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Scientific Literacy Instrument In Indonesia: A Systematic Literature Review Using Prisma

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Abstract
The research topic about scientific literacy assessment has become the concern of many scientists recently, including Indonesian researchers. This study aims to conduct a systematic literature review about scientific literacy instrument research in Indonesia for the last 24 years. This research used Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) to identify and screen the articles to be reviewed. In the initial stage, as many as 3,926 articles were found in the database of Google Scholar using several related keywords. Using 7 inclusion criteria that have been determined in the screening process, 102 articles were selected to be reviewed by the researchers in this study. It was found that research on scientific literacy instruments in Indonesia has been growing massively in recent years, with the majority of respondents coming from the western part of Indonesia, making students from the central and eastern areas underrepresented. Reflecting on these findings, challenges and opportunities will be discussed in this paper, along with the suggestion for future research. This research only used one database from Google Scholar, hence next research should consider using other alternatives.
Keywords: *Scientific Literacy; Instrument; PRISMA;Literature Review.*

Abstrak
Topik penelitian tentang asesmen literasi sains akhir-akhir ini menjadi perhatian banyak ilmuwan, termasuk peneliti Indonesia. Penelitian ini bertujuan untuk melakukan kajian pustaka secara sistematis tentang penelitian instrumen literasi sains di Indonesia selama 24 tahun terakhir. Penelitian ini menggunakan Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) untuk mengidentifikasi dan menyaring artikel yang akan ditelaah. Pada tahap awal, sebanyak 3.926 artikel ditemukan dalam basis data Google Scholar dengan menggunakan beberapa kata kunci terkait. Dengan menggunakan 7 kriteria inklusi yang telah ditentukan dalam proses penyaringan, 102 artikel dipilih untuk ditelaah oleh peneliti dalam penelitian ini. Ditemukan bahwa penelitian tentang instrumen literasi sains di Indonesia telah berkembang pesat dalam beberapa tahun terakhir, dengan mayoritas responden berasal dari wilayah Indonesia bagian barat, sehingga siswa dari wilayah Indonesia bagian tengah dan timur kurang terwakili. Oleh karena itu, tantangan dan peluang akan dibahas dalam artike ini, beserta saran untuk penelitian selanjutnya. Penelitian ini hanya menggunakan satu basis data dari Google Scholar, oleh karena itu penelitian selanjutnya sebaiknya mempertimbangkan untuk menggunakan alternatif sumber lain.
Kata Kunci *: Literasi Ilmiah; Instrumen; PRISMA; Tinjauan Pustaka.*

Background

The 5th industrial revolution has brought many impacts into human life, including the types of skills and competences demanded in order to survive in this era. Scientific literacy (SL) has been regarded as one significant skill, along with other 21st century skills, that students need to develop, hence education plays an important role to help them master it (PISA, 2019).

Scientific literacy is broadly understood as the ability students have when they are not only able to connect science with real-life issues, but also critically evaluate social problems. Using this paradigm, science is closely integrated into students' lives in which science is not merely learned as a subject, but valued by students for its benefit science brings to life (Roberts, 2013).

PISA in its framework for science competences has defined that at least, students should master three science competences, namely explain scientific phenomena, design inquiry and interpret data scientifically, and use science to critically evaluate social issues (PISA, 2022). Furthermore, the research about scientific literacy has also divided scientific literacy competence into three visions, where science is not only studied for its knowledge (vision I), but also for its connection with daily life (vision II), and its philosophical values which also encompasses broader areas such as environmental and cultural issues (vision III) (Sjöström et al; 2024).

By reflecting on aforementioned competences of scientific literacy, it is clear that there is an international consensus about scientific literacy competences as the guidance for science education at school (Fischer & Neumann, 2023). Therefore, schools should revolve around these aims in conducting science teaching and learning, where scientific literacy is embedded in the teaching approaches, learning media, and finally in the evaluation process.

