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Development of Science Literacy Corner in WiSe Reading Community: Bringing Science to Everyone

Fidia Fibriana[1*], Rizki Nor Amelia[1], Lutfia Nur Hadiyanti[1], Hendra Febriyanto[1], M. Ahganiya Naufal[1], Ni Luh Tirtasari[1], Aya Sofia[2], Surtini Hadi[2]

Universitas Negeri Semarang, Indonesia
The Wiji Semi Reading Community, Indonesia
*Corresponding author: fibriana.f@mail.unnes.ac.id

Abstract
The Wiji Semi (WiSe) Reading Community, in collaboration with Universitas Negeri Semarang, initiated a Science Literacy Corner (Pojok Literasi Sains) to enhance the scientific literacy of its volunteers to broaden the knowledge of how science to WiSe visitors, especially children. This initiative aimed to improve volunteers' abilities in explaining scientific phenomena, evaluating and designing scientific explorations, and interpreting data scientifically. The program included online lectures, mentoring sessions, and hands-on practicums. Pretest and posttest evaluations indicated notable improvements in the volunteers' skills, particularly in explaining scientific phenomena (73% to 79%) and interpreting data scientifically (82% to 86%) while maintaining a high level of competence in evaluating and designing scientific exploration (83%). Overall, the program effectively empowered volunteers to better communicate scientific concepts, thus fostering a greater understanding and engagement with science within the community.

Keywords: book reading community, community service, science corner, science literacy

INTRODUCTION

The mastery of fundamental literacy skills—including reading and writing, numeracy, science, digital, financial, and civic literacy—is crucial for students, parents, and all community members. Literacy culture is also a prerequisite for 21st-century life skills and is particularly significant (Werdiningsih, 2021). There is a need that individuals now have to use scientific knowledge to draw evidence-based conclusions and make decisions related to the natural world, human activities, and everyday life (Kelana & Pratama, 2019). Science literacy encompasses experiences that develop logic, language, and problem-solving skills, thereby equipping individuals to make informed decisions, handle scientific information, apply scientific methods, and possess a thorough understanding of scientific concepts (Suparya et al., 2022).

However, science is often perceived as difficult for some people for several reasons, including cognitive, educational, and socio-cultural factors. Science involves complex concepts that require abstract thinking and a deep understanding of theoretical frameworks. Students often struggle with the abstract nature of scientific theories and the necessity of applying mathematical and logical reasoning. Research indicates that the transition from primary to secondary school exacerbates these challenges, as students encounter more sophisticated scientific content and methodologies, leading to a decline in interest and motivation in subjects like mathematics and science (Kaur et al., 2022). Traditional teaching methods may not always align with students' learning styles, making it harder for them to grasp scientific concepts. Issues such as increased academic pressure, changes in teaching styles, and social dynamics play a role in how students perceive and engage with science education. Additionally, the lack of practical, hands-on experience in science education can hinder the ability to understand and retain scientific knowledge (Kalogiannakis et al., 2021).

The Wiji Semi (WiSe) Reading Community is a group comprised of volunteers who are passionate about cultivating literacy for children and women. "Wiji Semi" is a Javanese phrase that means "growing seed," symbolizing a hope for them to grow into beneficial and productive individuals. The abbreviation of this phrase is WiSe, an English word and it represents the hope of nurturing wise

generations.

The WiSe house (*Rumah Wiji Semi*) is located in Susukan Village, Semarang Regency, and serves as a small library facilitating book reading and exchanges for the community surrounding (Fig. 1). Through WiSe activities, the volunteers support each other to develop a literacy tradition, including encouraging mothers to accompany and read books to their children, maximizing the use of available books to make them more beneficial, fostering an early interest in reading among children, and building a strong socio-emotional bond between parents and children.

Figure 1. The WiSe House (*Rumah Wiji Semi*)

According to the interview and discussion with the founders, it highlighted that many WiSe volunteers have the willingness to improve their science literacy (SL). WiSe members struggle to explain daily life phenomena to some active and creative children. Frequently, after children read books, they ask "why" questions that need to be explained with a scientific approach in simple language. The volunteers often find it difficult to provide answers using simple scientific communication, even though they understand the answers themselves. For example, when asked why we should wash our hands, the response might be to kill germs. This leads to further questions such as "What are germs?" Most children will persistently ask their parents for answers that make sense to them. This challenge is strongly felt, despite the mothers knowing the answers. Explaining these scientific concepts relates to the ability to communicate science effectively.

