Students' Responses About Using E-Module for Physics Practicum in Pandemic Era

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Abstract. This research aimed to describe students' responses about using e-module for physics practicum in pandemic era. This research was qualitative research with descriptive method. There were 40 respondents who filled a questionnaire via google form. All of respondents are students of physics education program in Universitas Bengkulu who did physics practicum in 2020 that conducted online because of pandemic (Covid-19) era. The questionnaire was about how e-module has been used and e-module should be. The results showed that 62.5% of students got e-module in portable document format (PDF) and the others in word document (.doc or .docx). 75% of students opened e-module by using smartphone and laptop, 17.5% only by using smartphone and the others printed out module. Almost students (95%) accessed e-module by downloading and then learned offline meanwhile 5% learned online. There were 95% of students want e-module that used to have tutorial video in it and all of them want e-module that used to have scientific approach so their science process skills could be improved. Based on the results, e-module should be opened not only by using laptop but also smartphone. The e-module must be developed by inserting tutorial videos and using scientific approach.

Keywords: Students' Responses · E-Module · Physics Practicum · Pandemic Era

1 Introduction

Practicum is one of the activities that can be done in the laboratory. Practicum plays a role in supporting the success of the science learning process. Studying science through practical activities can train students to make observations, think scientifically, instill and develop scientific attitudes, and practice problem solving through the scientific method. Practical activities have several advantages including: a) providing a concrete picture of an event, b) being able to directly observe/observing the process, c) being able to develop inquiry skills, d) being able to develop scientific attitudes, and e) being able to assist teachers in facilitating achieve effective learning goals [1].

Basic physics courses consist of theoretical and practical lectures. Basic Physics Practicum has a weight of 1 credit with the intention that students have laboratory skills

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in the field of basic physics [2]. Practicum is carried out to support basic physics learning so that students' mastery of basic physics can be improved [3].

Practical activities are ideally carried out offline. However, due to the COVID-19 pandemic, practicum activities must be carried out online [4]. Likewise with the basic physics practicum. Although the basic physics practicum is carried out online, the activity still requires a practicum guide module. This is because basic physics practicum activities can run well if they are supported by basic physics practicum guidelines [3, 5, 6]. Practical instructions have a strategic function for the teaching and learning process that can help lecturers and students in practical learning activities [7].

The implementation of the online physics practicum requires the practicum supervisor to develop a basic physics practicum guide module that can also be used online. One form of module that can be used is an electronic module (e-module). E-module is a form of presenting self-study materials that are systematically arranged into certain learning units, which are presented in an electronic format, where each learning activity in it is connected by a link as a navigation that makes students more interactive with the program, equipped with an e-module with the presentation of video tutorials, animations and audio to enrich the learning experience [8].

Basic physics practicum using e-modules can help to develop students' abilities in investigating objects, symptoms, and problems where educators act as facilitators and commentators on the problems faced by students in determining work procedures, data analysis, and drawing conclusions. The basic physics practicum e-module must contain activities that students can do individually so that they are effective in improving students' science process skills [9].

Based on this, it is necessary to analyze how the basic physics practicum e-module is used during the pandemic and how students perceive the basic physics practicum e-module that should be used.

2 Research Methods

This research is quantitative research with descriptive method. Descriptive method is a method used to analyze data by describing or describing the data that has been collected as it is without intending to make conclusions that apply to the public or generalizations [10]. The research data was obtained by giving questionnaires that had been validated by experts to students and written interviews with lecturer assistants. The students who became respondents were 40 students of the Bengkulu University physics education study program who had carried out the basic physics practicum in 2020. While the lecturer assistants who were interviewed in writing amounted to 8 people.

The primary data in this study were the answers to the questionnaires of 40 students. While the results of the written interview assistant lecturers are secondary data. Both were analyzed qualitatively to explain the findings.

3 Results and Discussion

The questionnaire given to the respondents consisted of several questions about how the e-modules they had used and what students' perceptions of the basic physics practicum e-module should be. The results of student answers are shown in the following pictures.

