

THE DEVELOPMENT OF BIOLOGY E-POCKET BOOK TO IMPROVE SENIOR HIGH SCHOOL STUDENTS' BIOLOGY LITERACY ABILITY

Mega Candra Kumalasari, Joko Waluyo, Iis Nur Asyiah

University of Jember, Indonesia

Email: megacandra23@gmail.com, jokowaluyo.fkip@unej.ac.id,

iisnaza@gmail.com

ARTICLE INFO ABSTRACT

Received:

**Ferbruary,
26th 2022**

Revised:

**March, 15th
2022**

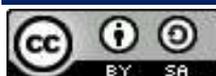
Approved:

**March, 16th
2022**

This research aimed at improving biology literacy ability based on HOTS (Higher Order Thinking Skill) by using E-pocket book learning media. This research employed a research and development (R&D) method, which was used as actual proof in improving a learning media of HOTS-based E-pocket book. There were 10 schools, including state or private schools, and 10 biology teachers as need analysis involved in this study. A needs assessment was conducted by using a questionnaire generated in Google form. The result of the needs assessment showed that teachers understood the HOTS learning process of 90%, HOTS learning material of 80%, and the teachers' knowledge on E-pocket book learning media of 50%. Therefore, all of the teachers (100%) agreed if E-pocket book learning media is implemented for the students and if the learning media that can improve the students' biology literacy should be developed.

KEYWORDS

Biology, E-Pocket Book, Hots, Learning



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International

INTRODUCTION

Education is one of the essential aspects of improving the quality of a nation. Good education quality is in line with the progress and quality of the country. Stepping into the 21st-century era, education becomes more critical to ensure that each student has

How to cite: Mega Candra Kumalasari, Joko Waluyo, Iis Nur Asyiah. (2022). The Development of Biology E-Pocket Book to Improve Senior High School Students' Biology Literacy Ability. Journal Eduvest. Vol 2(3): 470-474
E-ISSN: 2775-3727
Published by: <https://greenpublisher.id/>

skills based on the demands of the 21st century (Andrian & Rusman, 2019). Partnership for 21st Century Skills-P21 (2009) classified 21st-century skills as follows: 1) learning and innovation skills, 2) life and career skills, and 3) media and information technology skills. Therefore, one of the problems Indonesian faces is the quality of education which is still relatively low. This is supported by the Program for International Student Assessment (PISA) assessment result, which showed that Indonesia is still below the average standard of PISA and ranks 72 out of 77 countries that take the PISA test (OECD, 2019). In order to solve problems in real life, children must be able to apply knowledge of scientific facts and the relationship between science, technology, and society. This is what is then called science-literate children (Ibnu & Rahayu, 2020).

Science literacy is one of the sixteen skills needed in 21st-century learning PISA 2018 defined science literacy as the students' ability to involve in the issues related to science and science ideas as reflective citizens (OECD, 2019). Science literacy provides aspiration on the development of curriculum, learning material and assessment practice; therefore, if the science material and learning were facilitated with the competencies, the students' science literacy would develop (Roberts, 2013). Since science literacy is a broad concept, teaching any particular subject matter in science education should contribute to training science-literate people (Celik, 2014). Consequently, this causes an emergence of theoretical definitions such as biological literacy and chemical literacy as part of science.

Biology as a branch of natural science provides various learning experiences to understand concepts and natural phenomena related to living things. Moreover, the biological phenomena are also solved through the ability of students' process skills to find facts build scientific concepts, theories, and attitudes (Turnip & Hasruddin, 2018). Giving HOTS questions aims at creating learning that makes students empower thinking skills and use their reasoning. Senior high school teachers need to understand aspects in developing HOTS questions, and this is in line with the Government Regulation Number 19 of 2005 Paragraph 19 Verse 1, which stated that the learning process in the education unit is held in an inspiring, interactive, fun, challenging and motivating way for students to participate in learning activities actively.

