Jurnal Penelitian Pendidikan
https://journal.unnes.ac.id/journals/JPP

The Influence of Science on the Mindset of Indonesian Society: A Case Study of the Acceptance of Technology and Popular Science

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Abstract
The development of science and technology has significantly transformed the way people think and interact in modern societies, including Indonesia. This study aims to analyze how science influences the mindset of Indonesian society, focusing on the acceptance of technology and popular science. Using a descriptive-empirical approach, this research employs literature review and secondary survey analysis from sources such as OECD PISA (2022), UNESCO Science Report (2023), and BRIN (2023). The findings indicate that Indonesia's scientific literacy remains below the global average, with cultural and religious factors playing a crucial role in shaping attitudes toward science and technology. Although public perception of science is generally positive, there is a gap between interest and practical engagement, particularly among students. Media exposure and popular science content significantly mediate the formation of scientific attitudes, but low digital literacy often leads to misinformation. The study concludes that the integration of science education with socio-cultural and ethical values is essential to fostering a rational, open-minded, and evidence-based public mindset in Indonesia.

Keywords: cultural factors, popular science, scientific literacy, social perception, technology acceptance

INTRODUCTION

Current developments in science and technology have brought significant changes to the mindset and lifestyle of people in various parts of the world, including Indonesia. The digital revolution, advances in biotechnology, and the dissemination of popular science through the mass media have made science no longer the domain of scientists, but part of people's daily lives. However, the level of public acceptance and understanding of science does not always keep pace with the rapid pace of technological innovation. In Indonesia in particular, various factors such as education level, culture, religious values, and access to information influence how people interpret and respond to scientific developments (Anggraini, 2024; Kamila, Wilujeng, & Rahmawati, 2024).

Various studies show that science literacy and attitudes toward technology are closely related to the social and cultural context of society. Kamila et al. (2024) found that cultural awareness contributes to variations in students' science literacy abilities in Indonesia, which in turn reflects patterns of acceptance of scientific innovation. Wahyuni and Silfianah (2024) emphasize that religious values also shape the way individuals understand and assess science, especially in the context of education and morality. These findings indicate that acceptance of science in Indonesia is cognitive, normative, and emotional.

Suprapto et al. (2023) argue that students' attitudes toward STEM (*Science, Technology, Engineering, and Mathematics*) indicate challenges in fostering interest and trust in science, especially among adolescents.Asyary et al. (2023) on public perceptions of science during the COVID-19 pandemic

reveal that scientific knowledge levels are greatly influenced by information sources and the level of trust in scientific authorities. Exposure to popular science and digital media are important factors that mediate the formation of public mindsets towards science and modern technology.

Changes in mindset due to scientific advances have the potential to influence ethics, cultural values, and national character in a broader social context. Anggraini (2024) notes that the development of modern technology can weaken the orientation of Pancasila values among the younger generation if it is not balanced with values-based character education. Therefore, the acceptance of science and technology needs to be placed in a framework that is in harmony with the national culture and personality of the Indonesian people.

Based on this description, this study aims to analyze the influence of scientific developments on the mindset of Indonesian society, with a focus on the acceptance of technology and popular science. This study uses a descriptive-empirical approach by examining various literature and previous survey findings that examine people's attitudes towards science, educational factors, as well as cultural backgrounds and social values. Through this study, it is hoped that a comprehensive picture will be obtained of how science shapes the mindset of Indonesian society in the modern era, as well as the factors that strengthen or hinder this acceptance.

The Concept of Science and Public Mindset

Science is a system of knowledge obtained through a scientific thinking process that involves observation, experimentation, and logical reasoning to explain natural phenomena (Bybee, 2018). Science not only produces knowledge but also shapes rational, critical, and evidence-based mindsets in society. Society's mindset is understood as a cognitive framework and values that influence how individuals understand and assess information in their social environment (Fauziah, 2022).

The relationship between the development of science and the mindset of society in Indonesia shows complex dynamics. Faujian et al. (2023) found that people's understanding of science is greatly influenced by factors such as education, culture, and belief systems. Changes in people's paradigms regarding science cannot be separated from the surrounding socio-cultural context.