"Demystifying science" involves transferring scientific knowledge and concepts from experts to the general public in an easily understandable way without losing the main context and concepts. Science communication aims to meet the public's knowledge needs, not just within the scientific community. Effective science communication is expected to enhance public understanding, make science more accessible, and enable public participation in science and technology processes. Motivated by this, WiSe is driven to establish a Science Literacy Corner at Rumah Wiji Semi to help transfer knowledge to the community and enhance their science literacy skills.

The Universitas Negeri Semarang community service team designed a program for community engagement with WiSe based on this need to develop the Science Literacy Corner.

METHODS

Various methods were employed to ensure the expected targets are met effectively and efficiently to implement the community service program. The activities are shown in Fig. 2.

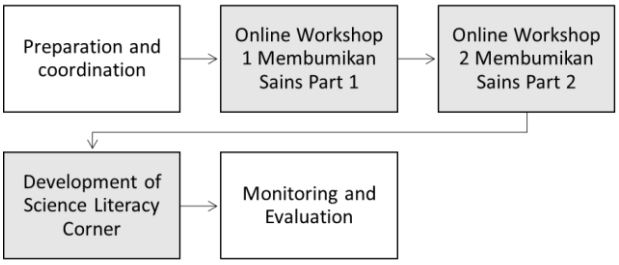

Figure 2. Activities in the community service program

Online Lecture and Mentoring

This method was used to convey theoretical material related to science literacy. It included socializing the goals and benefits of the community Service program and its connection to the

development of the Science Literacy Corner, enhancing the literacy and science communication skills of the volunteers specifically. Before the program, all volunteers were asked to have a pretest, which measured their initial knowledge of science literacy. The socialization was conducted through an online lecture and mentoring entitled "Membumikan Sains" in two parts. Mentoring was conducted to ensure the sustainability of science literacy and communication dissemination. After the program, again they were asked to fill out the same questionnaire to measure their knowledge of science literacy, whether it was improved or not. The questionnaire is available at this link https://shorturl.at/ufavl.

Development of Science Literacy Corner

Science Literacy Corner was developed by facilitating science books, science teaching aids, and science experiment kits related to Biology, Chemistry, Physics, and Mathematics. Some supporting equipment such as bookshelves, tables, and chairs were also provided.

Demonstration and Hands-on Practicum

The community service demonstrated the science teaching aids and science experiment kits to all volunteers. The volunteers learned about preparation, steps of usage, maintenance, and troubleshooting. Demonstrations included examples of science literacy and communication in explaining everyday scientific phenomena.

In this activity, the volunteers were asked to practice the experiments as demonstrated by the community service team. This approach aimed to quickly develop participants' skills through hands-on experience. Also, each participant presented daily phenomena that require scientific explanations. The information was conveyed by scientific way of communication.

RESULTS AND DISCUSSION

Online Lecture and Mentoring

The first objective of the community service program was to improve the science literacy of Wiji Semi volunteers. Their initial knowledge was measured by a pretest and based on the pretest result; they had a moderate level of understanding how science (Table 1). Therefore, the workshop series was conducted to help them understand more about science literacy and how to bring science to the people by learning to communicate science effectively.

The online workshops were conducted in February 2024 with two series of activities entitled *Membumikan Sains* 1, followed by *Membumikan Sains* 2 (Fig. 3). During the workshops, the volunteers learned theoretical material related to science literacy to help them improve their literacy and communication skills. They learned that in fact, science does not only exist in laboratories but everywhere in every aspect. They were encouraged to take the first step in science literacy including making observations and formulating problems. Then, they can look for answers to the why question to prove the phenomenon by reading literature, or even experimenting. In the era of fast information, people need to be able to understand and evaluate phenomena critically.

Figure 3. Membumikan Sains workshop flyers

Moreover, the joint learning was full of entertaining scientific information and community members could participate critically in communicating this scientific information to the public (starting with their families). Kids can ask their parents about every phenomenon while parents have the responsibility of giving the right answer (using their science literacy) according to the age of their

children. Parents have to answer the questions by feeling grateful first, then they have to validate the children's feelings, continuing by clarification, answering, and following up the questions by observation and conducting experiments to prove the question. Bringing science to the people is an effort to foster science literacy with an approach that is easy, fun, and in popular form to make it understandable (Supratman, 2020; Yuriawan, 2021).

