Vol.12 (1), 2023, 66-73 DOI: 10.23960/jppk.v12.i1.2023.08
Jurnal Pendidikan dan Pembelajaran Kimia
e-ISSN: 2714-9595| p-ISSN 2302-1772
http://jurnal.fkip.unila.ac.id/index.php/JPK/index

Analysis of the Needs of Local Wisdom-Based Science Learning Media on the Topic of Salt Crystallization

Alya Shifa Azzachra[1], Siti Fatimah Yusfi Martika Putri[2], Salmah[3], Nur Faridatus So'imah[4] Fitria Fatichatul Hidayah[5]

Program Studi Pendidikan Kimia
Fakultas Matematika Dan Ilmu Pengetahuan Alam
Universitas Muhammadiyah Semarang
*Coresponding-mail: fitriafatichatul@unimus.ac.id.

Received: January 31th, 2023 *Accepted : Mart: 17*th, 2023 *Online Published: April 30th*, 2023

Abstract: Analysis of the Needs of Local Wisdom-Based Science Learning Media on the Topic of Salt Crystallization. Science learning in chemistry often experiences misconceptions in its application, where chemistry has a high level of difficulty related to its abstract and sequential concepts. So, one way to present learning resources in chemistry is to reconstruct culturally oriented knowledge through interactive learning media by utilizing the potential of local wisdom such as local salt. The research was conducted with a sampling technique using a cross-sectional study. Data were collected through observation, interviews, and distributing questionnaires in the form of questionnaires. The research is focused on analyzing the needs of teaching materials for teachers and high school students in the Semarang area. The results of the study show that teachers need teaching materials that are interactive, interesting, and can be explored easily by students. This is then reinforced by the results of student questionnaires which say that students prefer learning media that are packaged digitally and are closely related to everyday life. In response to this, the most effective use of digital teaching materials is website-based.

Keywords: Science Learning, Local Salt, Local Wisdom, Website

Abstrak: Analisis Kebutuhan Media Pembelajaran Sains Berbasis Kearifan Lokal Pada Topik Kristalisasi Garam. *Pembelajaran sains pada kimia sering kali mengalami misskonsepsi pada penerapannya, dimana ilmu kimia mempunyai tingkat kesulitan yang tinggi berkaitan dengan konsep-konsepnya yang bersifat abstarak dan berurutan. Maka, salah satu cara dalam menyajikan sumber belajar pada ilmu kimia adalah dengan merekonstruksi pengetahuan yang berorientasi budaya melalui media pembelajaran yang interaktif dengan memanfaatkan potensi kearifan lokal daerah seperti contohnya garam lokal. Penelitian dilakukan dengan teknik pengambilan sampel menggunakan Cross-sectional study. Data dikumpulkan melalui pengamatan, wawancara, dan penyebaran angket berupa kuesioner. Penelitian difokuskan pada analisis kebutuhan bahan ajar guru dan siswa SMA di daerah Semarang. Hasil penelitian menunjukan bahwa guru membutuhkan bahan ajar yang interaktif, menarik, dan mampu dieksplor dengan mudah oleh siswa. Hal ini kemudian diperkuat dengan hasil angket siswa yang mengatakan bahwa siswa lebih menyukai media pembelajaran yang dikemas secara digital dan dekat kaitannya dengan kehidupan sehari-hari. Menanggapi hal tersebut maka penggunaan bahan ajar secara digital paling efektif adalah berbasis website.*

Kata kunci: *Pembelajaran Sains, Garam Lokal, Kearifan Lokal, Website*

- **INTRODUCTION**

Constructivism learning theory emphasizes a learning process that requires students to be more active in the process of finding knowledge (Yasthophi & Ritonga, 2018). Education currently is required to continue to develop with many learning systems and methods. This is intended to increase the value of students' interest in learning to produce good scientific literacy. Even so, the desired result are still not fully successful, as evidenced by the result of literacy achievements, especially student's scientific literacy in PISA (Program International Student Assessment) released by the Organization for Economic Cooperation and Development (OECD) in 2019 Indonesia is ranked 62nd out of 70 countries, or are the bottom 10 countries with low literacy rates (OECD, 2019).