Science Literacy and Technology Acceptance

Science literacy refers to an individual's capacity to understand scientific concepts, apply scientific knowledge in problem solving, and make evidence-based decisions (OECD, 2022). A high level of science literacy encourages society to be open to technological innovation. Conversely, low science literacy can lead to resistance to new science and technology.

Setiaji et al. (2023) show that differences in academic background and access to education influence variations in the science literacy of non-science students in Indonesia. These results confirm that science literacy is cognitive, social, and institutional in nature. Yuliani and Rahayu (2023) show that public perceptions of digital technology are influenced by perceived usefulness and perceived ease of use, as described in *the Technology Acceptance Model* (TAM) by Davis (1989). Science literacy and perceptions of technology serve as key components in understanding how science shapes public thinking.

Popular Science, Media, and Public Perception

The development of digital media has expanded public access to science through the dissemination *of popular science*. Popular science serves to bridge scientific communication between scientists and the general public through social media, news portals, and educational content (Bucchi & Trench, 2021). However, increased exposure to scientific information is not always directly proportional to scientific understanding. Setiawan and Maulana (2023) reveal that the dissemination of scientific information in digital media is often distorted due to ideological bias, social media algorithms, and low information literacy among the public. This can shape partial mindsets, misinformation, or even skepticism towards science. The role of digital media is an important variable that mediates the relationship between science, technology, and public perception of scientific innovation.

Socio-Cultural Factors and Religious Values in the Acceptance of Science

Wahyuni & Silfianah (2024) found that the contextual integration of religious values in education

can strengthen science literacy by increasing ethical awareness in the use of science and technology. Jayadinata (2022) emphasized that the *Science–Technology–Society* (STS) approach, which emphasizes social and cultural relevance in science learning, is important for building a scientific mindset that remains grounded in local values. Therefore, socio-cultural and religious factors act as moderating variables that influence how people accept, interpret, and apply science in their daily lives.

Conceptual Model of the Influence of Science on People's Mindset

Based on empirical evidence theory, the relationship between science, technology, and community mindset can be explained through the following conceptual model:

a) Exposure to popular science and digital media increases
b) science literacy and positive perceptions of technology, which then shape
c) Society's acceptance of scientific innovation,
d) A more rational, open, and evidence-based public mindset, with socio-cultural and religious factors as contextual variables that moderate this relationship.

This model is consistent with *Science–Technology–Society (STS),* which places science as a social force that interacts with culture and societal values (Aikenhead, 2006).

METHODS

Research Approach

This study uses a descriptive-empirical approach with literature study and secondary survey methods. This approach was chosen because the study focuses on describing and analyzing the influence of science on the mindset of Indonesian society based on existing data and research results. This model allows researchers to identify patterns of acceptance of science and technology and understand the social, cultural, and educational factors that influence them.

Data Collection Methods

Research data was obtained through three main methods, namely:

Literature Review

This method was carried out by examining various relevant scientific sources, such as national and international journals indexed by *Sinta*, *Scopus*, and *DOAJ*, scientific books, and survey reports on the scientific literacy of Indonesian society. This literature review includes studies by Kamila et al. (2024), Suprapto et al. (2023), and Wahyuni & Silfianah (2024) discussing the relationship between education, culture, and acceptance of science.

Analysis of Previous Survey Results

The researchers used the results of national and international surveys conducted by official institutions and previous studies as secondary data sources. The data included the results of the OECD's *Programme for International Student Assessment (PISA)* survey (2022) and several studies examining public attitudes toward technological developments and popular science (Suprapto et al., 2023; Kamila et al., 2024). The survey data was processed using qualitative descriptive analysis to reveal general patterns of public acceptance and understanding of science, without collecting primary data directly.

RESULTS AND DISCUSSION

Data Collection Process

Research data was obtained through secondary data collection from various surveys and scientific reports published between 2019 and 2024. Data were obtained through literature studies of relevant Sinta, Scopus, and DOAJ indexed journals, as well as national and international survey reports such as OECD PISA 2022, UNESCO Science Report 2023, and the BRIN Science Literacy Index Survey (2023). The data collection process was carried out in September-October 2025, covering the entire territory of Indonesia. The data was analyzed descriptively to reveal trends and patterns in the acceptance of science among the

Indonesian public.

