Eduproxima: Jurnal Ilmiah Pendidikan IPA
http://jurnal.stkippgritulungagung.ac.id/index.php/eduproxima

MEASURING THE USER EXPERIENCE OF INTERACTIVE E-MODULES BASED ON SOMATIC, AUDITORY, VISUAL, INTELLECTUAL ON LIGHT MATERIAL

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Received: June 26th, 2023; Revised: July 22th, 2023; Accepted: Aug. 28th, 2023; Published: January 04th, 2024

ABSTRACT

This study aims to evaluate the use of interactive e-modules based on Somatic, Auditory, Visual, Intellectual (SAVI) in the learning process with light material. Several multimedia aspects are presented in this interactive e-module (such as video, sound, picture, etc.). To collect relevant information, this descriptive research involved 27 students grade 8 from a State Islamic Junior High School in Kediri. A valid and reliable User Experience Questionnaire (UEQ) was use to examine students' experience while using SAVI-based interactive e-module. The SAVI-based interactive e-modules received good responses for each user experience questionnaire indicator. The good response from the students showed that the SAVI-based interactive e-modules was good to use in learning process.

Keywords: UEQ; interactive e-module; SAVI approach; light material

INTRODUCTION

One of the innovations in teaching materials that utilize technology is interactive e-modules. Interactive e-modules are teaching materials that combine several interactive multimedia aspects (audio, video, text, graphics, etc) to control an order (Aryawan et al., 2018). Many interactive e-modules have been developed, but some interactive e-modules are less "interactive" due to the lack of reciprocity between teaching materials and users. The features provided by software that is commonly used are less interactive, such as the features found in the *Flip Pdf Professional* and *Flip Builder Corporation software*. Therefore, the use of software that supports interactive feture ini e-modules is very important. One of the software that provides a more interactive feature, namely the *Smart Apps Creator* (SAC) (Amin et al., 2022).

The multimedia aspect of interactive e-modules is useful for fostering creativity, effectiveness, and motivation in learning activities to improve the quality of education (Sugiarto, 2018). This is supported by the multimedia learning theory explained by Mayer (2009), the principle of multimedia learning, that is, students learn better with words and Pictures than with words alone. The dual-channels theory assumption by Paivio (2014) is an assumption of the cognitive theory of multimedia learning, which describes humans as having two information processing systems, namely the verbal system and the visual system. The assumption of limited capacity by

Baddeley (2007) is also an assumption of the cognitive theory of multimedia learning, which describes humans as having the capacity to process information at one time. It can be concluded that it is important to combine images/visuals and words/verbals in learning. Although the use of interactive e-modules has a positive impact. However, there are problems, such as schools rarely using interactive e-modules in the implementation of learning (Saprudin et al., 2022; Sembiring, 2022).

Similar facts can also be seen at State Islamic Junior Highschool in Kediri, the teaching materials used in the learning process still use textbooks provided by the school and the learning strategy that is usually used by teachers in learning is the lecture method, so it is less interesting for students to read and learn. The results of the questionnaire given to students also showed that all students admitted that learning science usually still used textbooks as teaching materials and 59% of students said they had video media from YouTube as a learning medium. State Islamic Junior Highschool in Kediri has several facilities that can support science learning including Smart TV, LCD, Science Laboratory, and Computer Laboratory. However, in its use, it is not optimal for reasons of time constraints.

The results of the questionnaire also stated that students have different learning styles. 48% of students like the learning style of doing something (Somatic). 63% of students like learning styles by listening and speaking (Auditory). 70% of students like learning styles by seeing and describing (Visual). 67% of students like learning styles by finding solutions to problems and reflecting (Intellectual). This makes it necessary to use an appropriate learning approach to combine the learning styles of students. One of them is the Somatic, Auditory, Visual, Intellectual (SAVI) approach.

