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Development of Flipbook-Assisted Practical Guide on Measurement Physics Materials to Increase Junior High School Student Learning Motivation

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Abstract: Science learning is a learning process that emphasizes natural phenomena and their relationships. This development research aims to determine the feasibility of a flipbook-assisted practicum guide that has been made, and to determine students' learning motivation using flipbook media on measuring physics material which is associated with measuring ideal body weight. The instrument used was 20 students from SMP Negeri 5 Jombang Class VII F. The results obtained were validation of media experts and material experts with a summary of aspects obtained by an average of 84.25% with a very good category. For the validation of the student response questionnaire the average percentage of 89.75% in the very good category. And the results of the student learning motivation response questionnaire with 3 aspects of the assessment averaged 84.60% in the very good category, so this flipbook-based media can be used to increase the motivation of junior high school students in measuring practicum.

Keywords: Learning Motivation; Media Flipbook; Practicum Measurement

Introduction

Science learning is a learning process that emphasizes natural phenomena and their relationships. So, this learning process is not only in terms of knowledge but also in terms of attitudes, results, and applications that must be done. Science learning requires skill in linking concepts and concrete evidence (Mutveia and Mattssonb, 2014).

Physics learning in measurement cannot be separated from activities in the laboratory, which later students will do a practicum in it. The process skills approach to learning activities makes it easier for students to understand abstract concepts and put them into practice by implementing practicum (Zainuddin et al., 2020).

When measuring a quantity, a measuring instrument is needed that matches the quantity to be measured. In detail, the measurements are distinguished based on the size and level of accuracy. So, to find out the accuracy of the concept of measurement in students, it is necessary to carry out activities that are direct in nature so that students gain experience. This agrees with (Khanam, 2015) through practical activities one can learn the concepts of physics directly. In making measurements, it is necessary to use a measuring instrument that is in accordance with the quantity to be measured. And during the practicum, of course, it must be supported by complete facilities and good and appropriate practicum guidebooks.

Advances in technology provide ideas for humans to produce many tools that can help ease a thing or work done. One of the results is the creation of a tool used to measure human height and weight. Measuring body weight, humans simply climb the tool. Meanwhile, measuring height, in general, humans are still done manually (Nurlette, 2018).

Technological developments also affect the world of education. With the development of mobile devices that can make it easier for someone to do something, education and communication. The presence of laptops, notebooks, Ipads, and others is expected to help in

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advancing education. Various types of e-books and digital books have been used in education today. Recently, many digital books have been developed in the open electronic book package (OPF flipbook) format (Hayati et al., 2015).

BMI (body mass index) is an indicator of the relative level of body fat in a person aged 20 years and over. BMI is used to determine a person's weight status whether a person has a body that is too thin, ideal, or too fat. To calculate a person's BMI, it is necessary to know that person's weight in kilograms (kg) and his height in meters (m) (Nurlette, 2018).

The function of the media in the learning process, especially practicum, is quite important and helps to improve the quality of learning, especially helping students to learn both in the laboratory and independently. Two very important elements in the learning process are methods and learning media. The selection of a method can determines the learning media that will be used in the learning, learning media are not necessarily used in the learning process (Rusman, 2015). Several previous studies have stated that media using E-books, E-modules, and E-teaching materials are very practical and effective which can help students do it independently because they are assisted by operating instructions, make it easier to understand concepts, and are interesting for students before doing the activity. practice (Widya, 2021)

In this study, the researcher will design a flipbook-assisted practicum guide on physics material that is associated with measurements with the research objective, namely to test the feasibility of the product produced and to find out student responses after using the flipbook in order to obtain an increase in the motivation of junior high school students.

Method

The development of a flipbook-assisted practicum guide on measuring physics material related to ideal body weight uses research and development or R&D (research and development) methods. According to Sugiyono (2015), research and development is a research method with the aim of producing certain products, and testing the effectiveness of these products. And the development model in this study uses a 4D development model. According to Thiagarajan (Sugiyono, 2015: 37) suggests that the research and development steps are abbreviated as 4D stands for Define, Design, Development, and Dissemination. The 4D research model is more precisely used for media development as a web-based guide and software that can be developed systematically, easily understood, and studied in flipbook-assisted media development.

Analysis of data from the media and materials expert validation response questionnaire, as well as a response questionnaire regarding student motivation after using a flipbook-assisted practicum guide, the following table converts the actual score to a four-scale value:

Table 1. Determination of the actual score to a four-scale

Interval Value	Range	Percentage	Value	Interpretation
X > Mi + 1.Sbi	X ≥ 3	X ≥ 75	A	Very Good
Mi + 1.Sbi > X ≥ Mi	3 > X ≥ 2.5	75 > X ≥ 62.5	B	Good
Mi > X Mi – 1.Sbi	2 .5 > X ≥ 2	62.5 > X ≥ 50	C	Less
X < Mi – 1.Sbi	X < 2	X < 50	D	Very Less

(Mardapi, 2007)

Information:
X = Respondent's score
Mi = Average = 1/ 2 (maximum score + minimum score)
Sbi = Ideal Standard Deviation

Based on the four-scale assessment criteria, the four-scale assessment criteria can be interpreted in Table 2.