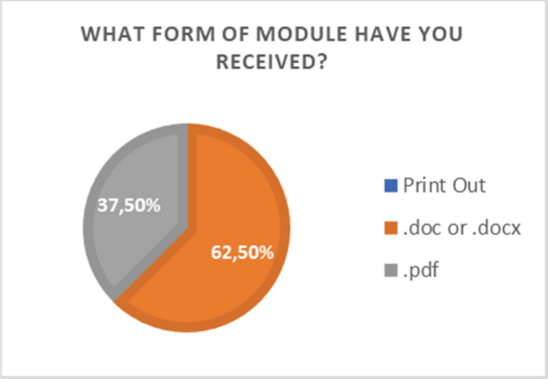

Fig. 1. The form of the Practicum Module Received.

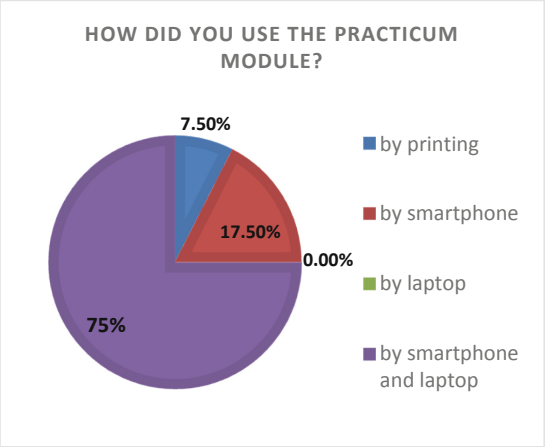

Fig. 2. How to use the Practicum Module.

Figure 1 shows that 62.5% of students receive the electronic practicum module in .doc or .docx document format. A total of 37.5% of students receive the portable document format (PDF). Meanwhile, none of the students received the practicum module in printed form. However, there were 7.5% of students who scored the electronic practicum module as shown in Fig. 2.

Figure 2 shows that the majority of students, which is 75%, use the practicum module by opening it via smartphones and laptops, 17.5% of students using only smartphones and 7.5% of students printing it. Meanwhile, none of the students only opened it via a laptop. How to access the practicum module so that it can be opened via smartphones and laptops is shown in Fig. 3.

Based on Fig. 3, as many as 95% of students download the e-module practicum guide and then study it offline. Meanwhile, 5% of students study e-modules online.

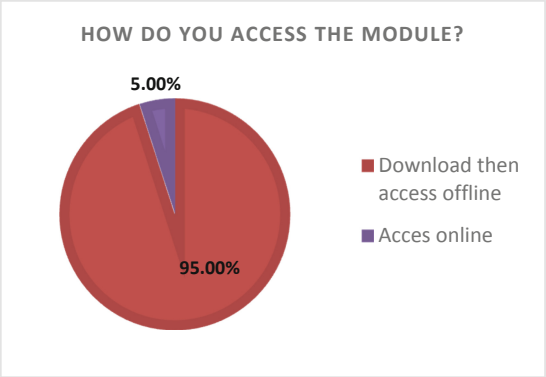

Fig. 3. How to Access the Practicum Module

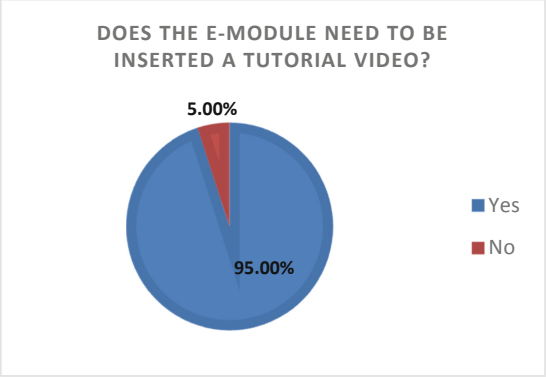

Fig. 4. The Need for Availability of Video Tutorials

The results shown in Figs. 1, 2, and 3 are supported by the interview results of the lecturer assistant who stated that it was true that the basic physics practicum e-module used by students was in PDF form. Some students convert the e-module into .doc or .docx format and print it. The e-module is distributed through the WhatsApp application so that students can download it directly via their smartphone or laptop by logging into the WhatsApp website. The WhatsApp application was chosen because it is used by all students and does not use a large internet quota [11].

Practical guide modules made in electronic form can be accessed offline and online, can be opened with smartphones and laptops, anytime and anywhere [12] so that the use of the practicum guide module becomes easier because it can be carried anywhere and saves paper [13]. Based on the results of questionnaires and written interviews, the e-module used in 2020 has not yet included a practicum tutorial video. The following are student responses regarding the need for video tutorials in the basic physics practicum e-module.

