

Usefulness of E-module Based on Experiential Learning in Physics Learning

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Abstract— Education is defined as a process using certain methods to produce knowledge. The era of the industrial revolution 4.0 has an impact on education, namely learning is influenced by technology. Generations that are influenced by technological developments are called digital natives. Digital native characteristics have an influence on the learning of students, where technology cannot be separated from their lives. So that we need teaching materials that can facilitate the learning characteristics of the digital native generation, namely teaching materials based interactive multimedia, such as e-modules. The aim of this study was to determine the usefulness level of e-module based on experiential learning in physics learning. This type of research is Research and Development (R&D). The method used is descriptive method with data collection instruments, namely the e-module usefulness questionnaire assessed by the teacher. The results showed that experiential learning-based e-modules were very useful in learning physics.

Keywords—Usefulness; E-module; Experiential Learning; Physics Learning.

I. INTRODUCTION

Education is an effort taken to be able to educate the nation's life. For this reason, Law No. 20 of 2003 concerning National Education was enacted in order to build a democratic, decentralized, and autonomous education that can uphold human rights [1]. In order to achieve educational goals, one of the efforts that can be made by the government is to improve the curriculum. Completion of the curriculum must follow the developments and changes of the times [2]. This is done so that human resources (HR) in Indonesia can compete globally with other countries.

The implementation of the curriculum can be seen in learning in schools, both primary and secondary schools. The essence of learning is a two-way communication process between teachers and students through media or certain teaching materials [3]. Learning must be able to involve students to be active, in order to explore and explore the potential that exists within them [4]. For this reason, the creativity of the teacher as a facilitator for students is needed.

In the era of the industrial revolution 4.0, there were technological developments that had an impact on the ease of accessing information. The very rapid development of technology allows information originating from the real world to be copied into virtual form [5]. The development of technology also has an impact on the field of education, where student learning is often referred to as digital native which is different from the learning of students in the previous era [6]. Characteristics of digital native, namely being

able to perform various activities at once and accustomed to skipping cognitive structures [7]. The digital native generation is technology, flexible, smarter, and tolerant of cultural differences [8]. For digital natives, technology cannot be separated from their lives. It can be seen from the use of computers, digital music players, the use of smartphones and various other digital devices in filling their lives [9].

These special naive digital characteristics will have an impact on the learning styles of students. This generation is more interested in teaching materials that can be accessed through digital devices. Thus, teachers are challenged to literacy terhadap p change learners' learning style that is almost entirely a digital native generation. The teacher has an important role in learning, the success or failure of learning depends on the activities and creativity of the teacher in realizing learning, such as being able to develop teaching materials that are in accordance with digital native characteristics.

One of the teaching materials that can facilitate the learning characteristics of the digital native generation is interactive multimedia-based teaching materials, such as e-modules. E-module is a form of independent teaching materials that are systematically arranged in the learning section presented in an electronic format [10]. E-modules are essentially the same as print modules, which are planned learning programs to help students achieve their learning goals [11]. The use of e-modules in learning can be a solution to the monotonous shortage of teaching materials in schools [12]. The e-module in this study uses an experiential learning model.

Experiential learning model is a learning model that activates students in constructing or arranging knowledge, skills, and values through direct experience so that learning is meaningful. Experiential learning model is learning in which knowledge is created through the transformation of experiences [13]. Learning based on the experience of students can make students able to guide themselves and develop critical thinking [14; 15].

Experiential learning-based e-module used in physics learning is a practical e-module. E-modules are said to be practical if e-modules are easy to use in learning [16]. Therefore, this study discusses the usefulness of e-module based on experiential learning in learning physics.

II. METHODS

The type of research used is research and development (R&D). The development of e-modules uses the Plomp model which consists of three stages, namely *preliminary research, development or prototyping phase*, and *assessment phase* (Plomp, 2013). The practicality test is part of the Plomp model phase, namely the *development or prototyping phase*. The instrument used to collect data was the teacher's usefulness sheet.