Science is the basis of advanced technological developments and the concept of harmony with nature. Where skills in studying science is the basic needs of 21st century education (Nisrina, 2020). These skills are the basic needs of science learning which are currently not taught properly in schools (Astuti, 2014). One of skills that is very important to note so that students are able to apply science appropriately is scientific literacy (Asyhari, 2015). Education should lead to a process of activities that can shape students to be able to face the era of globalization, environmental issues, advances in information technology, convergence of science and technology, knowledge-based economy, rise of creative and cultural industries, shifts in world economic power, as well as the influence and impact of technology-based science (Prihadi, 2014). In this regard, mastery of literacy in reading , mathematics and science is something that must be taken into account (DeBoer, 2000). Scientific literacy itself has been described by Paul de Hart Hurd (1998) as a competency needed by citizens to think rationally about science in relation to personal, social, political, economic problems, and problems that a person may encounter throughout life (Setiawan, 2019).

On the other hand, rapid development of science and technology (IPTEK) also encourages the growth of scientific literacy in students. The development of science and technology must still be balanced with students' understanding in interacting (Situmorang, 2016) in general, students must remain supervised in the implementation of the learning system with the development of science and technology. Scientific literacy cannot be separated from science education. The link between the two is a holistic part. Where activities in scientific learning are activities designed to able to develop students' curiosity, invite students to observe various phenomena that are familiar with their daily lives. One of science education is to help students understand the laws and theories that underline them (biology, physics, chemistry) (Suparno, 2012).

Chemistry learning often experiences misconceptions in its application, this has also received special attention from Nopirawan et al (2016) where chemistry has a high level of difficulty related to concepts in chemistry that are abstract and sequential in nature. It is this difficulty in understanding that causes misunderstanding (Nopriawan Berkat Asi, 2016). One of the chemistry lessons that needs to be corrected is the salt crystallization method. Based on research from Umam (2019) the quality of salt production in Indonesia is arguably still low and learning about salt crystallization processes and methods needs to get more attention (Sari et al., 2014).

Regarding the increasingly rapid development of science and technology, we can take advantage of technological developments to improve the quality of education by providing learning media that are easily available to students. Both in print media, and

multimedia-based media using new programs such as macromedia flash, virtual reality showcase, the web, and many more. Therefore, the learning process must emphasize providing direct experience to develop competencies in order to explore and understand scientific environment (Nopriawan Berkat Asi, 2016).

Learning science by understanding the natural surroundings can also be said to be a science learning system based on local wisdom. As disclosed by the State (2011) (Negara, 2011) learning based on local wisdom does not only involve knowledge or understanding of indigenous/local communities about humans and how good relationships are between humans, but also involves knowledge, understanding and custom about humans, nature and how relationships are between all, where all that knowledge is internalized, practiced, taught and passed down from one generation to another (Umam, 2019).

According to Prasetyo (2013) local excellence is a regional characteristic that includes economic, cultural, information and communication technology and ecological aspects developed from regional potential. Aspects of the potential for developing local excellence include Natural Resources, Human Resources, Geographical, Cultural ad Historical. Local Excellence-Based Education is a planned conscious effort through exploring and wisely utilizing the potential of the local area in an effort to create a learning atmosphere and learning process, so that students actively develop their potential to have skills, knowledge and attitudes in an effort to participate in building the nation and the state (ZK, 2013).

Science learning in chemistry material, especially in salt crystallization material, will focus on local wisdom (Rositawati et al., 2013). Where the most suitable place is the coastal area which later becomes the focus of the author's research. Based on the problems previously described, this research was conducted with the aim of finding teaching materials based on local wisdom that are suitable for the topic of salt crystallization. So, that from this research it is hoped that it can provide references regarding teaching materials based on local wisdom with the topic of salt crystallization which can later be used as an effective and efficient medium for learning science, especially chemistry.

▪ METHOD

The type of research used is quasi-qualitative research. This research was conducted at the UNIMUS Chemistry Education Study Program and 5 nearby high schools. One of the closest local wisdom potentials is the potential of local salt. The research subjects where 5 high school teachers and 140 class XI students from each institution with 56 male students and 84 female students. Sampling technique or subject determination using cross-sectional study. Cross-sectional study is defined as a type of observational research that analyzes variable data collected at a certain point in time. This type of sampling model does not involve carrying out experiments so it is used to understand the result through analysis.