Figure 4 shows that only 5% of students feel that there is no need for a video tutorial in the e-module of the basic physics practicum guide. While 95% of students feel the

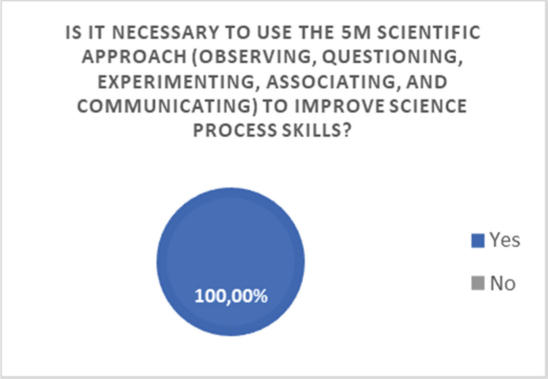

Fig. 5. The Need for the Use of a Scientific Approach

need for video tutorials in the e-module. This is also supported by 7 out of 8 lecturer assistants as in written interviews. The existence of practical video tutorials aims so that students can know the tools and materials commonly used in practicum, the procedure for working on an experiment, what happens during the experiment, and concepts that need to be understood from the results of the experiment [14]. This is also relevant to the results of research which states that physics content needs to be integrated with simulations/videos so as to help students learn physics [15].

The basic physics practicum guide module can help achieve the expected physics learning outcomes, especially science process skills when prepared with a model or approach. Such as research that develops a guided inquiry-based basic physics practicum module [5, 16, 17] and using a contextual approach [18]. The development of a basic physics practicum guide using a scientific approach has not been carried out. Based on the results of student questionnaires, students feel that e-modules need to be compiled using a scientific approach as shown in Fig. 5.

Figure 5 shows that 100% of students feel the need to use a scientific approach consisting of 5M, namely observing, asking, trying, associating, and communicating to improve practical skills (scientific process skills). This is supported by the statement of the lecturer assistant in the interview that the student has not mastered several indicators of science process skills such as asking questions related to experimental hypotheses, drawing graphs and compiling tables, and connecting experimental results with theory.

Therefore, it is necessary to develop an e-module for basic physics practicum guides with a scientific approach. This is because learning activities in a scientific approach accommodate the achievement of all indicators of science process skills [19] so that the scientific approach is suitable to be applied to improve science process skills [20].

4 Conclusion

Based on the results and discussion, it can be concluded that the basic physics guide e-module used during the pandemic by students is in PDF, .doc, or .docx formats. Most students use smartphones and laptops to open the e-module. Students expect that the

e-module used can be inserted with video tutorials and compiled based on a scientific approach in order to improve science process skills.