Data Analysis Results

Table 1. Summary of Secondary Data on Literacy and Science Acceptance in Indonesia (2019–2024)

No	Data Source & Year	Variables Analyzed	Main Findings	Preliminary Interpretation
1	OECD PISA (2022)	Science Literacy of 15-Year-Old Students	Average score 396 (OECD average: 489)	Indonesia's science literacy is still below the global average
2	UNESCO Science Report (2023)	Public participation in scientific activities	Only 23% of respondents are involved in public scientific activities	Community involvement remains low
3	LIPI Survey (2021)	Public perception of modern science	62% agree that science improves quality of life	Views on the benefits of science are quite positive
4	BRIN National Literacy Index (2023)	Level of science and technology literacy	Index score of 0.48 on a scale of 1.00	Science literacy is classified as moderate to low
5	Suprapto et al. (2023, *Indonesian Journal of Science Education*)	Students' attitudes toward science and technology	70% show interest in popular science	There is an increase in interest among the younger generation
6	Kamila et al. (2024, *Journal of Education and Culture*)	The influence of local culture on the acceptance of science	Traditional culture still influences the acceptance of scientific innovation	Cultural factors are important variables
7	Wahyuni & Silfianah (2024, *Journal of Science Literacy and Society*)	The relationship between formal education and science comprehension	The quality of education is correlated with the level of science literacy (r=0.72)	Education is the main determining factor
8	Katadata Insight Survey (2023)	Use of popular science media and social media	58% of respondents learned about science through social media	Media plays an important role in shaping scientific opinion

Source: compiled from OECD (2022), UNESCO (2023), LIPI (2021), BRIN (2023), Suprapto et al. (2023), Kamila et al. (2024), Wahyuni & Silfianah (2024), Katadata (2023).

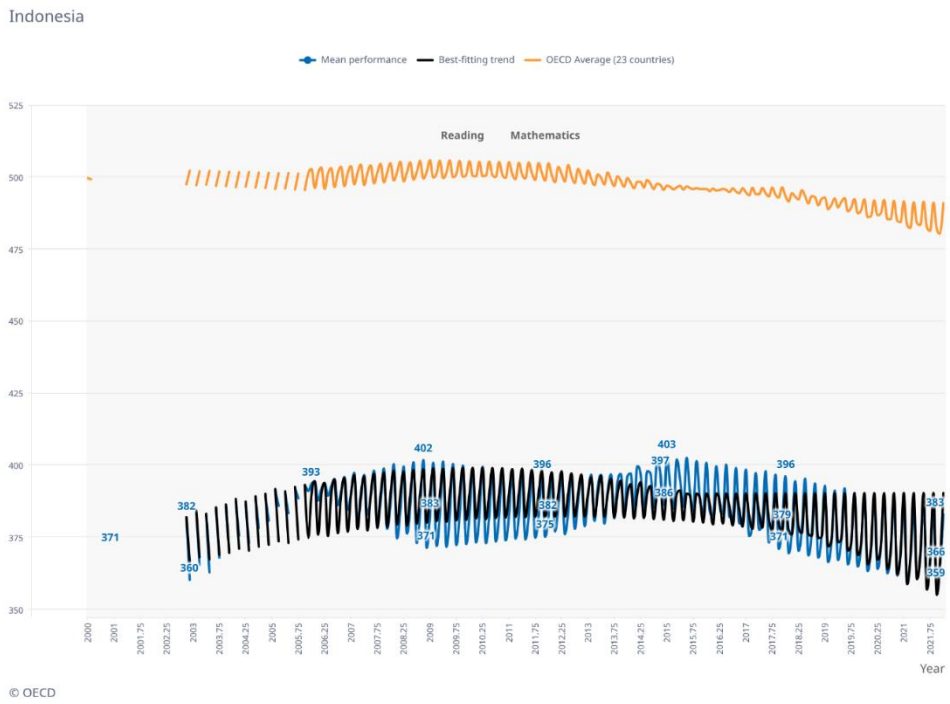
Discussion

Based on a review of literature and secondary data from eight relevant scientific sources, a general picture of the acceptance of science and technology in Indonesia was obtained, reflecting the public's mindset towards modern scientific developments.