Data collection techniques were carried out using three instruments, namely observation, interviews, and distributing questionnaires in the form of questionnaire link (M.Sesaria, 2020). Observations were made directly to the research and students as well as observations on the surrounding environment, namely schools and the teaching and learning process in the classroom using the five senses. The interviews were conducted with research subjects, namely high school science teachers with a question-and-answer process to obtain mor in-depth information. The interviews were

conducted in a structured manner using interview guidelines that had been prepared beforehand. Furthermore, the questionnaire distribution instrument in the form of a questionnaire was carried out on research subjects, namely 140 class XI high school students with 56 male students and 84 female students from each institution. This is to support the validity of the data that has been collected as well as a benchmark between the result of teacher data and students' data. Overall, the development model can be seen in Figure 1 below.

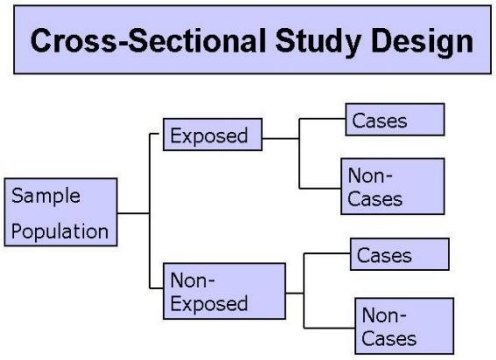

Figure1. Diagram of the Cross-Sectional Study Development model

▪ RESULT AND DISCUSSION

Based on the result of observations made in 5 schools with 5 science teachers and 140 students, it was found that there were several problems. Frist, students experience misconceptions about the application of science material especially chemistry, because it is difficult to understand material with sequential concepts. The occurrence of misconceptions is possible due to the lack of digital interactive learning media that is continuous with everyday life or with the potential of the local area. Second, the learning media obtained do not answer the problems of misconceptions experienced by students. Third, some teachers feel they are unable to understand digital teaching material facilities which have become references for learning media for students.

This was reinforced by conducting an interview system with science teachers. Where the result of the interview showed that the teacher needed interactive teaching materials to support the learning process so that the problem of misconceptions in science, especially chemistry, was reduced. In addition, teachers also need teaching materials that are efficient interesting, and able to make students explore them independently so that teachers who are still unable to understand how teaching materials work can continue to use them.

Some of these things are continuous with the result of the questionnaire in the form of a questionnaire in the form of a questionnaire link from students. Where out of 140 students there were 100 students with 42 male students and 58 female students who preferred website-based digital science learning systems. Then 40 other students like the science learning system with books or both. The result on the choice of learning through the local potential of the area get a response from 109 students with 41 male students and 68 female students. The other 31 students were not interested in

the science learning system, especially chemistry with a local wisdom approach. Then in the choice of learning to use the local wisdom system with examples of local salt topics, 124 students with 47 male students and 77 female students wanted this learning system. While 16 other students are still not interested in the learning system with a local wisdom approach from salt. The result of the next data, more than half of all students no not know the scientific side of making salt and its manufacturing process.

From the results of distributing questionnaire to 140 students, it was found that students liked learning media that was packaged digitally based on a website and was able to be explored widely and closely related to everyday life or the local potential of the region. Based on thus also, students have a high interest in learning science, especially chemistry by using local wisdom systems or everyday life, especially on the topic of salt crystallization. Can be seen in Figure 2 below.