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References

1. Erwin, Permana, I. & Hayat, M. S. Strategi Evaluasi Program Praktikum Fisika Dasar. *Jurnal Penelitian Pembelajaran Fisika* **9**, 12–20 (2018).
2. Suprianto, Kholida, S. I. & Andi, H. J. PENGEMBANGAN PANDUAN PRAKTIKUM FISIKA DASAR 1 BERBASIS GUIDED INQUIRY UNTUK MENINGKATKAN KEMAMPUAN HARD SKILL DAN SOFT SKILL MAHASISWA (CALON GURU FISIKA). in *Seminar Nasional Hasil Penelitian Universitas Kanjuruhan Malang* 487–494 (2017).
3. Sirait, R. & Lubis, N. A. ANALISIS BUKU PANDUAN PRAKTIKUM FISIKA DASAR DI FAKULTAS SAINS DAN TEKNOLOGI UIN SUMATERA UTARA MEDAN. *JISTech (Journal of Islamic Science and Technology)* **5**, 71–79 (2020).
4. Ratnawati, D. & Vivianti. PERSEPSI MAHASISWA TERHADAP PEMBELAJARAN DARING PADA MATA KULIAH PRAKTIK APLIKASI TEKNOLOGI INFORMASI. *Edukasi Elektro* **4**, 110–120 (2020).
5. Misbah, Wati, M., Rif'at, M. F. & Prastika, M. D. Pengembangan Petunjuk Praktikum Fisika Dasar I Berbasis 5M Untuk Melatih Keterampilan Proses Sains dan Karakter Wasaka. *Jurnal Fisika FLUX* **15**, 26–30 (2018).
6. Darmaji, Kurniawan, D. A., Astalini & Nasih, N. R. Persepsi Mahasiswa pada Penuntun Praktikum Fisika Dasar II Berbasis Mobile Learning. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan* **4**, 516–523 (2019).
7. Murniati, M.S, S. & Muslim, M. PENGEMBANGAN PETUNJUK PRAKTIKUM FISIKA SEKOLAH I BERBASIS KETRAMPILAN PROSES SAINS MAHASISWA CALON GURU. *Jurnal Inovasi dan Pembelajaran Fisika* **5**, 15–25 (2018).
8. Direktorat Pembinaan SMA, Direktorat Jenderal Pendidikan Dasar dan Menengah & Kementerian Pendidikan dan Kebudayaan. *Panduan Praktis Penyusunan E-Modul*. (2017).
9. Dari, R. W. & Nasih, N. R. ANALISIS KETERAMPILAN PROSES SAINS MAHASISWA PADA PRAKTIKUM MENGGUNAKAN E-MODUL. *Edu Sains: Jurnal Pendidikan Sains dan Matematika* **8**, 12–21 (2020).
10. Sugiyono. Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D. (Alfabeta, 2013).
11. Matsun & Saputri, D. F. PENGEMBANGAN E-MODUL FISIKA BERBANTUAN WHATSAPP SEBAGAI ALTERNATIF PEMEBALAJARAN DI MASA PANDEMI COVID 19. *ORBITA.Jurnal Hasil Kajian, Inovasi, dan Aplikasi Pendidikan Fisika* **6**, 213–220 (2020).
12. Putri, R. K. Analisis Kebutuhan Pengembangan Petunjuk Praktikum Fisiologi Tumbuhan untuk Pembelajaran Jarak Jauh. in *Prosiding Seminar Nasional FITK UIN Jakarta* 19–26 (2021).
13. Darmaji, Kurniawan, D. A., Astalini & Nasih, N. R. Persepsi Mahasiswa pada Penuntun Praktikum Fisika Dasar II Berbasis Mobile Learning. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan* **4**, 516–523 (2019).

14. Saraswati, N. L. P. A. & Mertayasa, I. N. E. PEMBELAJARAN PRAKTIKUM KIMIA PADA MASA PANDEMI COVID-19 : QUALITATIVE CONTENT ANALYSIS. *Wahana Matematika dan Sains: Jurnal Matematika, Sains, dan Pembelajarannya* **14**, 144–161 (2020).
15. Liana, Y. R., Ellianawati & Hardyanto, W. Pengembangan E-Modul Interaktif Berbasis Android Menggunakan Sigil Software pada Materi Listrik Dinamis. in *Prosiding SEMINAR NASIONAL PASCASARJANA UNNES* (Universitas Negeri Semarang, 2019).
16. Saraswati, D. L. Pengembangan Modul Praktikum Fisika Dasar Berbasis Inquiry Leraning Tipe Terbimbing untuk Mahasiswa Pendidikan Matematika. in *Prosiding Seminar Nasional dan Diskusi Panel Pendidikan Matematika Universitas Indraprasta PGRI* 431–438 (Universitas Indrapasta PGRI, 2020).
17. Suprianto, S., Kholida, S. I. & Andi, H. J. Panduan Praktikum Fisika Dasar 1 Berbasis Guided Inquiry Terhadap Peningkatan Hard Skills dan Soft Skills Mahasiswa. *Momentum: Physics Education Journal* **1**, 122–139 (2017).
18. Yolanda, Y., Lovisia, E. & Amin, A. PENGEMBANGAN MODUL PRAKTIKUM FISIKA DASAR BERBASIS KONTEKSTUAL MATERI ALAT-ALAT OPTIK SEBAGAI SUMBER BELAJAR MAHASISWA. in *NCOINS: National Conference Of Islamic Natural Science* 89–106 (IAIN Kudus, 2021).
19. Ika, Y. E. IMPLEMENTASI PENDEKATAN SAINTIFIK UNTUK MELATIH KETERAMPILAN PROSES SAINS SISWA SMA. *Jurnal Dinamika Sains* **2**, 1–5 (2018).
20. Laelasari, N. & Sari. PENERAPAN PENDEKATAN SAINTIFIK UNTUK MENGEMBANGKAN KETERAMPILAN PROSES SAINS DAN SIKAP ILMIAH SISWA PADA KONSEP KELARUTAN DAN HASIL KALI KELARUTAN. *Jurnal Tadris Kimiya* **1**, 20–26 (2016).