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LITERATURE STUDY: IMPLEMENTATION OF CHEMISTRY LEARNING USING BLENDED LEARNING MODEL TO IMPROVE STUDENTS' HOTS (HIGHER ORDER THINKING SKILLS)

BADRUS SYAMSI¹, ADE SURYANDA²

^{1,2} FMIPA, Universitas Negeri Jakarta

Email: badrus.syamsi1994@gmail.com

No kontak: 081328293094

Abstract

This study aims to determine the effect of implementing chemistry learning using the blended learning model in increasing student HOTS. The method used in this research is literature study. The data collection technique used, namely collecting data by finding sources and creating them through primary sources such as books, journals and existing research. The results showed that learning chemistry using a blended learning model could increase students' HOTS. Chemistry learning using a blended learning model can shape students to study individually either in groups, face to face, or online, and to solve problems, identify, interpret, and communicate learning outcomes.

Keywords: *Blended learning, HOTS, Chemistry Learning*

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh implementasi pembelajaran kimia menggunakan model blended learning dalam meningkatkan HOTS siswa. Metode yang digunakan dalam penelitian ini, yaitu studi literatur. Teknik pengumpulan data yang digunakan, yaitu mengumpulkan data dengan cara mencari sumber dan mengkreasiannya melalui sumber primer seperti buku, jurnal dan penelitian yang ada. Hasil penelitian menunjukkan bahwa pembelajaran kimia menggunakan model blended learning dapat meningkatkan HOTS siswa. pembelajaran kimia menggunakan model blended learning dapat membentuk siswa untuk belajar secara individu baik dalam kelompok, tatap muka, atau *online*, dan untuk memecahkan masalah, mengidentifikasi, menginterpretasikan, dan mengkomunikasikan hasil belajar.

Kata Kunci: Blended learning, HOTS, Pembelajaran Kimia

INTRODUCTION

The process of learning chemistry requires direct analysis and observation, which usually necessitates face-to-face interactions between teachers and students to facilitate better understanding of the subject matter. However, the outbreak of the pandemic has brought about significant changes in the learning process, leading the government to implement online learning concepts (Panambaian, 2020). Some teachers have encountered challenges in teaching and learning through online platforms (Ariesca et al., 2021). Therefore, efforts to improve HOTS become a challenge if not combined with an appropriate learning model. One of the learning models that can be used is the blended learning model. In this learning process model, a platform/media/application is needed. Some media that can be used are Edmodo and Moodle. The platform can be accessed by teachers and students via the internet. Several features that



support the learning process include discussion forums, learning resources, quizzes, assignments, academic information, and student data management. With these features, teachers and students can easily facilitate the learning process.

Blended learning is one of the learning systems that can face the challenges of the Industry 4.0 revolution and produce generations capable of critical thinking and being active in the future (Masitoh et al., 2018). This learning approach makes students more active and independent in the learning process in the classroom. The blended learning model can also be applied by delivering learning materials anywhere and anytime, thus making learning more effective and efficient, increasing accessibility, and making learning more flexible and not rigid (Susatyo & Damanik, 2021).

Based on this background, the researcher conducted a literature review on the implementation of chemistry learning using the blended learning method to improve students' HOTS.

RESEARCH METHOD

This research method utilizes a literature review (Afsari et al., 2021; Thovawira et al., 2020). The data collection technique used is based on various primary sources, such as books, journals, and previous research studies. A total of 15 articles were used as literature sources obtained from various references and analyzed thoroughly to support the research plan and ideas.

RESULTS AND DISCUSSION

The aim of this literature review study is to determine the implementation of blended learning in chemistry education, the process of its implementation, and the media used to enhance higher-order thinking skills (HOTS) among students.

The results of the literature review show that the implementation of blended learning in chemistry education can enhance students' HOTS. This is in line with the findings of Yustiqvar et al. (2019), which proved that there was an increase in students' learning outcomes in chemistry education through interactive multimedia with a high N-gain score. Another study by Arizaga et al. (2016) also proved that their findings could enhance students' HOTS from problem-solving skills, critical thinking skills, and an improvement in communication and literacy skills.

Rahmansyah & Yudha (2016) explain that blended learning is a learning model that enables students to absorb knowledge as much as possible through the lessons given, so that students' HOTS can be improved. Then, Ikhwani (2017) states that learning with blended learning using interactive



multimedia becomes an important platform for students to understand learning materials by improving students' HOTS.

The use of platforms such as Edmodo (Paramita et al., 2017), Moodle (Mahardika et al., 2019), or e-course learning (Manggabarani et al., 2016), in the chemistry learning process can be used to improve students' thinking skills. In addition, in its implementation, chemistry learning with blended learning models requires planning in the form of complete learning tools, so that the learning process can take place effectively and achieve the desired results. Murniati and Sanjaya (2013) through their research explained that the development of blended learning model learning tools must be applied to facilitate students in facing online and offline learning. Learning tools that must be equipped are lesson plans, student worksheets or workbooks, and learning media. In implementing blended learning models, the lesson plan must be made complex by integrating online and offline learning systems into a learning model that is appropriate for chemistry learning materials (Wulandari & Dwiningsih, 2017).

Paramita et al. (2017) have implemented blended learning models using the Edmodo platform, and the results of their research show that student motivation and activity are in the good category with a percentage of 78%, while student responses to the interaction aspect of using Edmodo itself are in the very good criteria with a percentage of 85%.

The application of learning media using different platforms has been conducted by Mahardika et al. (2019) on the topic of atomic structure, using the Moodle platform. The research results showed an improvement in students' learning outcomes. Through engaging content, students found it easier to understand abstract chemical concepts, leading to a more engaging learning environment, and students were able to improve their learning outcomes through provided Higher Order Thinking Skills (HOTS) questions (Mahardika et al., 2019). Similar results were found by Sandi (2012) in a study on the topic of hydrocarbons, which showed that students who participated in blended learning using Moodle had better learning outcomes (with an average score of 85.4) than those who received traditional face-to-face learning (with an average score of 72.9). Hendra and Siagian (2014) also stated that using Moodle as an interactive learning tool can enhance students' HOTS compared to traditional learning media.

In addition to interactive multimedia platforms such as Edmodo and Moodle, web-based and e-learning-based learning can also be linked to the implementation of blended learning. Through their findings, Manggabarani et al. (2016) implemented blended learning using a web-based learning model to enable students to learn independently with various appropriate approaches so that they can direct, motivate, and manage their own learning. Similar research was conducted by Astriyanti et al. (2017) on the topic of redox reactions, which showed an improvement in students' basic competencies through e-



learning post-tests and task submissions, leading to better HOTS among students (Safitri et al., 2019; Safitri & Hasibuan, 2018a, 2018b).

CONCLUSION

Based on the literature obtained, it can be concluded that the implementation of blended learning can attract students' interest in learning chemistry by combining various information technology and technology-based educational media, such as interactive learning platforms named Edmodo, Moodle, websites, and other electronic learning tools. Blended learning enables students to engage in individual and group learning to solve problems, identify, interpret, and understand learning outcomes, thereby improving their higher-order thinking skills.

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