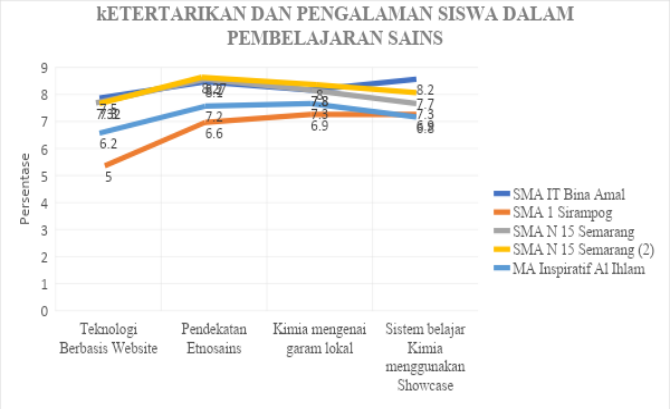

Figure 2. Graph of student questionnaire result

The science learning system, especially chemistry with local wisdom is very useful because students are able to simultaneously study chemistry and learn the potential of local wisdom in their surroundings (SE, 2018). One of potential local wisdoms that can be learned is the topic of salt crystallization in the process of making local salt. Local potential that can be utilized in this study is salt. In addition to preserving the culture of making local salt for the younger generation, the use of salt is very wide and easy to obtain. So, if it needed in learning chemistry, it is not difficult to find it.

The scope of local wisdom used includes agriculture. As already categorized by Sungri (2008) in Wagiran (2012: 332) the categorization of local wisdom according to him includes: agriculture, handicrafts, herbal medicine, management of natural resources and the environment, trade, cultural arts, regional languages, philosophy, religion and culture as well as traditional food (Wagiran, 2010). In addition, the selection of media in implementing science learning, especially chemistry with local wisdom system, needs to pay attention on the selection of media. Based on the result of observations, interviews, and questionnaires, it was found that the needs and desires of learning media lead to several learning resources that are effectively used in science learning, including the surrounding environment, literature, audio-visual, and websites.

Learning resources include all things that can be used to assist a teacher in learning, teaching, and displaying competence. In reality on the ground, there are not many variations of learning resources that are used optimally. Most teachers tend to use textbooks as the only source of learning. Therefore, teachers must develop and design learning resources systematically based on the needs of the learning activities to be carried out and based on the characteristics of the students who will take part in these learning activities. In addition to the selection of learning resources, another thing that is no less important is the selection of methods in learning. Based on the result of interviews with cyan teachers at the high school level, it was found that teachers usually explain science material, especially chemistry, using various lecture methods and assignments. However, there are actually several other methods that can be used to support chemistry learning with local wisdom systems, such as observations, discussions, projects, experiments, and field trips (Widyaningrum, 2018).

Based on relevant research result, one of the topics in chemistry learning that is difficult to understand is salt crystallization. Based in research from Umam (2019) the quality of salt production in Indonesia is arguably still low and more knowledge is needed to direct students. This is line with the result of a questionnaire of 140 students where more than half were interested in a website-based chemistry learning system using a potential approach to local wisdom or everyday life and the surrounding environment. Therefore, the use of website-based learning media through the local wisdom system fits the needs of the research subjects. This is based on the teacher's teaching material needs and student interest. Some of the advantages of using web-based learning media are that they are inexpensive, practical and time efficient, the use of cell phones or learning media is not too heavy, and can be accessed easily. As a result, there is a gap between teachers and students in presenting the use of learning media. So far, teachers have not used interactive media because they are constrained by low digital literacy skills, high learning activities in schools so that there is no time to develop digital teaching materials by teachers.

▪ CLOSING AND CONCLUSION

Based on the research that has been done, it can be concluded that the need for teaching materials that are in accordance with the characteristics of the subject is in the form of website-based showcase learning media that can be explored easily by students. Implementation of chemistry learning in everyday life can be done with an approach based on local wisdom (ethnoscience) by utilizing the local potential of coastal areas. The local potential of the area that can be used as a source of learning materials for salt crystallization methods and local salt.

▪ DAFTAR PUSTAKA

Astuti. (2014). Pengembangan Instrumen Asesmen Autentik Berbasis Literasi Sains Pada Materi Sistem Ekskresi. *Journal UNNES*, *43*(2), 94–102.

Asyhari, A. (2015). Profil Peningkatan Kemampuan Literasi Sains Siswa Melalui Pembelajaran Saintifik. *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, *4*(2), 179–191. https://doi.org/10.24042/jpifalbiruni.v4i2.91

DeBoer. (2000). *Scientific lieracy: another look at is historical and contemporary meanings and its relationship to sciense esucation refrom*.

M.Sesaria. (2020). *Efektifitas Penggunaan Metode Discovery Learning terhadap Hasil Belajar IPA*. *2004*, 6–25.