The Somatic, Auditory, Visual, Intellectual (SAVI) learning approach is an approach that utilizes all the senses of students in learning (Aneilla et al., 2023). The Somatic, Auditory, Visual, Intellectual (SAVI) learning approach can make the learning atmosphere better, more interesting, and more effective, to awaken the full intelligence of students through the combination of physical movement and intellectual activity, maximizing the sharpness of students' concentration, and arousing creativity and psychomotor abilities of students (Meier, 2000).

Based on the results of pre-research with science teachers and students, it is known that the expectations of science teachers and students for science learning are the application of more interesting teaching materials. These teaching materials are expected to play an important role in supporting the learning process and students can more easily accept learning, especially in light material. The choice of light material is because this material itself is quite complicated. After all, it emphasizes conceptual and mathematical understanding (Ainiyah et al., 2020). In addition, there are different approaches to interpreting the nature of light. The propagation of light is better explained by approaching light as a wave but understanding emission and absorption in the light requires an approach to light as a particle (Young et al., 2020).

The use of SAVI-based interactive e-modules using SAC software in learning light material is very important. However, limited studies focused on measuring UEQ on SAVI-based interactive e-modules

using SAC software. Therefore, this study investigated user experience of implementing SAVI-based interactive e-modules with SAC software, especially in light science learning materials. By performing measurement, researchers can formally formulate the needs of system development and improvement (Santoso et al., 2016).

Measuring user experience typically requires collecting feedback of a larger group of users. This can be done most efficiently with questionnaires, especially if such questionnaires are used as an online tool (Santoso et al., 2016). There are many kinds of user experience research frameworks in the market. All of them have their own purposes for use as well as advantages and disadvantages. This study used User Experince Questionnaire (UEQ). The UEQ provides a comprehensive impression of user experience, ranging from classical usability aspects to user experience aspect (Santoso et al., 2016).

The main goal of the User Experience Questionnaire (UEQ) is to allow a fast and immediate measurement of user experience of interactive products (Schrepp, 2023). UEQ has already been applied in a variety of research contexts, for example for the evaluation of business software, learning management system, etc. (Laugwitz et al., 2008; Santoso et al., 2016).

METHOD

This study used descriptive research and involved 27 students in grade 8 from a state Islamic Junior High School in Kediri. This SAVI-based interactive e-modules is suitable for use based on validation results, it includes learning materials, simulations, articles, and formative assessments. The interactive e-modules that use in the learning process has SAVI aspects as follows.

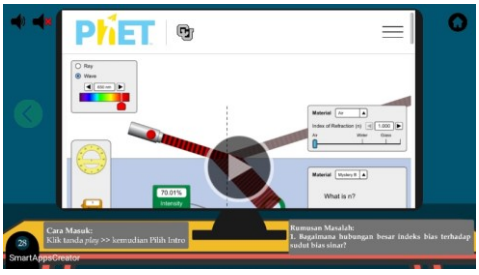

Figure 1 Somatic Aspect

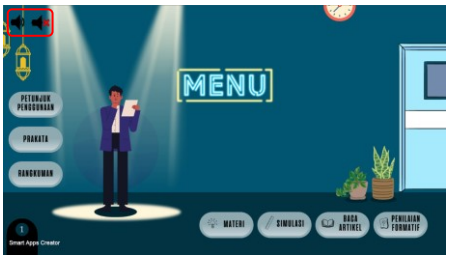

Figure 2 Auditory Aspect

Figure 3 Visual Aspect

Figure 4 Intellectual Aspect

This study collected information using UEQ sheet. The UEQ contains 26 items which is divided into 6 indicators, such as:

1. Attractiveness: General impression towards the product.
2. Efficiency: Is it possible to use the product fast and efficiently?
3. Perspicuity: Is it easy to understand how to use the product?
4. Dependability: Does the user feel in control of the interaction?
5. Stimulation: Is it interesting and exciting to use the product?
6. Novelty: Is the design of the product innovative and creative?