All WiSe volunteers also learned about this issue, and they were taught about the essentials of creating a well-informed, innovative, and sustainable society. Science literacy empowers individuals to make better decisions, drives economic and technological progress, and equips society to tackle complex challenges collectively. In essence, science literacy enriches lives, fosters a deeper understanding of the world, and enhances the ability to navigate and shape the future effectively (Ratu & Aini, 2019).

Development of Science Literacy Corner

The community service team facilitated the Rumah Wiji Semi with equipment such as bookshelves, tables, chairs, science books, and fun science experiment kits to support the development of the Science Literacy Corner. Science books including storytelling books, science fiction books, and science books for children were purchased from the local bookstores and online shops. The fun science experiment kits were provided by the university community service team. For example, baking soda, green beans, balloons, mineral water bottles, cups, spoons, food colorants, and water. These components were used to create Chemistry-based science experiments. While other experiments related to Physics, Biology, and Mathematics were conducted using commercial kits available in the marketplace. The community service team prepared the kits and delivered them to the Rumah Wiji Semi in a special grand opening ceremony conducted by the Wiji Semi team. The opening was held in Rumah Wiji Semi and this collaboration activity was successfully followed by all volunteers, the nearby community, and some children who are interested in participating and learning. All participants were invited to join the fun activities including a brief opening speech from the community service team and Wiji Semi team, the giving of POJOK LITERASI SAINS picture in frame from the community service team to Rumah Wiji Semi symbolizing the development of Science Literacy Corner, and fun science experiments with all children helped by the volunteers. The fun experiments were divided into four labs including Chemistry, Physics, Biology, and Mathematics.

Figure 4. Pojok Literasi Sains grand opening event

After the activities, all volunteers were asked to fill out the posttest questionnaire, the result is presented in Table 1.

Table 1. Pretest and posttest results on science literacy skills measurement

Measurement	Pretest (%)	Posttest (%)
Explaining scientific phenomena	73	79
Evaluating and designing scientific exploration	83	83
Interpreting data scientifically	82	86

Three aspects of science literacy skills were measured among all WiSe volunteers. In the first aspect of explaining the scientific phenomena, the pretest score of 73% indicates that before the program, participants had a fairly good understanding of explaining scientific phenomena. After the program, the posttest score improved to 79%, suggesting a positive impact of the training on

participants' ability to explain scientific phenomena. This 6% increase in score reflects that the activity helped participants enhance their knowledge and skills in this area. The second aspect of evaluating and designing scientific exploration, both the pretest and posttest scores are 83%. This indicates that participants already had a strong ability to evaluate and design scientific exploration before the program, and the training did not significantly change this ability. The consistency in scores suggests that the program maintained the participants' existing high level of competence in this area. The third aspect of interpreting data scientifically, the pretest score of 82% shows that participants had a good understanding of interpreting data scientifically before the program. The posttest score increased to 86%, indicating an improvement in this ability following the activities. This 4% increase demonstrates that the program was effective in further enhancing participants' skills in interpreting scientific data. Overall, the program appears to have had a positive impact on two of the three aspects assessed. The data suggest that while participants already had a strong foundation in evaluating and designing scientific exploration, the program was particularly effective in improving their abilities to explain scientific phenomena and interpret scientific data. This indicates a targeted improvement in areas where participants had more room for growth.

CONCLUSION

The Wiji Semi (WiSe) Reading Community, in collaboration with the Universitas Negeri Semarang, established a Science Literacy Corner to enhance science literacy among volunteers. This initiative involved online lectures, mentoring, and hands-on practicums aimed at improving volunteers' skills in explaining scientific phenomena, evaluating and designing scientific exploration, and interpreting data scientifically. Pretest and posttest evaluations showed improvements in explaining scientific phenomena (73% to 79%) and interpreting data scientifically (82% to 86%), while maintaining a high level of competence in evaluating and designing scientific exploration (83%). Overall, the program effectively enhanced the volunteers' ability to communicate scientific concepts, supporting the community in understanding and engaging with science.

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