in the fairly high score on this dimension, which shows that students are active in searching for relevant sources of information. The results of interviews with students revealed that they often search for science information via the internet, especially using search engines such as Google. For example, in assignments regarding scientific studies such as global warming, students collect information from various scientific sites that can be accessed easily and are considered reliable. Students usually choose information that provides clear images and writing and consider including that information in their bibliography. Even though students are used to accessing the information they need via the internet, their ability to ensure the credibility of information still needs to be strengthened. Students are able to filter information from various sources well and compare information to verify its truth and reliability before it is used or disseminated further. However, generally, they only check the identity of the author and year of writing, while an evaluation of the author's background and the reliability of the information site is still insufficient to ensure the validity of the information before use. Students' ability to disseminate scientific information to others, either through social media or to friends and family, shows that they are active in sharing the knowledge they have acquired. However, their focus is primarily on the material presented and still needs to be improved in ensuring the reliability of information before dissemination. Overall, an educational approach that encourages students to be critical and active in seeking and using scientific information has had a positive impact. However, the challenge of evaluating the reliability of information is still a major focus. The lack of integration of reliability criteria in students' social media evaluation behavior indicates that further efforts need to be made to increase the transferability of students' scientific information evaluation skills. Several factors cause students to be less able to evaluate the reliability of the information obtained. Existing reliability criteria are often not integrated into students' social media evaluation behavior, which indicates a lack of transferability of existing criteria (Kresin, Kremer, & Büssing, 2024). Apart from that, critical thinking skills need to be developed, especially in evaluating scientific information. According to Kolstø et al. (2006), a person needs to have the ability to make decisions that think about socioscientific issues (SSI). This includes a critical assessment of the scientific claims and arguments involved. Some online platforms are prone to the spread of misinformation, highlighting the importance of presenting scientific findings in a way that appears credible (Boothby et al., 2020). The development of critical thinking skills is also very important, especially in the context of assessing

scientific claims and arguments on socioscientific issues. In the context of modern education, which increasingly emphasizes information literacy in the digital era, students' information literacy skills are an important indicator. Schools have greater responsibilities in teaching information literacy, including strengthening curricula that integrate scientific information literacy into science learning. Cooperation with social media platforms can also increase public understanding of the reliability of scientific information. The development of teachers' scientific information literacy skills also needs to be considered so that they can facilitate effective learning by increasing students' scientific information literacy. This is very important in the context of modern education, which increasingly emphasizes information literacy in the digital era. Students' information literacy skills are an important indicator that schools must take greater responsibility for teaching information literacy (Julien & Barker, 2009). Science education is expected to place more emphasis on developing information evaluation skills, including more intensive training in recognizing and verifying the authenticity of information sources. This can be done by strengthening curricula that integrate scientific information literacy into science learning, as well as facilitating collaboration with social media platforms to increase public understanding of the reliability of scientific information. Apart from that, the development of teachers' scientific information literacy also needs to be developed, especially regarding scientific information. According to Pan et al. (2021), developing information literacy at the start of undergraduate studies can improve students' ability to explore scientific literature and their performance in literature-based assignments in advanced courses. Thus, the results of this study demonstrate significant progress in junior high school students' scientific information literacy while also highlighting areas that could be improved in future efforts to increase information literacy.

CONCLUSION

Overall, this research shows that class VII junior high school students in Palu City have shown significant progress in scientific information literacy. Nevertheless, the challenge of evaluating the credibility of information remains a major focus. Therefore, greater efforts are needed to integrate scientific information literacy skills into existing educational curricula, as well as to develop more effective learning strategies for overcoming these challenges. Thus, this research makes an important contribution to our understanding of junior high school students' scientific information literacy while also highlighting areas that could be improved in future information literacy education.

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