The reliability of the UEQ sheets has an Alpha-Cronbach value between 0.58-0.81 in the "enough" category and the validity of the UEQ is categorized as "good" (Santoso et al., 2016).

The statement items in the UEQ sheet use a semantic differential form, the form of a pair of contradictory statements (such as good/bad). Half of the statements on the response sheet begin with positive statements, and the other half with negative statements (in random order) (Schrepp et al., 2017). The rating scale used in the student's response sheet uses a seven-stage Likert scale, from -3 to +3.

The -3 scale value indicates the most negative answer, 0 is neutral, and +3 is the most positive answer. A scale value above +1 indicates a positive impression and a scale value below -1 indicates a negative impression (Santoso et al., 2016). The use of this type of scale is intended to reduce central tendency bias (Schrepp, 2023). Sample items of the questionnaire can be found on Table 1.

Table 1 The User Experience Questionnaire Items (English Version)

annoying	○	○	○	○	○	○	○	enjoyable	1
not understandable	○	○	○	○	○	○	○	understandable	2
creative	○	○	○	○	○	○	○	dull	3
easy to learn	○	○	○	○	○	○	○	difficult to learn	4
valuable	○	○	○	○	○	○	○	inferior	5
boring	○	○	○	○	○	○	○	exciting	6
not interesting	○	○	○	○	○	○	○	interesting	7
unpredictable	○	○	○	○	○	○	○	predictable	8
fast	○	○	○	○	○	○	○	slow	9
inventive	○	○	○	○	○	○	○	conventional	10
obstructive	○	○	○	○	○	○	○	supportive	11
good	○	○	○	○	○	○	○	bad	12
complicated	○	○	○	○	○	○	○	easy	13
unlikable	○	○	○	○	○	○	○	pleasing	14
usual	○	○	○	○	○	○	○	leading edge	15
unpleasant	○	○	○	○	○	○	○	pleasant	16
secure	○	○	○	○	○	○	○	not secure	17
motivating	○	○	○	○	○	○	○	demotivating	18
meets expectations	○	○	○	○	○	○	○	does not meet expectations	19
inefficient	○	○	○	○	○	○	○	efficient	20
clear	○	○	○	○	○	○	○	confusing	21
impractical	○	○	○	○	○	○	○	practical	22
organized	○	○	○	○	○	○	○	cluttered	23
attractive	○	○	○	○	○	○	○	unattractive	24
friendly	○	○	○	○	○	○	○	unfriendly	25
conservative	○	○	○	○	○	○	○	innovative	26

Data analysis techniques from students' experience will be analyzed using descriptive statistics by calculating the mean or average per indicator. The average of each UEQ indicator will show how the results of students' experience. Then it is interpreted using the criteria proposed by Schrepp (2023) which are presented in Table 2.

Table 2 Data Interpretation

The mean per indicator	**Criteria**
> 0,8	Good
-0,8 until 0,8	Neutral
< -0,8	Bad

RESULTS AND DISCUSSION

The results of students' experience regarding the use of SAVI-based interactive e-modules were obtained from filling out the questionnaire given after the lesson was done. Students' experience data is presented in Figure 5.