Research about SL has grown rapidly in Indonesia with the topics ranging from qualitative research to quantitative research, from developing a specific teaching approach to testing specific instruments to assess students' SL (Hadiastriani and Djarot, 2024; Istyadji, 2023). By using a study case, these research tend to cover small areas with

limited scopes, hence difficult to be generalized if considering Indonesia's huge area and diverse contexts.

Furthermore, up until now, there is still no clear and detailed guidance from the government for teachers about how to assess students' scientific literacy. The national assessment called Minimum Competence Assessment (MCA) was also designed to only assess students' reading literacy and numerical skill, leaving the absence of science national evaluation.

Therefore, before designing a SL assessment that can fit the needs of Indonesian context, it is fair to say that there is a need to understand the research trend of SL assessment in Indonesia. Understanding about the current situation might help the government and stakeholders to bring together these existing-various instruments into a more general instrument to be used at the national level. The novelty of this research will be about the understanding of SL instrument research in Indonesia for the last 24 years as little or no study has been done before about this topic in Indonesia.

This research aims to describe the trend about SL instruments in Indonesia within the year of 2000-2024. These duration were chosen based on two criteria. First, these are the periods where Indonesia agreed to participate in PISA in which science is one main domain in the PISA test. Second, PISA has been used as one main input in reforming the education curriculum in Indonesia and during these periods, the Indonesian government has changed the curriculum four times.

Based on aforementioned background, three research questions were formed. First, this research will examine about the evolvement of SL instruments during the years of 2000-2024 in Indonesia. Second, this research will also explore the article categories such the subjects, level of education, sample size and city where the research was undertaken. Lastly, challenges and opportunities will be also discussed.

The aim of this research is to describe the trends in scientific literacy (SL) instrument research in Indonesia from 2000 to 2024. This study seeks to map the development of SL instruments that have been created and utilized by researchers in Indonesia, including article categories such as research subjects, levels of education, sample sizes, and research locations. Furthermore, this research will identify the challenges and opportunities in the development and implementation of SL instruments within the Indonesian educational context. The novelty of this study lies in its specific focus on understanding the evolution of SL instruments over the past 24 years—an area

that has received little to no comprehensive investigation in Indonesia. The findings are expected to provide valuable insights that can support the government and policymakers in developing a more unified and contextually relevant national framework for assessing students' scientific literacy.

Methodology

This research will employ the approach of PRISMA (Page, et al., 2021) by following four main steps, explained as follows.

1. Identification

In the identification process, keywords such as "*Asesmen Literasi Sains*," "*Instrumen Literasi Sains*" and "*Penilaian Literasi Sains*" were used to search for the articles. Meanwhile, using English, some keywords were also typed such as "Scientific Literacy Assessment in Indonesia" and "Scientific Literacy Instrument in Indonesia". Due to limited access, the database searching used in this research is limited to Google Scholar. The number of articles found in this stage were 3,926 articles.

2. Screening

In the screening process, some criteria were chosen to sort out the articles. These are divided into two categories explained below.

Inclusion Criteria

IC1: Articles must be in the form of journals

IC2: The articles were written in Bahasa Indonesia and English

IC3: The articles must be peer-reviewed.

IC4: Articles can be fully accessed

IC5: The research aimed to develop the instrument for scientific literacy.

IC6: The research was conducted in an educational environment (primary and secondary education).

IC7: The research were related to science subjects (Integrated Natural Science (IPA), physics, biology, and chemistry)

Exclusion Criteria

EX1: Proceedings of congresses, conference papers, books, book chapters, and other non peer-reviewed publications.

EX2: The articles were not written in Bahasa Indonesia and English.

EX3: The articles were not peer-reviewed.

EX4: The articles cannot be fully accessed

EX5: The research did not aim to develop the instrument for scientific literacy.

EX6: The research was not conducted in an educational environment (for example in tertiary education and nonformal education).

EX7: The research was not related to science subjects (Integrated Natural Science (IPA), physics, biology, and chemistry)

In this screening stage, some inclusion criteria were considered, such as IC1 until IC5 and resulting in 265 articles.