High Order Thinking Skills (HOTS) comprises a broader way of thinking to find new challenges. High Order Thinking Skills (HOTS) encourages a person to apply new information and previous knowledge and processes information to solve a problem (Heong et al., 2011) (Susilo, Adisaputera, & Lubis, 2019). High Order Thinking Skills (HOTS) is a thinking process in exploring complex, reflective, and creative experiences to acquire knowledge that includes analytical, synthetic, and evaluative thinking levels. (Yuniar, Rakhmat, & Saepulrohman, 2015). There are four groups of High Order Thinking Skills (HOTS), namely problem solving, decision making, critical thinking, and creative thinking. A teacher's success in delivering material is influenced by the learning media used and the student's role in the learning process. The teacher's role is needed to improve students' thinking skills. Teachers should design and implement learning media to attract the students' interest, and thus they can master and receive the learning materials.

Learning media have advanced and developed along with the birth of the communication revolution that is utilized for learning purposes other than pre-existing media such as teachers, textbooks, and whiteboards, however learning technology referred to can be in the form of media that can help to facilitate humans in doing work mainly on the field of education foremost during the pandemic that we are currently experiencing (Yaumi, 2018). In this Covid-19 situation, the curriculum is something that must be adapted. During the lockdown teachers were instructed to teach through online learning media. The Covid-19 outbreak caused a digital revolution in the higher education

system through online lectures, teleconferences, digital open books, online exams, and interactions in virtual environments (Muyaroah & Fajartia, 2017). The E-Pocket Book learning media can be used at any time, it can be used during a pandemic, make it the same like during a face-to-face meeting. An electronic pocket book is simple, can be carried anywhere, and contains information in the form of text or images that can be displayed on a digital screen. In developing learning media, it is necessary to pay attention to the main reasons as stated by (Jannah, Fadiawati, & Tania, 2017), namely (1) it can be used anytime and anywhere, (2) wide coverage, and (3) integrated with other systems.

The use of Android as a learning media can be an alternative as well as a solution to make students more active in the learning process. The more active students will affect the learning outcomes. Thus, a Digital Book or E-Pocket Book is a renewal of a traditional book into a digital book with a combination of several media and with an attractive design without compromising its usefulness. Therefore, development research will be carried out on the Development of a HOTS (Higher Order Thinking Skill) -Based Biology Pocket Book to Improve Biology Literacy Skills for High School Students.

RESEARCH METHOD

This type of learning media research was in the form of an E-Pocket Book using research and development method. Research and Development (R&D) is a series of processes or steps in order to develop a new product or improve existing products so that they are accountable (Sugiyono, 2019). The research carried out was the Development of E-Pocket Book Learning Media. Need Assessment data retrieval was carried out in the odd semester of 2020/2021 by using a questionnaire filling technique through Google Forms given to high school Biology teachers. Need Assessment data were used to find out the problems and needs that exist in school. The results of the Need Assessment data were used as the development of the E-Pocket Book learning media.

RESULT AND DISCUSSION

1. Need Assessment

The results of the distribution of observation sheets given to 10 high school biology teachers showed the following results:

Table 1. Obtained Need Assessment

Criteria	Percentage
Power-point Media	80%
Teacher's knowledge of the HOTS process	90%
Teacher's knowledge of HOTS material	80%
Teacher's knowledge of E-Pocket Book Media	50%
Agree to Media Deployment	100%

Based on the criteria and percentage, teachers who used power point and video media were 80%, for teacher's knowledge of the HOTS process in learning were 90%, for teacher's knowledge of HOTS material in learning were 80%, and teachers' knowledge of

E-Pocket Book media got 50%. Therefore, 100% of teachers agreed to implement the E-Pocket Book learning media for students, and 100% of teachers agreed to develop learning media that can improve students' Biological literacy skills.

2. Learning Media Development Results

Teachers' knowledge of E-Pocket Book media gained 50% data and therefore 100% of teachers agreed to implement the E-Pocket Book learning media for students, and 100% of teachers agreed to develop learning media that can improve students' Biological literacy skills. The results of the need assessment showed that the teachers did not fully know how the process and materials in HOTS are. Teachers still did not use E-Pocket Book media because for daily learning, they still use power point and video media only. According to Alwan (2014) E-Pocket Books or often called E-Books (Electronic Books) in the world of education are publications in the form of text and images in digital form that are produced, published, and can be read through computers or other digital tools.