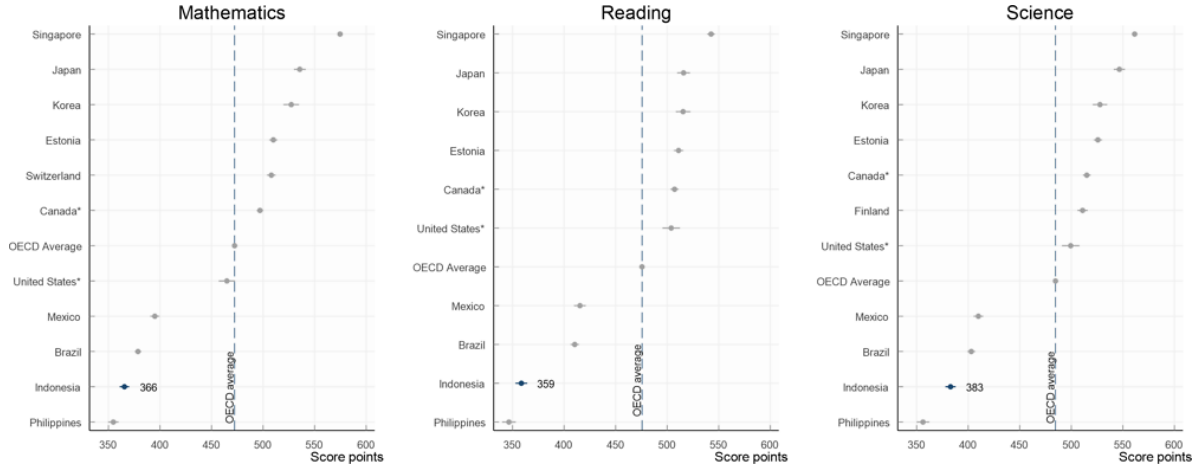
Science Literacy in Indonesia

Data from the 2022 *Programme for International Student Assessment* (PISA) survey shows that the average science literacy score of Indonesian students is only 383 points, far behind the OECD average of 485 points. This gap of 102 points illustrates a significant disparity in the ability to understand, reason, and apply scientific concepts in real-life contexts. Conceptually, these results show that the majority of Indonesian students are not yet able to integrate scientific knowledge with critical thinking and problem-solving skills, which are the main characteristics of 21st-century science literacy.

Furthermore, only 34% of Indonesian students achieved level 2 or above, the minimum level indicating the ability to identify simple scientific explanations or interpret basic experimental data. Two-thirds of Indonesian students are still below the basic competency level, indicating that science education in Indonesia has not succeeded in creating *meaningful learning* and is still oriented towards *rote learning*.



Note: The 2022 PISA results show a decline in student performance in mathematics, reading, and science compared to 2018.
Source: PISA 2022 Results (Volume I and II)
Figure 1. Trends in student achievement in mathematics, reading, and science



Note: The comparison countries include the six countries with the highest performance in each subject and the five countries with the largest populations of 15-year-old students. The horizontal lines extending beyond the markers indicate the level of uncertainty in the average estimates (95% confidence intervals).
Source: OECD, PISA 2022 Database, Tables I.B1.2.1, I.B1.2.2, and I.B1.2.3.
Figure 2. Average student achievement in mathematics, reading, and science

Based on the 2018 PISA results, there is a downward trend in scores in mathematics, reading, and science. This decline indicates systemic problems in the learning process, particularly related to teaching quality, curriculum approaches, and teachers' readiness to integrate science with real-world contexts. External factors such as digital infrastructure gaps and the impact of the COVID-19 pandemic have also exacerbated the situation, causing significant *learning loss*.

Isya'atul Faridah (2022) found that 88% of 118 high school students in South Tangerang were in the "very low" category of science literacy and only 3% were classified as "adequate." These results not only