This research was conducted in July-August 2019. Usability analysis uses a Likert scale with usability values determined using the formula:

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

Information:

P = usefulness value

f = earned score

N = maximum score

The usability value interpretation is based on Table 1.

Table 1. Usefulness Category

No.	Value	Category
1	$81\% \leq x \leq 100\%$	Very useful
2	$61\% \leq x \leq 80\%$	Useful
3	$41\% \leq x \leq 60\%$	Quite useful
4	$21\% \leq x \leq 40\%$	Less useful
5	$0\% \leq x \leq 20\%$	Not useful

Source: [17]

III. RESULT AND DISCUSSION

The data obtained in this study were useful data on the e-module based on experiential learning which was assessed by two physics teachers at SMAN 2 Padang. The usefulness assessment consists of four components, namely ease of use, attractiveness, efficiency of learning time, and usability. The results of the usefulness test analysis of the e-module ease of use can be seen in Figure 1.

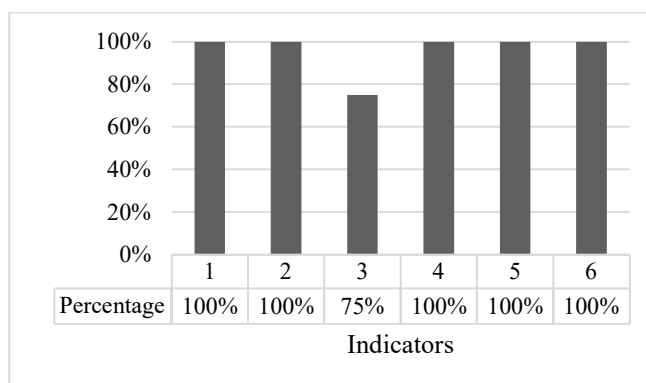


Figure 1. Ease of use component

Figure 1 is the result of usefulness test analysis for ease of using e-module. The indicators contained in the ease of use of the e-module consist of six indicators. The first indicator is that the material presented in the e-module is clear with a usefulness value of 100% which is in very useful category. The second indicator is the material presented in a simple e-module with a usefulness value of 100% on very useful category. The third indicator is that the teacher easily understands the contents of the e-module as a whole with a usefulness value of 75% with useful category. The fourth indicator is that the teacher can clearly see the letters used in the e-module with a usefulness value of 100 with very useful category. The fifth indicator is that the teacher is easy to read the letters used in the e-module with a usefulness value of 100% with very useful category. The sixth indicator is that the teacher easily understands the language used in the e-module with a usefulness value of 100% with very useful category.

Based on Figure 1, it can be concluded that the usefulness of the ease of use component is in the very useful category with an average of 96%.

The second component in the usefulness assessment is attractiveness, where the usefulness test results can be seen in Figure 2.

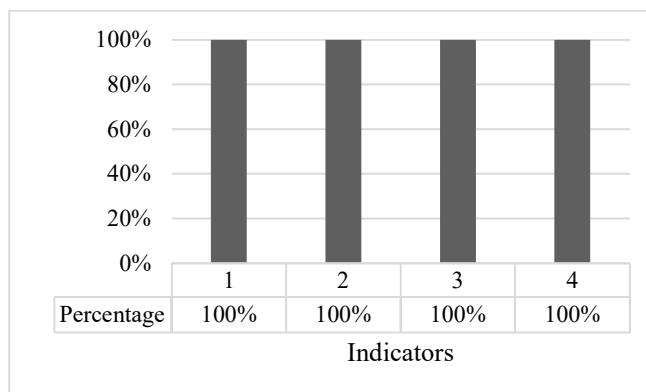


Figure 2. Attractiveness component

Figure 2 shows the results of the usefulness analysis test for the component of attraction which consists of four indicators. The first indicator, namely the pictures in the e-module, can motivate teachers to understand the material. The second indicator, namely the video in the e-module, can motivate teachers to understand the material. The third indicator, namely the reading in the e-module, can motivate teachers to understand the material. The fourth indicator, the e-module, can increase interest in learning. The usefulness value for the four indicators is 100% with very useful category.