According (Jannah et al., 2017) Digital books are evidence of the development of advanced technology which is expected to develop from time to time to renew traditional paper books for a prospective future. The development of this digital book includes: a) It is easy to carry because it is in the form of a soft copy that can be used by readers in portable electronics, b) It is not heavy, the digital book only needs to be put in a folder inside the portable electronics, so that only portable digital devices are brought, c.) Easy to duplicate, easy to copy digital books for free, so it will save costs and will support learning needs, d) Save paper, in the era of global warming means that we have supported go green which is still being carried out today (Yusnimar, 2014).

CONCLUSION

The learning media used in several schools shows less, therefore the development of the E-Pocket Book media can provide additional media during learning. In the E-Pocket Book media there are questions and pictures based on Higher Order Thinking Skills (HOTS) that can improve the biological literacy skills of high school students.

REFERENCES

- Andrian, Yusuf, & Rusman, Rusman. (2019). Implementasi pembelajaran abad 21 dalam kurikulum 2013. *Jurnal Penelitian Ilmu Pendidikan*, 12(1), 14–23.
- Celik, Suat. (2014). Chemical literacy levels of science and mathematics teacher candidates. *Australian Journal of Teacher Education*, 39(1), 1–15.
- Heong, Yee Mei, Othman, Widad Binti, Yunos, Jailani Bin Md, Kiong, Tee Tze, Hassan, Razali Bin, & Mohamad, Mimi Mohaffyza Binti. (2011). The level of marzano higher order thinking skills among technical education students. *International Journal of Social Science and Humanity*, 1(2), 121.
- Ibnu, Suhadi, & Rahayu, Sri. (2020). The effectiveness of new inquiry-based learning (NIBL) for improving multiple higher-order thinking skills (M-HOTS) of prospective chemistry teachers. *The Effectiveness of New Inquiry-Based Learning (NIBL) for Improving Multiple Higher-Order Thinking Skills (M-HOTS) of Prospective Chemistry Teachers*, 9(3), 1309–1325.
- Jannah, Naimatil, Fadiawati, Noor, & Tania, Lisa. (2017). Pengembangan E-book

- Interaktif Berbasis Fenomena Kehidupan Sehari-hari tentang Pemisahan Campuran. *Jurnal Pendidikan Dan Pembelajaran Kimia*, 6(1), 186–198.
- Muyaroah, Siti, & Fajartia, Mega. (2017). Pengembangan Media Pembelajaran Berbasis Android dengan menggunakan Aplikasi Adobe Flash CS 6 pada Mata Pelajaran Biologi. *Innovative Journal of Curriculum and Educational Technology*, 6(2), 22–26.
- OECD, PISA. (2019). *Results (Volume I): What Students Know and Can Do, PISA*. OECD Publishing, Paris.
- Roberts, Douglas A. (2013). Scientific literacy/science literacy. In *Handbook of research on science education* (pp. 743–794). Routledge.
- Sugiyono, Prof. Dr. (2019). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Susilo, Eko Firman, Adisaputera, Abdurrahman, & Lubis, Malan. (2019). The Ability to Understand Questions of Writing Scientific Works based on Higher Order Thinking Skill (HOTS) in SMAN 3 Medan. *Budapest International Research and Critics in Linguistics and Education (BirLE) Journal*, 2(2), 360–371.
- Turnip, Noni Dynawati, & Hasruddin, Hasruddin. (2018). Analisis pemahaman konsep siswa materi archaeobacteria dan eubacteria. *Jurnal Pelita Pendidikan*, 6(4).
- Yaumi, Dr Muhammad. (2018). *Media and Learning Technology*. Jakarta: PRANADAMEDIA GROUP.
- Yuniar, Maharani, Rakhmat, Cece Rakhmat, & Saepulrohman, Asep. (2015). Analisis HOTS (High Order Thinking Skills) pada soal objektif tes dalam mata pelajaran ilmu pengetahuan sosial (Ips) Kelas V SD Negeri 7 Ciamis. *PEDADIDAKTIKA: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, 2(2), 187–195.
- Yusnimar, Yusnimar. (2014). E-book dan pengguna perpustakaan perguruan tinggi di Jakarta. *Al Maktabah*, 13(1).