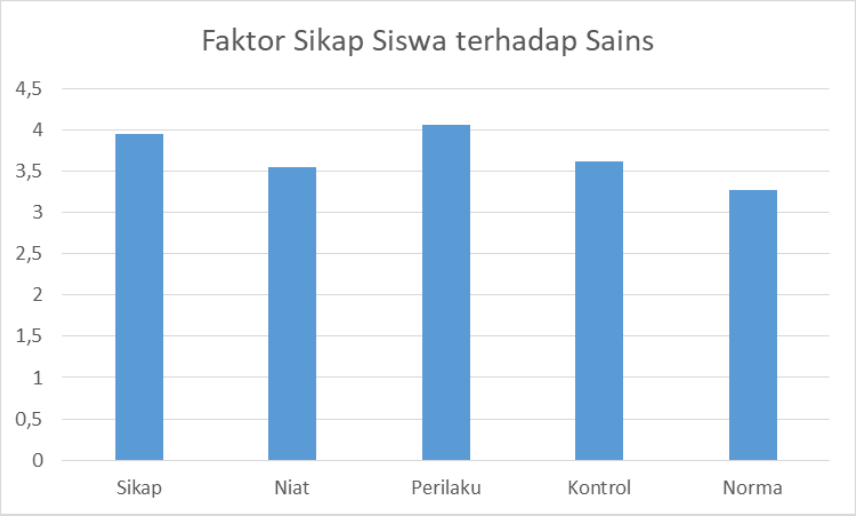
confirm the low cognitive ability in understanding scientific concepts, but also show low digital literacy (69%), which is closely related to the ability to critically search for, assess, and use scientific information. In other words, low digital literacy can worsen the quality of science literacy, because students find it difficult to validate scientific information circulating on social media or the internet.

Arsyad and Sartika (2024) in *the Journal of Education and Learning*, which analyzed the science literacy skills of 400 eighth-grade students at SMPN Sungguminasa from a total population of 1,489 students, showed a similar trend. The results of the study indicate that the science literacy level of students is in the "low" category with an average score of 9.32. These findings indicate that weaknesses in science literacy have emerged since primary education and continue to junior high school, partly due to science learning that does not focus on developing scientific reasoning and the inquiry process. As a result, when students enter higher levels of education, they do not have an adequate conceptual foundation to understand scientific phenomena analytically and reflectively.

Overall, these results show that the main challenges of science education in Indonesia are multidimensional, not only related to students' cognitive aspects, but also related to the learning system, teacher quality, access to technology, and national education policy support. Weaknesses in building a culture of scientific thinking from an early age have the potential to reduce the competitiveness of the younger generation in facing an era of global technology and innovation based on scientific knowledge and data.

Attitudes of the Community and Students towards Science

Suprapto et al. (2023) provide an interesting overview of students' attitudes toward science at the junior high school level. With an average score of 3.78 (high category), it can be interpreted that most students show a positive interest in science both as a subject and as a way of understanding the world around them. This shows that the experience of learning science at school is able to build basic scientific awareness and curiosity about natural phenomena. However, although this positive attitude is quite strong in the affective aspect (interest and appreciation of science), the results of the study indicate that this attitude has not been fully manifested in actual behavior or career aspirations in the STEM *(Science, Technology, Engineering, and Mathematics*) fields.



Note: Average student attitudes toward science
Source: Laksmana, B. D., Winarno, N., Emiliannur, E., & Mustikasari, V. R. (2024). Exploration of Students' Attitudes toward Science: A Case Study in Junior High Schools. Indonesia University of Education
Figure 3. Average student attitude scores toward science based on the BRAINS questionnaire.

The gap between positive attitudes and practical involvement in science can be explained through the *Theory of Planned Behavior* model (Ajzen, 1991), which forms the basis for the BRAINS instrument. According to this theory, the intention to behave scientifically is influenced by three main dimensions: (1) attitude toward behavior, (2) subjective norms, and (3) perceived behavioral control. Suprapto et al (2023)

showed that social and environmental support was not strong enough to encourage students to actually engage in scientific activities outside the classroom, with normative factors receiving the lowest score (3.27). In other words, students may like science, but they do not yet see it as a social value that is appreciated or relevant in everyday life.

The insignificant difference between male and female students in their attitudes toward science indicates a trend toward equality in perception at the secondary education level in Indonesia. This can be interpreted as a positive result of a more inclusive and non-discriminatory curriculum, as well as increased exposure of women to the field of science through the media, contextual learning, and educational policies that encourage equal participation. However, these results also need to be understood in depth because quantitatively similar attitudes do not necessarily indicate equal opportunities in learning experiences, given that socio-cultural factors, gender stereotypes, and family support can still influence students' career choices in the future.

The validation of the MATS (*Measurement of Attitudes Toward Science*) instrument by Rahmawati et al. (2024) provides empirical support for the relationship between social factors, identity, and public perceptions of science. The study found gender and academic level biases, indicating that students with higher academic backgrounds tend to have more positive attitudes toward science, while female students sometimes show lower responses to items related to self-confidence and career interests in science. This implies that attitudes toward science are not entirely socially neutral, but are formed through interactions between educational structures, social environments, and students' personal identities.