3. Eligibility

Based on the screenings, some articles were selected to be read thoroughly building upon the criteria in IC6 and IC7. As many as 118 articles were chosen in this step. The duplicated articles were removed, leaving only 102 articles in this last stage. The chosen articles were then read and examined meticulously by 4 researchers based on 3 research questions. The summary of these steps is presented in figure 1 below.

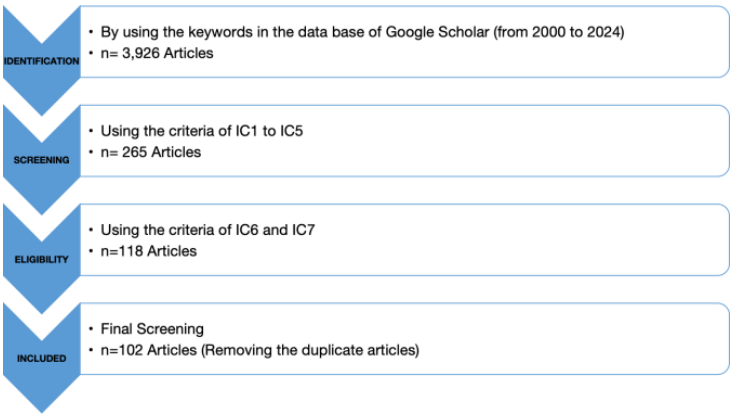

Figure 1. PRISMA stages

Result and Discussion

How has the research about SL Assessment evolved during the years of 2000-2024 in Indonesia?

In the last five years, the research on scientific literacy instruments has increased with the exception of 2024. The finding has shown that in 2024, the number of articles about scientific literacy instruments decreased, although not drastically. The interest of researchers from year to year has indicated a continuous increase, so that research on

scientific literacy always has innovations. The innovations shown, for example, are in terms of the form of assessment instruments used, questions on the scientific literacy assessment used based on science subjects (Physics, Biology, Chemistry, and Integrated Natural Sciences). Figure 1 describes in more details the trend of research of scientific literacy instrument for the last 5 years (2020 to 2024).

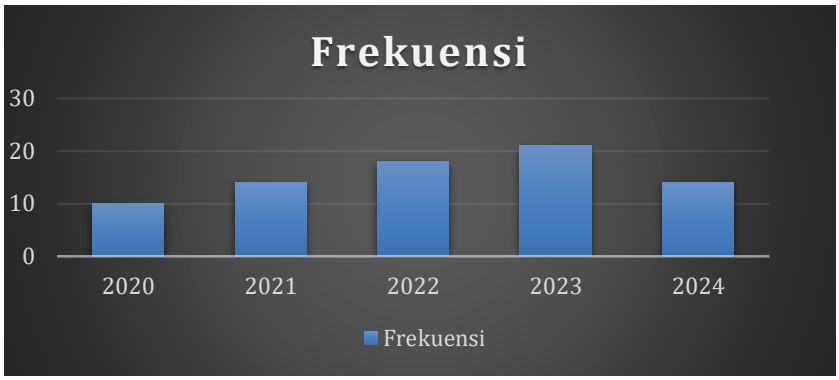

Figure 2. The research trend of scientific literacy instrument in Indonesia between 2020 and 2024

The Category based on Citation

Based on the analysis, it was found that out of 102 articles, eight articles had the most citations. Meanwhile, the other 94 articles had a total of 0 citations or no one had ever cited the article. The most cited paper was the one by Chasanah, et al (2022) with the total citation of 50 times. Based on national ranks, this paper was published in a journal that was ranked 59.

Interestingly, the most cited paper was not published in the top ranked journal. It can be seen from table 1 that journal rank does not affect the number of citations. Out of the top eight most cited articles, the majority of research was conducted at the high school levels, especially about the development of instruments to assess students' scientific literacy in Biology subjects. More detailed information can be seen in table 1.