Based on Figure 2, it can be concluded that the usefulness of the attractiveness component is in the very useful category with an average of 100%.

The results of the usefulness analysis of the components of the learning time efficiency can be seen in Figure 3.

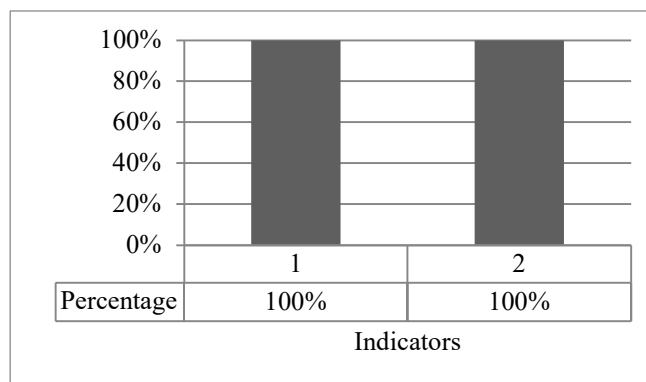


Figure 3. Learning time efficiency component

Figure 3 is the result of usefulness analysis test for the component of learning time efficiency which consists of two indicators. The first indicator is the use of e-modules to make learning more efficient. The second indicator, the e-module, can be used according to the allocation of learning time. The usefulness test value for both indicators is 100% with very useful category.

Based on Figure 3, it can be concluded that the usefulness of the learning time efficiency component is in the very useful category with an average of 100%.

The results of the usefulness test analysis for the usability component can be seen in Figure 4.

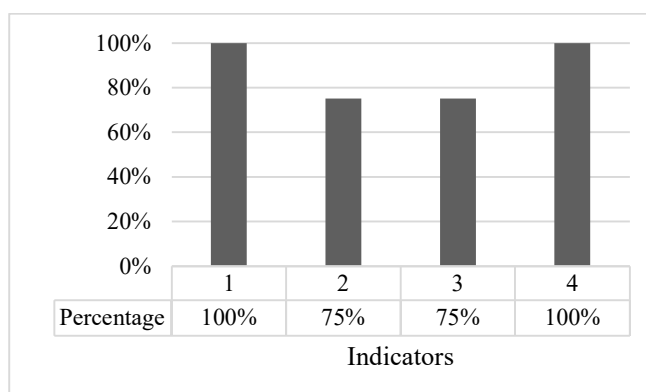


Figure 4. Usability component

Figure 4 is the result of usefulness test analysis for the usability component which consists of four indicators. The first indicator is the e-module supports the role of the teacher as a facilitator with a usefulness value of 100% with very useful category. The second indicator, namely e-module, reduces the workload of the teacher to explain material repeatedly with a usefulness value of 75% with useful category. The third indicator, namely e-module, can help in independent learning with a usefulness value of 75% with useful category. The fourth indicator of e-module can improve the disaster knowledge competence of students with a usefulness value of 100% with very useful category.

Based on Figure 4, it can be concluded that the usefulness of the usability component is very useful category with an average of 88%.

Usefulness level of e-module is a very useful category with an average value of 96%. This is in accordance with the theoretical study that the e-module is useful if it has a percentage of >80%. In addition, e-modules are said to be useful if they have attractiveness, letters and images are easy to understand, and can increase students' independent activities [18].

IV. CONCLUSION

Based on the results and discussion in this study, it is concluded that the e-module based on experiential learning is very useful to use in learning physics in terms of teacher responses.