Thus, the results of both studies confirm that strengthening positive attitudes toward science needs to be done holistically, not only through conceptual teaching but also by building a learning environment that supports the expression of scientific interest without gender bias, providing enjoyable practical experiences, and fostering social norms that value science as part of a culture of critical thinking and social progress.

Acceptance of Technology and Popular Science

Research by Purwanti, Hidayani, & Oktaviana (2024) on digital citizenship reveals that the acceptance of technology among Indonesian students is not only influenced by cognitive factors or digital capabilities, but also by social factors and moral values. These findings show that even though students recognize the importance of technology in modern education, their perceptions still show an attitude that is not entirely consistent. Most students do acknowledge the role of digital technology as an effective learning tool that is relevant to the demands of the 21st century, but they also associate it with moral risks such as plagiarism, misuse of information, and dependence on social media.

Table 2. Digital Citizenship Level Results

No	Statement	Very Important (%)	Somewhat Important (%)	Neutral (%)	Less Important (%)	Not Very Important (%)
1	Using a cell phone to send test answers to other students	41	38	17	2	2
2	Using email or websites to intimidate other students	18	24	48	5	5
3	Illegally downloading music files from the internet	7	22	54	10	7
4	Unable to complete projects or research due to lack of access to technology	7	15	32	28	18
5	Using a computer in inappropriate situations	6	20	51	11	12
6	Copying information from the internet	5	30	43	18	4
7	Using a cell phone during class	12	17	23	23	25
8	Posting personal information on the internet	2	21	40	33	4
9	Selling or buying goods online during school hours	18	28	36	11	7
10	Dropped out of school due to lack of distance learning alternatives	17	17	48	11	7
Average score for all questions		30				

Source: Purwanti, H., Hidayani, H., & Oktaviana, L. (2023). Digital citizenship among students: Analysis of social factors and moral values. Edukasi: Jurnal Pendidikan Islam, 11(2), 173-18

These findings confirm that the integration of technology in education in Indonesia still faces value barriers, where ethical and character dimensions are important factors in determining the extent to which students are able to use technology responsibly. Digital literacy cannot be separated from moral and spiritual literacy, because the use of technology without ethical awareness can lead to unproductive behavior and even deviate from educational values.

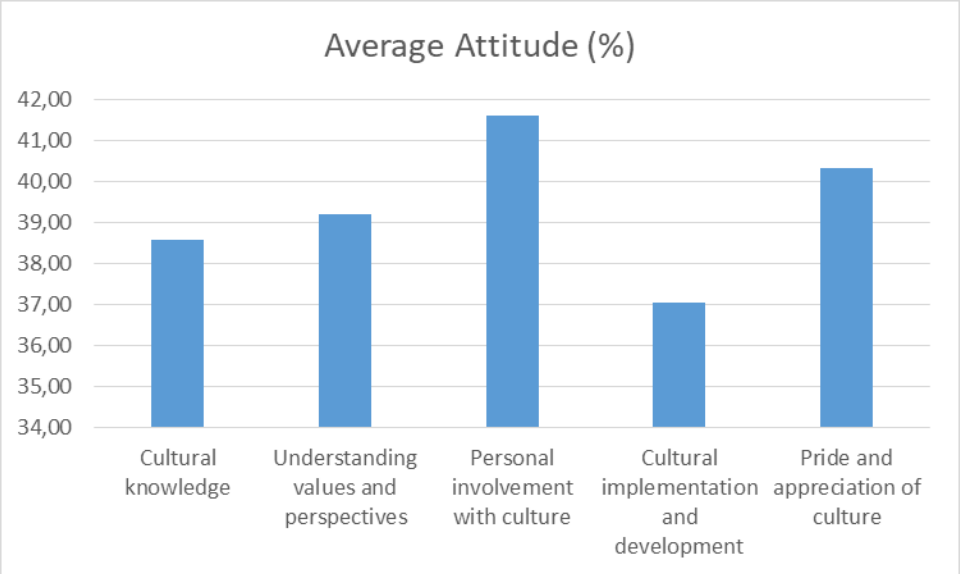
Nasution & Lubis (2024) at UIN North Sumatra researched Muslim students' acceptance of *artificial intelligence* (*AI*) technology. Although AI is becoming increasingly widespread in academic and professional fields, this study found that acceptance of AI is still limited due to ethical and religious considerations. Most respondents expressed concerns that the use of AI could lead to dehumanization in the learning process, diminish the value of human effort, and raise moral dilemmas regarding the authenticity of scientific work and personal responsibility.