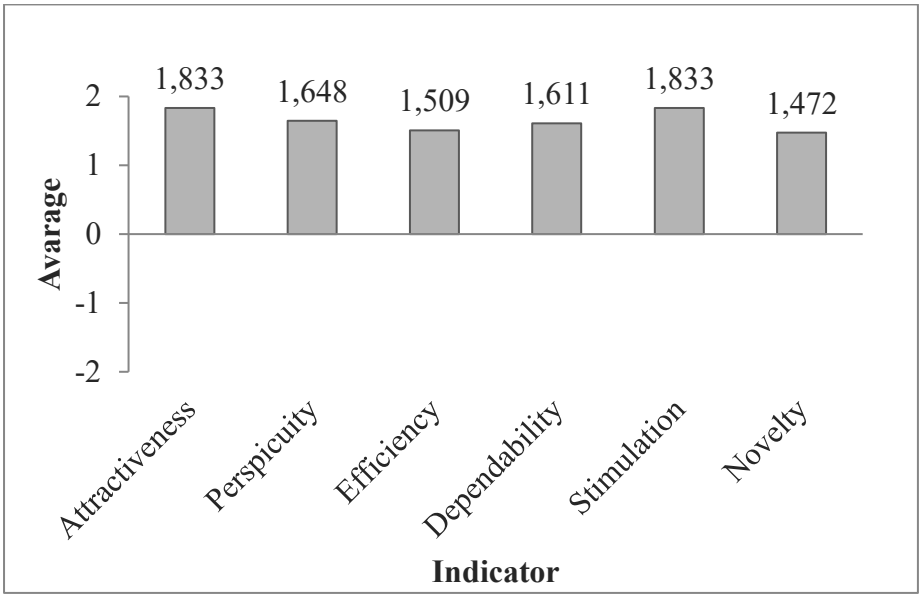

Figure 5 Mean Per UEQ Indicator

Based on Figure 6 it is known that for each indicator, the average value of student answers is more than 0.8. According to Schrepp (2023), an average response value of >0.8 indicates a "good" or positive response criteria. Based on this results, each students' experience has a good response to the use of SAVI-based interactive e-modules. This is following Aeni & Widodo's research (2022) which shows a good response from students towards learning using interactive e-modules with the Smart Apps Creator software. The same thing can be seen from the research by Agustin et al. (2019) which stated that students' responses to the interactive science e-book used in learning showed a good response.

The highest average students' response value is found in the attractiveness and stimulation indicators, which get an average answer of 1.8. This result is because, in the interactive e-modules, there are pictures, videos, and simulations so that learning is more interesting and can increase students' learning enthusiasm. This is according to research by Aeni & Widodo (2022) which shows that the use of interactive e-modules that contain images, text, and also videos makes students very enthusiastic about learning. As well as research by Mahardika et al. (2022) showed that learning science using PhET simulations resulted in students' enthusiasm for learning to increase. This is also supported by Nguyen & Tuamsuk's research (2022) which states that multimedia aspects in learning can improve the quality of student learning.

The lowest average student response value is found in the novelty

indicator, which gets an average answer value of 1.4. In one of the statements on the indicator of novelty, students answered more conventionally than inventively. This is because learning using interactive e-modules still requires LKPD sheets which are not accommodated in interactive e-modules. Based on the results of several studies show a tendency for the recency indicator to also have the lowest average compared to other indicators (Pandu & Fajar, 2019; Sabukunze & Arakaza, 2021; Santoso et al., 2016).

Even though there are some lack in this interactive e-modules when viewed from the responses of students. However, overall, students have a good response to the implementation of SAVI-based interactive e-modules in learning. This is following research conducted by Pradana et al. (2020) learning by using interactive multimedia received a positive response from students, due to the attractive display design and its beneficial use to hone students' understanding. According to the theory of Mayer et al. (2009), good multimedia learning must meet instructional design principles such as clarity of material so that it is easy to understand, the use of well-organized words and images, the use of conversational language so that it is user-friendly, and so on. This means, from the results of student responses it is known that SAVI-based interactive e-modules can be said to be good.

CONCLUSION

Based on research data and discussion of the implementation SAVI-based interactive e-modules, it can be concluded that the results of students' experience received good responses for each user experience questionnaire indicator, including the attractiveness indicator having an average of 1,833, the perspicuity indicator has an average of 1,648, the efficiency indicator has an average of 1,509, the dependability indicator has an average of 1,611, the stimulation indicator has an average of 1,833, and the novelty indicator has an average of 1,472. The good response from the students showed that the SAVI-based interactive e-modules was good to use in learning process.

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