



LITERATURE STUDY DESIGN AND TESTING OF TEACHING MATERIALS THROUGH INTEGRATED INQUIRY TRAINING ON THE LOCAL POTENTIAL MOLOKU KIE RAHA TO INCREASE STUDENTS' CHEMICAL LITERACY

Nur Asbirayani Limatahu^{1*}, Arismunandar², Darman Manda³, Chumidach Roini⁴, Iqbal Limatahu⁵
^{1,2,3}makassar State University, Indonesia
^{4,5}khairun University, Indonesia
*nurlimatahu29@gmail.com

ABSTRACT

This research aims to obtain an overview of the design and testing of teaching materials through integrated inquiry training on the local potential of Moloku Kie Raha to increase students' chemical literacy. The type of research used is a literature review. The literature review is carried out to collect and extract the essence of previous research and analyze several expert overviews written in the text. Based on the results literature review know that many local potential-based or environment-based teaching materials have been presented in the classroom. Module teaching materials based on local wisdom are one learning resource that can increase students' scientific literacy. Chemical literacy abilities include four aspects namely knowledge, context, competency, and attitude. In this way, lecturers or educators can utilize local potential as a learning resource for further research and development.

Keywords: *Teaching materials, local potential, chemical literacy, literature review.*

1. INTRODUCTION

Education has an important role in improving students' abilities to face the challenges of changing times, in line with the very rapid development of science and technology (IPTEK). Likewise, LPTK (Institute for Educational Personnel Education) in Higher Education has the task of preparing prospective professional teachers, in order to develop the competencies of quality students. Competencies or abilities, including chemical literacy skills, can be developed in chemistry learning.

Chemical literacy is the ability to understand chemistry and apply chemistry in everyday life (Witte and Beers, 2003). Aspects of chemical literacy (OECD, 2016), namely knowledge (knowledge), context, competency and attitude. Based on the results of the 2015 PISA assessment (Al Idrus & Hulwati, 2022), the chemistry literacy scores of students in Indonesia are still low. In line with research results from Nurhidayati & Khaeruman (2017) of 71.5%, it shows that students' chemical literacy abilities in the material of substances and their changes are still in the medium category. The low chemical literacy skills of students in Indonesia are because some students still cannot explain chemical reactions that occur in nature and cannot even apply chemical concepts in everyday life.

In connection with the problem of chemical literacy skills, one solution for learning chemistry is the development of teaching materials that integrate the local potential of Moloku Kie Raha. This teaching material can play a role in facilitating students as prospective teachers to master chemical concepts, especially colloid material, and improve chemical literacy skills. Because lecturers are expected to be able to apply learning supported by integrated chemistry learning resources to everyday life students. Lecturers can also present the real world in the classroom to encourage students to make connections between the knowledge they have and apply it in everyday life so that chemistry learning objectives can be achieved through constructivism-based learning practices. Constructivist learning theory, namely the knowledge and experience, gained by students is the result of construction that has been carried out through the active involvement of students, both physically and mentally, to gain new knowledge and experience (Huitt & Dawson, 2011; Sumardi, *et al.*, 2020).



This teaching material is one way to improve learning in the classroom because it is designed as a learning resource whose activities are implemented through a learning model. The learning model used is an inquiry training learning model with the following syntax: confronting/facing the problem; collecting data to verify until problems arise and determine hypotheses; collecting data through experimental activities; processing data/ information, and analysis of the inquiry process Joyce, *et al.* (2011). The activities in the teaching materials implemented through inquiry exercises begin with problems/questions that require students to carry out investigations so that students can discover knowledge independently or in groups in learning and chemical literacy skills can be improved.

This is in line with research on the application of the inquiry training learning model Widodo & Nursanti (2013), which can improve student learning outcomes. Therefore, the literature study from this article aims to obtain an initial overview of the design and testing of teaching materials through integrated inquiry training on the local potential of Moloku Kie Raha to increase students' chemical literacy.

2. METHODS

The type of research used is a literature review. The literature review is a research methodology that aims to collect and extract the essence of previous research and analyze several expert overviews written in the text (Snyder, 2019). In line with Zed (2008), it explains that the literature study method is a series of activities related to methods of collecting library data, reading data, taking notes, and managing writing materials. Stages literature review which the author uses refers to Snyder (2019) namely 1) designing a review, 2) conducting a review, 3) analyzing, and 4) writing a review.