This phenomenon shows that the acceptance of science and technology in Indonesia does not only depend on knowledge or technological advancement itself, but is also framed by normative, cultural, and religious values. This reflects the characteristics of Indonesian society, which is religious and collectivist, where technological innovation tends to be interpreted through a moral and spiritual framework.

The implication of these two studies is that science and technology education in Indonesia needs to be balanced with the strengthening of digital ethics and character education, so that the younger generation does not only become technically competent users of technology, but also morally and socially responsible. The integration of religious and ethical values in technology-based learning is important to ensure that scientific development does not stray from its humanitarian and spiritual foundations. Thus, it can be concluded that the low acceptance of science and technology in Indonesia is not solely due to a lack of digital literacy, but also due to normative and moral concerns that reflect the gap between technological advances and the cultural readiness of society to adapt to them.

Cultural and Educational Factors

Kamila, Wilujeng, & Rahmawati (2024) emphasize that cultural awareness has a positive influence on students' science literacy in Sumenep, East Java. Students who are more familiar with the traditions, local wisdom, and cultural potential of their region tend to be able to relate scientific concepts to their daily lives more effectively. For example, they can understand scientific principles applied in traditional agricultural practices, the manufacture of local tools, or natural phenomena related to local culture. This shows that cultural understanding not only enriches social knowledge but also serves as a medium for deepening scientific understanding.



Note: Indicators of cultural awareness
Source: Kamila, K., Wilujeng, I., & Rahmawati, L. (2024). Profile of Science Literacy and Cultural Awareness of Students and the Need for Science Teaching Materials Integrated with Local Potential of STEAM-PBL Based Petis in Sumenep. Journal of Science Education Research, 10(9), 6677–6689.
Figure 4. Average student attitudes toward cultural awareness

Strong cultural awareness enables students to see the relevance of science in the real context of their environment. Science literacy here is not merely memorizing facts or concepts, but the ability to apply, evaluate, and connect science with everyday experiences. For example, students who understand the local ecosystem can explain the interactions of organisms around them using the ecological concepts learned in class. In other words, local culture becomes a bridge that connects scientific theory with real-world practice, making learning more meaningful and interesting for students.

Susanti et al. (2024) reveal that science literacy in Indonesian secondary education has not been fully integrated in a systematic manner. The curriculum tends to emphasize mastery of theory and facts, while the application of science in real contexts or the development of critical thinking skills is still limited. This condition has an impact on the readiness of students and the community in dealing with popular science issues, because they are not yet accustomed to evaluating information, assessing evidence, and making science-based decisions.

The combination of findings from these two studies shows that there is an opportunity to strengthen science literacy through a contextual and culture-based approach. Integrating local wisdom into science learning helps teachers create more relevant and applicable learning experiences. This approach not only improves conceptual understanding but also motivates students to actively learn and think critically about the phenomena around them. Science literacy enriched with cultural context can help students become more intelligent, critical, and adaptive citizens in the face of social and technological change.

Overall, these two studies emphasize the importance of curriculum design that combines cultural and scientific aspects. Science literacy cannot be separated from the context of real life, and cultural awareness is an important factor in facilitating this. Education that combines theory, practice, and local culture will produce a generation that not only masters scientific concepts but is also able to apply knowledge critically and meaningfully in everyday life. The integration of culture and science is an important strategy in the development of effective and relevant secondary education in Indonesia.

Synthesis of Results

Overall, the eight study results above show that:

a) The scientific literacy of Indonesians is still relatively low, both at the elementary and secondary levels.
b) Attitudes toward science are quite positive, but they are not yet accompanied by critical thinking skills and a complete acceptance of popular science and new technologies.
c) Cultural and religious values play a significant role in shaping how the public interprets and accepts science.
d) Access to digital information and the quality of science education are determining factors in shaping the scientific mindset of society.

