

LECTURER AND STUDENT PERSPECTIVES IN DEVELOPING ELECTRONIC STUDENT WORKSHEETS BASED ON A STEM APPROACH USING MACROMOLECULAR MATERIAL

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Abstract

The use of technology-based worksheets really helps students in learning. Student worksheets that can develop students' 21st century skills can be integrated with a STEM approach. This research aims to see the response of students and lecturers to the development of Electronic Student Worksheets based on the STEM (Science Technology Engineering and Mathematics) approach to macromolecular materials. Student worksheets were developed using the Kvisoft Flipbook Maker application. This research uses a descriptive method with a user response questionnaire technique using a Likert scale. The results of the student response test were 92% in the interesting category. Meanwhile, the results of lecturers' responses showed that 86% were in the interesting category. This is interesting because the student worksheets are designed to be integrated with a STEM approach which directs students to innovate in solving problems found in everyday life according to the material provided.

Keywords: Kvisoft Flipbook Maker, Macromolecules, Student worksheets

INTRODUCTION

Chemistry learning aims to study matter, including its characteristics, properties, structure, changes, mechanics and energy, requiring skills and reasoning. In chemistry learning, chemical characteristics such as setting, process, and product must be considered by educators to help select learning media and resources for students (Mufidah et al., 2021). The use of teaching materials that are less varied and monotonous cannot make students active in the learning process, which will result in students not understanding material that contains macromolecules. Educators can try to maximize learning opportunities and media. Educators now need to be creative in comparing learning models and media (Wijaya, 2020). Therefore, a variety of teaching materials are needed, especially macromolecular material. Teaching materials that are often developed for learning are student notebooks and worksheets. STEM-based Student Worksheet (Science (S), Technology (T), Engineering (E), and Mathematics (M)) (Ma'sumah & Mitarlis, 2021).

STEM is a learning approach that combines science, technology, engineering and mathematics in learning activities that are oriented towards solving everyday problems (Davidi et al., 2021). The goal of STEM programs in education is to equip

students to be competitive and work in their chosen fields (Puspitasari et al., 2021). STEM-based learning is implemented to strengthen critical and creative thinking skills that are logical, innovative, productive, and directly related to real world situations (Widya & Laila Rahmi, 2019). Developing STEM-based materials is important because it teaches students problem solving in accordance with the curriculum and student characteristics (Wahyuni et al., 2022). With an attractive appearance and contextual content, LKM is expected to support the learning process because it can stimulate students' interest in learning (Nengsi et al., 2021). One way is to use e-LKM with the help of the Kvisoft Flipbook Maker application (Zuliatin et al., 2022).

Kvisoft Flipbook Maker is an application for creating electronic teaching materials such as books, modules, which can be created by inserting images, graphics and links. According Nazeri (2013) Flipbooks help students better master abstract material and events that cannot be presented in class. Kvisoft Flipbook Maker has several advantages, such as being able to present learning material in the form of words, sentences and images, equipped with colors to attract students' attention, easy to create, cheap, simple and easy. Students can take it anywhere and increase learning activities (Susilana & Riyana, 2008). Apart from the attractive appearance of teaching materials, teaching materials must also be created using a learning model that suits the characteristics of the material. Based on the description previously provided, researchers are interested in seeing user responses from both lecturers and students regarding the development of student worksheets based on the macromolecular material stem approach using Kvisoft flipbook maker.

METHOD

The research method used is descriptive. Data collected with Anget. The survey method used was questions regarding instructor and student reactions to the development of student worksheets using Kvisoft Flipbook Maker. Analyze survey data created using a Likert scale (Sugiyono, 2017). The lecturer response questionnaire assessment was carried out by 2 lecturers and 10 chemistry education students to measure the practicality of using the product with the formula:

$$P = \frac{n}{N} \times 100\%$$

Next, the percentage results are converted into quantitative values as presented in Table 3.

Table 3. Product Attractiveness Criteria (Sa'ud & Sriwiyana, 2010)

Percentage	Qualifying
80%-100%	Interesting
60%-79%	Quite interesting
50%-59%	Less attractive
< 49%	Not attractive

FINDINGS AND DISCUSSION

The user response results obtained are relevant to Irfandi & Murwindra (2022b) research that user responses when developing technology-based teaching materials were very good. According Putri & Susanti (2021) Learning tools are said to be

interesting and practical when they do not cause obstacles or problems in their use by educators and students. Besides that Khamdun et al (2021) A learning tool is said to be interesting and practical because the language used in the media is easy to understand and communicative so that users respond positively to the learning carried out. Apart from that, the arrangement of media is in accordance with the allocation of learning time. There are also several obstacles in this development, including the lack of innovation and creativity in designing student worksheets. This is relevant to research Irfandi & Murwindra (2022) One of the obstacles in developing multimedia-based devices is media design creativity.

Interesting learning makes students more motivated and able to accept the material easily. Student response is a reaction made by students when making a contribution or response to a situation carried out by someone else (Maharani & Widhiasih, 2016). Lecturers really need to analyze student responses in learning activities. Educators must understand the level and way of thinking of students so that they can direct students to become the individuals needed in the world of work and industry. Apart from that, according to research by Zahara et al (2020), material combined with a STEM approach can increase students' curiosity and enthusiasm for learning to become innovators. The use of technology-based teaching materials can not only make students understand the material but also student communication (Erna et al., 2021). Students really need technology-based teaching materials like this, such as kvisoft flipbook maker (Rini et al., 2023). The use of technology-based teaching materials can not only be used in class but can also be used effectively during online learning (Murwindra et al., 2023).

CONCLUSION

Based on the research results and discussions that have been described, the e-LKM product based on a STEM approach on hydrocarbon materials using the Kvisoft Flipbook Maker application was declared suitable for use and tested for user responses by lecturers and students. They meet excellent standards with rates of 87% and 90% respectively

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