3. RESULTS & DISCUSSION

Based on a search for articles related to the design and testing of teaching materials through integrated inquiry training on the local potential of Moloku Kie Raha to increase students' chemical literacy, the following results were obtained:

- 1) Research by Riza, *et al.* (2020), resulted in the chemistry module that had been developed being declared valid by material experts (mean 85.30%) and media experts (mean 87.32%) and obtained a positive response from students which could be seen from the achievement of learning outcomes and his motivation. Thus, it can be concluded that the chemistry module based on local wisdom regarding acid and base solutions is suitable for use in learning.
- 2) Research by Permataningsih, *et al.* (2021), shows that from the results of validation by five experts to determine the validity of the module, the data obtained on the assessment aspects of content, presentation, language, graphics, and scientific literacy in the module received a validity value > 0.80 with a very valid category. The results of this research show that the module developed meets the validity criteria and the module's teaching materials can be used to support students' scientific literacy in schools.
- 3) The results of research by Siregar (2021), show that the chemistry learning module on material on the periodic system of elements based on literacy culture is suitable for use as teaching material. The increase in chemistry learning results from three meetings, the average pre-test score was 69 and after using the module the post-test results became 91.97., n-Gain the average is 0.81 in the high category.
- 4) The profile of student responses to the use of integrated science teaching materials regarding processing sugar cane as renewable energy obtained a result of 87.83%. Shows that using integrated science teaching materials can improve students' scientific attitudes and environmental awareness (Nuraini & Supeno, 2017).
- 5) Research Eralita & Setiawan (2022) obtained a result of 71.5%, showing that students' chemical literacy abilities in the material of substances and their changes are still in the medium category. With each aspect, the percentage obtained was: knowledge (72%), context (69%), competence (70%), and attitude (75%).



- 6) Development of biotechnology teaching materials based on local potential. It has been identified that there is a lot of local potential that can be utilized as a biotechnology learning resource to increase students' understanding and make their learning more meaningful (Nurhidayati, & Khaeruman, 2017).

4. CONCLUSION

Based on the results literature review, it is known that teaching materials based on local potential or environment-based ones to be presented in the classroom have been widely used. Module teaching materials based on local wisdom are one learning resource that can increase students' scientific literacy. Apart from that, the chemistry learning module on the periodic system of elements based on literacy culture as teaching material can improve learning outcomes. Chemical literacy abilities include four aspects namely knowledge, context, competency, and attitude.

5. ACKNOWLEDGMENTS

The author would like to thank all parties, the Makassar State University and Chemistry Education Study Program FKIP Khairun University, who have assisted in completing this research.

REFERENCES

- Huitt, W., & Dawson, C. (2011). *Social Development: Why It Is Important and How to Impact It*. In Educational Psychology Interactive. Valdosta, GA: Valdosta State University.
- Joyce, B., Weil, M., and Calhoun, E. (2011). *Models of Teaching*, Eighth Edition, Boston: Pearson Education, Inc.
- Nuraini, L., & Supeno. (2017). Profil Respon Mahasiswa Terhadap Penggunaan Bahan Ajar Ipa Terpadu Tentang Pengolahan Tebu Sebagai Energi Terbarukan. *Saintifika: Jurnal Ilmu Pendidikan MIPA dan MIPA*, 19(2), 64-73.
- Eralita, N. & Setiawan, Y.A. (2022). Studi Literasi Kimia Siswa Sekolah Menengah Kejuruan pada Materi Zat dan Perubahan. *Jurnal Eduscience*, 9(3), 792-801.
- Nurhidayati, S. & Khaeruman (2017). Pengembangan Bahan Ajar Bioteknologi Berbasis Potensi Lokal. *JUPE*, 2(2), 87-91.
- OECD (2016). *Assessment and analytical framework: Science, reading, mathematics, and financial literacy*. Paris: OECD Publishing.
- Permataningsih, I., Istiyadi, M., & Hafizah, E. (2021). Pengembangan Bahan Ajar IPA SMP Topik Klasifikasi Materi dan Perubahannya Untuk Menunjang Literasi Sains. *Vidya Karya*, 36(1), 49-60.
- Al Idrus, S. W. & Hulwati, S. (2022). Science Literacy Skill of Chemistry Education Students on Waste Management Materials. *International Journal of Science Academic Research*, 3(9), 4409-4413.
- Riza, M., Firmansyah R. A., Zammi, M., & Djuniadi D. (2020). Pengembangan Modul Kimia Berbasis Kearifan Lokal Kota Semarang pada Materi Larutan Asam dan Basa. *Jurnal Pendidikan IPA Veteran*, 4(1), 25-38.
- Snyder, H. (2019). Literature Review as a Research Methodology: An Overview and Guidelines. *Journal of Business Research*, 104, 333-339.
- Sumardi, L., Rohman, A., & Wahyudiati, D. (2020). Does the Teaching and Learning Process in Primary Schools Correspond to the Characteristics of the 21st Century Learning. *International Journal of Instruction*, 13(3), 357-370.



- Siregar, TS. (2021). Pengembangan Modul Kimia Pada Materi Sistem Periodik Unsur Berbasis Budaya Literasi. *Jurnal Ilmu Pendidikan Indonesia*. 9(1), 27-33.
- Witte, D. & Beers, K. (2003). Testing of chemical literacy (chemistry in context in the Dutch national examination), *Chem. Educ. Int.*, 4(1), 1-3.
- Widodo & Nursanti, D. (2013). Penerapan Model Pembelajaran Latihan Inkuiri untuk Meningkatkan Keaktifan Lisan dan Hasil Belajar dalam Pembelajaran Fisika Pada Siswa Kelas VII SMPN 2 Pandak Bantul. *Indonesian Journal of Applied Physics*, 3(2), 150-157.
- Zed, Mestika. (2008). Metode Penelitian Kepustakaan. Jakarta: Yayasan Obor Indonesia.