Table 1. The most cited articles

No	Authors	Year Published	Title	Number of Citation	Journal Rank in Indonesia

1	Nur Chasanah, et all.	2022	*Pengembangan Instrumen Asesmen Literasi Sains Untuk Mendeskripsikan Profil Peserta Didik*	50	59
2	Ardian Asyhari	2019	*Pengembangan instrumen asesmen literasi sains berbasis nilai-nilai islam dan budaya indonesia dengan pendekatan kontekstual*	31	27
3	Wirna Eliza & Eka Yusmaita	2021	*Pengembangan butir soal literasi kimia pada materi sistem koloid kelas XI IPA SMA/MA*	23	47
4	Nukhbatul Bidayati Haka, et all.	2019	*Pengembangan instrumen evaluasi two-tier multiple choice terhadap literasi sains berbantuan personal computer*	14	22
5	Resti Ardianti, et all.	2022	*Pengembangan Instrumen Penilaian Literasi Sains pada Bahasan Usaha dan Energi di Madrasah Aliyah*	7	65
6	Kurnia Dewi	2022	*Pengembangan Instrumen Tes untuk Mengukur Kemampuan Literasi Sains Siswa Kelas V Sekolah Dasar pada Materi Sistem Pencernaan Manusia*	5	69
7	Diah Susilowati	2023	*Analisis Kualitas Instrumen Tes Hasil Belajar Pembelajaran IPAS pada Kemampuan Literasi Sains dan Berpikir Kritis Siswa*	3	93
8	Nurul Apsari	2021	*Instrumen Penilaian Kemampuan Literasi Sains berbasis Indigenous Knowledge pada Materi Asam Basa*	3	54

The Category based on Education Level

Based on the diagram below, it is obvious 57% of the research was conducted in senior high school levels, followed by junior high school levels. These findings will align with the types of subjects researched that will be discussed in the next sections.

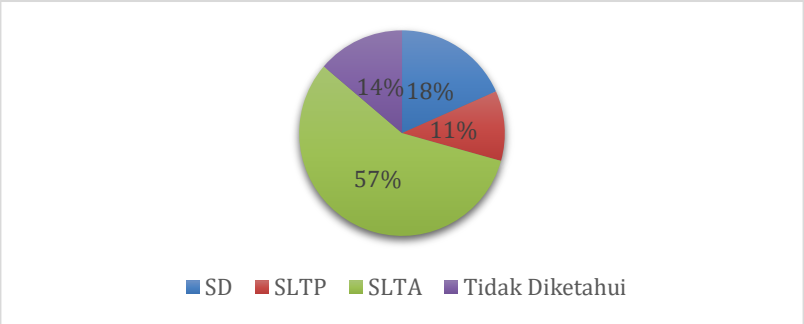

Figure 2. The level of school

The Category based on Sample Size

In terms of sample size, the research can be divided into two groups. The first research group is those that tested the instruments to the sample, both in small scales and big scales, accounting for 74%. Most of the research took the medium samples with the range of sample size from 21-50 respondents. The biggest sample size recorded was 407 Indonesian students who participated in the research, followed by 350 respondents in Magelang regency. Meanwhile, the smallest sample size was only one research that took 10 respondents of students when testing the instrument.

The second research group is the ones that only tested the validity of the instruments by the judgement of several validators. The number of validators taking part in those research was varied, from two to eight validators with three validators as the most size used in those research. More detailed description can be found in table 2 below.

Table 2. Sampel size

Sample Size	**Number of Research**
Sample used in the Instrument Trials (74%)	
< 10 respondents	1
11-20 respondents	10
21-50 respondents	34
> 50 respondents	31
Limited for the Instrument Validation (26%)	

Number of Validators	
2 validators	2
3 validators	14
4 validators	4
5 validators	5
8 validators	1

The Category based on Subjects

Since this research focuses on scientific literacy assessment, it is expected that the subjects in the reviewed articles centered around Natural Science disciplines. The data of education level above says that most of the research was conducted in senior high school levels, resulting in more segmented research where most of research focused on assessing students scientific literacy based on discipline of knowledge.

In the senior high school levels, developing and validating instruments to assess students' scientific literacy in Physics were the most dominant. These researchers frequently chose single physics topics and tested students' scientific literacy based on those topics. Chemistry was the least frequent subject to be researched while the topic about Excretion was the most favorite topic chosen by the researchers when assessing students' scientific literacy in Biology.