Negara, P. D. (2011). Rekonstruksi Kebijakan Pengelolaan Kawasan Konservasi Berbasis Kearifan Lokal Sebagai Kontribusi Menuju Pengelolaan Sumberdaya Alam Yang Indonesia. *Jurnal Konstituisi*, *IV*(2), 91–138.

Nisrina, N. (2020). *Pengembangan LKPD Berbasis Blended Learning untuk Meningkatkan Literasi Sains Peserta Didik*. *Vol. 15 No. 3 (2020): Juni*. https://doi.org/10.29303/jpm.v15i3.1880

Nopriawan Berkat Asi, S. M. (2016). *miskonsepsi kimia*. 5.

OECD. (2019). Data PISA Indonesia. In *OECD* (p. Diakses pada tanggal 29 maret 2022). 2019. https://www.oecd.org/indonesia/

Prihadi, B. (2014). Penerapan Langkah-Langkah Pembelajaran Dengan Pendekatan Saintifik Dalam Kurikulum 2013. *In House Traning Implementasi Kurikulum 2013 Di SMPN 8 Kota Pekalongan Tanggal 23-24 Mei 2014*, 1–8.

Rositawati, A. L., Taslim, C. M., & Soetrisnanto, D. (2013). Rekristalisasi Garam Rakyat dari Daerah Demak untuk Mencapai SNI Garam Industri. *Jurnal Teknology*, *2*(4), 217–225. http://ejournal-s1.undip.ac.id/index.php/jtki%0As1.undip.ac.id/index.php/jtki%0A

Sari, R. A., Saputro, S., & Saputro, A. N. C. (2014). Pengembangan Modul Pembelajaran Kimia Berbasis Blog Untuk Materi Struktur Atom dan Sistem Periodik Unsur SMA Kelas XI. *Jurnal Pendidikan Kimia*, *3*(2), 7–15. http://www.jurnal.fkip.uns.ac.id/index.php/kimia/article/view/3343

SE, A. (2018). Pengembangan Perangkat Pembelajaran IPA Terpadu Berpendekatan Etnosains. *Jurnal Pendidikan Sains*, *5(2)*, 5–13.

Setiawan, A. R. (2019). Pembelajaran Tematik Berorientasi Literasi Saintifik. *Jurnal Basicedu*, *4*(1), 51–69. https://doi.org/10.31004/basicedu.v4i1.298

Situmorang, R. P. (2016). Integrasi Literasi Sains Peserta Didik Dalam Pembelajaran Sains. *Satya Widya*, *32*(1), 49. https://doi.org/10.24246/j.sw.2016.v32.i1.p49-56

Suparno, P. (2012). *Pendidikan Karakter dalam Perspektif Sains dan Religi*. *September*, 90–91.

Umam, F. U. (2019). Pemurnian Garam dengan Metode Rekristalisasi di Desa Bunder Pamekasan untuk Mencapai SNI Garam Dapur. *Jurnal Ilmiah Pangabdhi*, *5*(1). https://doi.org/10.21107/pangabdhi.v5i1.5161

Wagiran. (2010). Pengembangan Model Pendidikan Kearifan Lokal dalam Mendukung Pembangunan Provinsi Daerah Istimewa Yogyakarta 2020. *Jurnal Penelitian Dan Pengembangan*, *3(3)*, 1–29.

Widyaningrum, R. (2018). Analisis Kebutuhan Pengembangan Model Pembelajaran Berbasis Etnosains Untuk Meningkatkan Kualitas Pembelajaran Ipa Dan Menanamkan Nilai Kearifan Lokal Siswa Sekolah Dasar. *Widya Wacana:*

Jurnal Ilmiah, *13*(2), 26–32. https://doi.org/10.33061/ww.v13i2.2257

Yasthophi, A.-, & Ritonga, P. S. (2018). MISKONSEPSI MAHASISWA MENGENAI IKATAN ION DALAM SENYAWA NaCl. *Konfigurasi : Jurnal Pendidikan Kimia Dan Terapan*, *1*(2), 195. https://doi.org/10.24014/konfigurasi.v1i2.4306

ZK, P. (2013). Pembelajaran Sains Berbasis Kearifan Lokal. *E-Journal UNESA*, 152–158.