REFERENCES

- [1] Hakim, Lukmanul. (2017). Analisis Perbedaan Antara Kurikulum KTSP dan Kurikulum 2013. *Jurnal Ilmiah DIDAKTIKA*, 17(2), pp. 280-292.
- [2] Ahmad, Syarwan. (2014). Problematika Kurikulum 2013 dan Kepemimpinan Instruksional Kepala Sekolah. *Jurnal Pencerahan*, 8(2), pp. 98-108.
- [3] Putra, Zonny Amanda, et al. (2018). The Practicality of Learning Module Based on Jigsaw-Cooperative Learning Model in Media Education Course. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, 201, pp. 48-52.
- [4] Rakhmawati, Suci, et al. (2016). Analisis Pelaksanaan Kurikulum 2013 ditinjau dari Standar Proses dalam Pembelajaran Biologi Kelas X di SMA Negeri 1 Krangkeng. *Science Education: Jurnal Sains dan Pendidikan Sains*, 5(2), pp. 156-164.
- [5] Ayu, Fitrah. (2020). Praktikalitas Pengembangan E-book Fisika Berbantuan Edmodo Berbasis Discovery Learning dalam Proses Pembelajaran Fisika. *Jurnal Inovasi Pendidikan dan Sains*, 1(3), pp. 66-71.
- [6] Smaragdina, Azhar Ahmad, et al. (2020). Pelatihan Pemanfaatan dan Pengembangan Bahan Ajar Digital Berbasis Multimedia Interaktif untuk Menghadapi Era Revolusi Industri 4.0. *Jurnal Karinov*, 3(1), pp. 53-57.
- [7] Prensky, M. (2001). Digital Natives, Digital Immigrants. *On the Horizon*, 9(5), pp. 1-6.
- [8] Rastati, Ranny. (2018). Media Literasi Bagi Digital Natives: Perspektif Generasi Z di Jakarta. *Jurnal Teknologi Pendidikan*, 6(1), pp. 60-73.
- [9] Mardina, Riana. (2011). Potensi Digital Natives dalam Representasi Literasi Informasi Multimedia Berbasis Web di Perguruan Tinggi. *Jurnal Pustakawan Indonesia*, 11(1), pp. 5-14.
- [10] Saputra, Rio Rasdian. (2020). Problem Analysis and Requirement of Biology Materials by E-Module Based on Android in SMAN 3 Padang. *International Journal of Progressive Sciences and Technologies (IJPSAT)*, 20(1), pp. 102-108.
- [11] Afifah, Afaf. (2020). Pengembangan E-Module pada Mata Kuliah Kompetensi Pembelajaran di Program Studi Pendidikan Teknik Bangunan, Universitas Negeri Jakarta. *Jurnal Pendidikan Teknik Sipil (JPenSil)*, 9(2), pp. 117-124.
- [12] Purwanto, Agung, et al. (2020). EM-SETS: An Integrated E-Module of Environmental Education and Technology in Natural Science Learning. *International Journal Advanced Science and Technology*, 29(03), pp. 7014-7025.
- [13] Kolb, Alice Y & Kolb, David A. (2005). *The Kolb Learning Style Inventory-Version 3.1*. boston: Hay Resources Direct.
- [14] Alamanda, Gilang C. (2014). Penerapan Model Pembelajaran Experiential Learning terhadap Perubahan Konseptual Siswa pada Materi Sifat-sifat Cahaya. UPI: Bandung.
- [15] Sholihah, D.A. (2016). Keefektifan Experiential Learning Pembelajaran Matematika MTs Materi Bangun Ruang Sisi Datar. *Jurnal Riset Pendidikan Matematika*, 2(2), pp. 175-185.
- [16] Andromeda, Ellizar, et al. (2018). Validitas dan Praktikalitas Modul Laju Reaksi Terintegrasi Eksperimen dan Keterampilan Proses Sains untuk Pembelajaran Kimia di SMA. *Jurnal Eksakta Pendidikan*, 6(3), pp. 414.
- [17] Riduwan. (2009). *Belajar Mudah Penelitian untuk Guru, Karyawan, dan Peneliti Pemula*. Bandung: Alfabeta.
- [18] Andromeda, et al. (2018). Validity and Practicality of Experiment Integrated Guided Inquiry-Based Module on Topic of Colloidal Chemistry for Senior High School. *IOP Conf. Ser.* 335 012099.