As much as 47% of the research was conducted in Integrated Natural Science subjects. Accordingly, this percentage shows that most of the research was also undertaken in the primary and junior high school levels where the subject that is being taught is Integrated Natural Science. Interestingly, 2 research went beyond the limit where they linked other variables to be examined along with students' scientific literacy, such as numerical literacy and religious moral. More detailed data is presented in table 3 below.

Table 3. Group of subjects

Subjects	**Number of Research**
Physics	23 (22%)
Chemistry	10 (10%)
Biology	19 (19%)

Integrated Natural Sciences	48 (47%)
Other subjects	2 (2%)

The Category based the Place of Research

When examining the reviewed articles based on the places where the research took place, it can be seen that there was a tendency of the research in Indonesia to focus on certain parts. From table 3, it can be seen that as many as 93 research (91.2%) was undertaken in the western part of Indonesia, especially in Java island. If examined by cities, most of the research about developing scientific literacy assessment was conducted in Semarang city (17 research), a city located in central Java Indonesia, followed by 13 research held in Surabaya city. Sumatera and Kalimantan also contributed to the research about developing scientific literacy assessment, with Padang and Lampung as the cities where most of the research took place, at 6 research respectively.

On the other hand, it was also found that very limited study about the development of scientific literacy assessment was conducted in the central and eastern part of Indonesia, with only five and two studies respectively. As many as 2 research did not specify the places but stated that they took the samples from all over Indonesia.

Table 4. Research place

Place of Research	**Number of Research**
Western part of Indonesia (93)	
Central Java	36
Eastern Java	25
Western Java	6
Sumatera island	21
Kalimantan island	5
Central Area of Indonesia	**5**

	Eastern Area of Indonesia	**1**
	All area in Indonesia	**3**

What are challenges and opportunities based on the result of this study ?

From the result in the aforementioned findings, some points can be highlighted. First, the research trend of scientific literacy assessment in Indonesia has shown an upward trend where the number of research conducted in Indonesia has been increasing, although with slight decrease in 2024 (Figure 1). It means that Indonesian researchers has been directing their concerns on the improvement of science education assessment, especially when reflecting on Indonesian students' achievement in science based on PISA and TIMSS results (PISA, 2022).

Second, when looking at the data about place of research (table 4), it is obvious that the majority of research was undertaken in the western part of Indonesia, making central and eastern areas of Indonesian students less popular as the places of research. The under-representative of respondents from these areas might also affect the generalization of those research. The highly diverse culture, economics and socio-political in Indonesia also contributes to the difficulties of generalizing the research result. This might also bring challenges for Indonesia in designing a standardized science assessment that could be used nationally as up until now, such assessment is still absent (AKM, 2024).

Third, some research has been trying to adapt international instruments such as ScInqLit and NOSLiT but psychometric standard procedures had not fully followed, such as language and culture adaptation, before proceeding into the validation process. Forth, even though some research has attempted to connect scientific literacy and wider aspects such as numerical skills and religious aspects, these emergence are still limited, showing that segmented and partial research about scientific literacy assessment are still in favour, leaving behind more comprehensive research.

Having said so, however, opportunities might arise from this result. First, these findings could provide an initial data in examining what aspects in scientific literacy assessment research should be covered in the future. The absence of a national instrument of science for Indonesian students can build upon these findings to design and develop suitable national instruments.

Conclusion

This study found that the research trend of SL instrument in Indonesia has shown an upward trend, indicating the opportunity to develop a national assessment of science in Indonesia. However, it can be also seen that most of the samples were taken from the western part of Indonesia. Therefore, future research needs to also take into account the samples from central and eastern in Indonesia to gain more holistic views. This can be done by strengthening the collaboration between science researchers from all over Indonesia. Furthermore, considering Indonesia's diverse culture and huge areas, next research should consider sociocultural aspects in designing more suitable SL instrument for Indonesian students. The challenges and opportunities discussed in this research can considered by future research in order to acquire a more comprehensive views about science education realm in Indonesia.