These findings support the hypothesis that the influence of science on the mindset of Indonesian society is selective and contextual, where acceptance of science is higher for the practical aspects of technology but lower for conceptual and reflective understanding of science (Evans, 2011; Bucchi & Trench, 2014; Lewandowsky et al., 2017). This shows the need for integration between science literacy, cultural values, and character education so that science can play an optimal role in shaping the critical and rational mindset of Indonesian society in the modern era (Aikenhead, 2006; Jegede, 1995; Lickona, 1991). Theoretically, these results reinforce the concept that science literacy is not only a cognitive ability but also a socio-cultural reflection (Bybee, 2018; Fensham, 2008; OECD, 2019). In practical terms, this study shows the importance of collaboration between educational institutions, the media, and the government in strengthening the scientific culture of society (NRC, 2012; UNESCO, 2017; Scheufele, 2013), especially in the context of low conceptual and reflective science literacy in Indonesia (Kemendikbud, 2019; Suwono, 2016; Sari, 2020).

Note: The flow of influence of education on social innovation through literacy and acceptance of science with local culture and social media as moderating factors.
Source: Primary Data
Figure 5. Model of the Relationship between Factors Affecting the Scientific Mindset of Indonesian Society

Based on Figure 5, it is known that education, literacy, acceptance of science, changes in mindset, and social innovation are influenced by moderating factors in the form of local culture and social media. Education is the main foundation in shaping students' literacy skills, which not only include reading and writing skills but also the ability to understand, interpret, and use information critically, including in the context of science. A good level of literacy encourages individuals to be more open to accepting scientific concepts, leading to rational and evidence-based acceptance of science. This acceptance of science further fosters a change in the mindset of society from traditional thinking to critical, analytical, and innovative thinking. This change in mindset is the basis for social innovation, which is the effort to create new solutions to the problems faced by society. This process is not linear, as it is influenced by moderating factors such as local culture and social media. Local culture can strengthen or hinder the acceptance of science depending on how its values are integrated into learning, while social media acts as a means of disseminating information that can accelerate the transformation of mindsets, but also has the potential to cause misinformation if not balanced with adequate digital literacy. The figure emphasizes that education and literacy are the main foundations that drive the acceptance of science and social innovation, with local culture and social media as determining factors for its success.

This model is not limited to the theoretical realm, but is also supported by several previous studies. The results of this study are consistent with the findings of Suprapto et al. (2023) and Wahyuni & Silfianah (2024), which show the important role of literacy and education in promoting the acceptance of science and social innovation. However, these results differ from the study by Kamila et al. (2024), which highlights cultural resistance to scientific innovation. This difference reinforces the view that the acceptance of science in Indonesia is contextual and greatly influenced by the diversity of local cultures and social dynamics in each region. In other words, this shows that the acceptance of science in Indonesia is contextual and not uniform across regions.

CONCLUSIONS

Based on the results of the analysis, it can be concluded that education plays a central role in shaping literacy skills, which form the basis for the acceptance of science, changes in mindset, and the creation of social innovation in society. Strong literacy enables individuals to think critically and be open to scientific advances, thereby enabling them to adapt to changing times. However, this process is not linear because it is greatly influenced by moderating factors such as local culture and social media. Local culture can reinforce values and serve as a bridge in the acceptance of science when properly integrated into learning, but it can also be an obstacle if its values conflict with scientific principles. Meanwhile, social media plays

a dual role as a means of disseminating scientific information and a potential source of misinformation.

There are several suggestions that can be used as a reference for the development of science education in Indonesia. For educators, it is recommended to integrate the local cultural context into the science learning process so that students can understand scientific concepts through real experiences in their environment. For curriculum developers, it is necessary to strengthen science and digital literacy in the national curriculum so that students not only understand science conceptually but are also able to sort out valid scientific information in the digital age. Furthermore, for the government and educational institutions, it is hoped that they can expand teacher training programs on STEAM-PBL-based learning approaches that are contextual to the potential of the region, so that the learning process becomes more relevant and meaningful. The community and parents also have an important role in supporting children's literacy development by creating a learning environment that respects local culture and fosters balanced scientific thinking. In addition, for future researchers, it is recommended to conduct comparative research between regions to understand variations in science acceptance based on differences in local culture and the intensity of social media use in various regions in Indonesia.

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