References

Apsari, N. (2021). Instrumen Penilaian Kemampuan Literasi Sains berbasis Indigenous Knowledge pada Materi Asam Basa. *QUANTUM: Jurnal Pembelajaran IPA dan Aplikasinya*, *1*(2), 60-66. doi.org/10.46368/qjpia.v1i2.500

Ardianti, R., Surahman, E., & Sujarwanto, E. (2022). Pengembangan Instrumen Penilaian Literasi Sains pada Bahasan Usaha dan Energi di Madrasah Aliyah. *DIFFRACTION: Journal for Physics Education and Applied Physics*, *4*(1), 9-14. doi.org/10.37058/diffraction.v4i1.5359

Asyhari, A. (2019). Pengembangan instrumen asesmen literasi sains berbasis nilai-nilai islam dan budaya indonesia dengan pendekatan kontekstual. *Lentera Pendidikan: Jurnal Ilmu Tarbiyah Dan Keguruan*, *22*(1), 166-179. doi.org/10.24252/lp.2019v22n1i14

Azmy, B., & Juniarso, T. (2020). Instrumen Literasi Sains Dalam Pembelajaran Ilmu Pengetahuan Alam Di Sekolah Dasar. Malih Peddas (Majalah Ilmiah Pendidikan Dasar), 10(1), 1-10. doi.org/10.26877/malihpeddas.v10i1.6097

Azizah, S. I. A. I. A., Wahyuni, S., & Budiarso, A. S. (2023). Pengembangan instrumen penilaian berbasis literasi sains menggunakan quizizz untuk mengukur hots pada pembelajaran ipa siswa smp. *Paedagoria: Jurnal Kajian, Penelitian Dan Pengembangan Kependidikan*, *14*(2), 121-132. doi.org/10.31764/paedagoria.v14i2.13971

Bashooir, K., & Supahar, S. (2018). Validitas dan reliabilitas instrumen asesmen kinerja literasi sains pelajaran Fisika berbasis STEM. *Jurnal penelitian dan evaluasi pendidikan*, *22*(2), 219-230. Doi.10.21831/pep.v22i2.19590

Chasanah, N., Widodo, W., & Suprapto, N. (2022). Pengembangan instrumen asesmen literasi sains untuk mendeskripsikan profil peserta didik. *PENDIPA Journal of Science Education*, *6*(2), 474-483. doi.org/10.33369/pendipa.6.2.474-483

Dewi, A. M., & Haryani, S. (2022). Development of Three-Tier Test Instrument Based on Scientific Literacy in Electrolyte and Non-Electrolyte Solution Topics. *Thabiea: Journal of Natural Science Teaching*, *5*(1), 1-16. doi.org/10.21043/thabiea.v5i1.11634

Ellianawati, E., Meilanie, E. P., & Subali, B. (2021). Development of Science Literacy Assessment Based on Multi Representation of Rectilinear Motion Concept to Investigate Students' Science Literacy Competencies. *JIPF (Jurnal Ilmu Pendidikan Fisika)*, *6*(3), 263-276. DOI: 10.26737/jipf.v6i3.2229

Eliza, W., & Yusmaita, E. (2021). Pengembangan butir soal literasi kimia pada materi sistem koloid kelas XI IPA SMA/MA. *Jurnal Eksakta Pendidikan (Jep)*, *5*(2), 197-204. doi.org/10.24036/jep/vol5-iss2/621

Fadillah, E. N. (2017). Pengembangan instrumen penilaian untuk mengukur keterampilan proses sains siswa SMA. *Didaktika Biologi: Jurnal Penelitian Pendidikan Biologi*, *1*(2), 123-134. doi.org/10.32502/dikbio.v1i2.770

Fischer, H. E., & Neumann, K. (2023). Teaching physics. In Handbook of research on science education (pp. 619–656). Routledge.

Hadiastriani, Y., & Djarot, P. (2024). Mapping research trends on development of scientific literacy assessment: A bibliometric analysis. JPBI (Jurnal Pendidikan Biologi Indonesia), 10(1), 211-222. EJ1423018

Haka, N. B., Hamid, A., Nurhidayah, N., Kesumawardhani, A. D., Rudhini, M., & Riski, R. A. (2019). Pengembangan instrumen evaluasi two-tier multiple choice terhadap literasi sains berbantuan personal computer. *Biosfer: Jurnal Tadris Biologi*, *10*(2), 201-214. doi.org/10.24042/biosfer.v10i2.5755

Istyadji, M. (2023). Conception of scientific literacy in the development of scientific literacy assessment tools: A systematic theoretical review. Journal of Turkish Science Education, 20(2), 281-308. doi.org/10.36681/tused.2023.016

Martinah, A. A., Mubarok, V., Miarsyah, M., & Ristanto, R. H. (2021). Pengembangan instrumen tes literasi sains berbasis kontekstual pada materi pencemaran lingkungan. *Bioedusiana: Jurnal Pendidikan Biologi*, *6*(2), 192-218. doi.org/10.37058/bioed.v6i2.3251

Permatasari, A. D. A., Handayani, R. A. D., Siswati, B. H., & Bachtiar, A. A. (2023). Effectiveness Test Digital Assessment based Moodle as a Digital Assessment Instrument for Measuring Science Literacy Skills for Junior High School Students. *JPPS (Jurnal Penelitian Pendidikan Sains)*, 29-41. doi.org/10.26740/jpps.v13n1.p29-41

PISA, 2018. Assesment and Analytical Framework. OECD Publishing.

PISA, 2022. https://www.oecd.org/pisa/

Putri, R. D., Herpratiwi, H., & Rosidin, U. (2021). Pengembangan Instrumen Asesmen Kinerja Berbasis Literasi Sains pada Pembelajaran Tematik Terpadu Peserta Didik Kelas V Sekolah Dasar. *Jurnal Basicedu*, *5*(6), 5946-5952. doi.org/10.31004/basicedu.v5i6.1688

Rahmati, U., Ginting, F. W., Novita, N., & Sakdiah, H. (2024). Pengembangan Instrumen Tes Fisika Berbasis Literasi Sains Pada Materi Gerak Melingkar. *GRAVITASI: Jurnal Pendidikan Fisika dan Sains*, *7*(01), 10-21. doi.org/10.33059/gravitasi.jpfs.v7i01.9472

Roberts, D. A. 2013. Scientific literacy/science literacy. In Handbook of research on science education (pp. 729-780). Routledge.

Susilowati, D. (2023). Analisis Kualitas Instrumen Tes Hasil Belajar Pembelajaran IPAS pada Kemampuan Literasi Sains dan Berpikir Kritis Siswa. *Jurnal Kualita Pendidikan*, *4*(2), 111-117. doi.org/10.51651/jkp.v4i2.355

Syarifuddin, S., Hasnawati, H., Lasaima, O., & Saranani, M. S. (2023). Analysis of Science Literacy Ability of Junior High School Students with the NOSLiT Method of South Konawe Regency. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *11*(1), 206-217. doi.org/10.33394/j-ps.v11i1.7013

Sjöström, J. (2024). Vision III of scientific literacy. Stud. Sci. Educ., 1–36.

Tabacholly, F. A., Susongko, P., & Nafiati, D. A. (2025). Construct Validation of Science Literacy Instrument with Rasch Modeling on Students of Grade VIII Junior High School. *Journal of English Language and Education*, *10*(1), 378-388. doi.org/10.31004/jele.v10i1.652

Utaminingsih, E. S., Ellianawati, E., Sumartiningsih, S., Wuriningsih, F. R., & Puspita, M. A. (2024). Development of science literacy competency evaluation instruments on human circulatory topic.dx.doi.org/10.21043/thabiea.v7i1.24091

Wahyunisah, R. (2023). Pengembangan Instrumen Tes Literasi Sains pada Materi Sistem Pernapasan Manusia untuk Siswa SMP Kelas VIII. *Journal of Natural Sciences Learning*, *2*(1), 43-51. dx.doi.org/10.21043/thabiea.v7i1.24091