Table 2. Ideal Assessment Criteria with four-scale

Range	Interpretation
X ≥3	Very Good
3 > X ≥ 2.5	Good
2.5 > X ≥ 2	Less
X < 2	Very Less

After this research data was collected using l validation sheets in the form of google forms for media experts, and material experts, and student motivation responses, as well as data analysis using a *Likert*. The following is a picture of the display of the google questionnaire form for student responses:

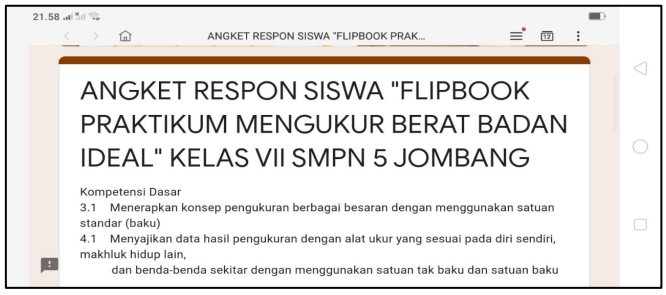

Figure 1. Display of the Google Questionnaire Form.

Stage *The define* consists of the initial stage, the formulation of the concept of media development, and student observation. At the *design* (design) the preparation of the instrument. In the *develop*, which is the stage of expert assessment and testing of this media development, then in the *disseminate*, it is only carried

out in a limited way to class VII F SMP Negeri 5 Jombang with a sample of 20 students.

Result and Discussion

This study aims to determine analysis of the feasibility of the media through the validation of media and material experts as well as a questionnaire response to students' learning motivation. This development research was conducted at SMP Negeri 5 Jombang class VII F. The following are the results obtained from media experts and material experts in table 1.

Table 1. Flipbook Feasibility Validation Data by Media Experts & Material Experts

Aspect	Percentage	Category
Eligibility	82%	Very Good
Language	95%	Very Good
Presentation of text, images, and videos	80%	Very Good
Graphics	80%	Very Good
Average	84.25	Very Good

Based on Table 1. The results of the validation of the feasibility of the flipbook-assisted practicum guide by media experts and the material in the very good category can be seen from the average. The average obtained is 84.25% with adjustments from the assessment scores in this study. Aspects assessed by media experts and material experts are summarized in as many as 4 points, namely aspects of the feasibility of content, language, presentation of text, images, and videos as well as, graphics. And it can be said that this media can help students to be motivated in learning activities, especially in practicum.

Based on previous researchers (Mulyaningsih & Saraswati, 2017) the use of digital flipbook media for the *Sequence of Service* in the learning process has advantages, including making it easier for students to learn independently and increasing motivation in practicum. Thus, the digital flipbook media for the *sequence of service* can have an influence on understanding concepts and implementing practicums to increase student learning outcomes. This is supported by the analysis of the application of digital books using kvsoft maker and the results show that there is an effect of using digital books based on understanding concepts and student learning outcomes from an average of 70 for the control class (normalized gain 0.4) to 84 for the experimental class (normalized gain 0.7).

The development of practicum guides is carried out with the aim of making students more active and able to develop process skills through the activities contained in the practicum guides that have been developed (Prayitno, 2017), the results of the needs analysis found that 46.50% of students agreed and 4.70% of students strongly agree that they still find it difficult to study practical experiments, thus it is important to develop a flipbook-based practicum guide that can improve student learning outcomes because it contains multimedia elements (Hayati et al., 2015).

In this study, the results of the validation of the student motivation response questionnaire are as follows:

Table 2. Data validation of the Student Motivation Response Questionnaire

Validator	Percentage
1	85%
2	90%
3	90%
4	94%
Average	89%

Based on Table 2. Validation results from to four validators, the questionnaire obtained an average of 89% categorized as very good for knowing motivation in learning and practicum activities.

Table 3. Data on Student Motivation Response Questionnaire for Flipbook

Aspect	Percentage	Category
Interest	82%	Very Good
Understanding	82%	Very Good
Practicality	90%	Very Good
Average	84.60%	Very Good

Based on Table 3, Results of the questionnaire response to learning motivation in practical activities obtained an average of 84.60% in the very good category, as the learning motivation of students is seen from the aspects of learning interest, student understanding, and the practicality of using media so that the developed media can be a good medium to be developed as a practical guide media. The result of this research has similar to (Setianingrum et al., 2022) said that: (1) module Flipbook-based science is worth seeing from the percentage of the feasibility of the module 96.73% (very feasible), (2) Student responses to the module are in the very good category in terms of the percentage of interest to the module 90.00% (very interested), and student independence in learning science using the flipbook-assisted science module is included in the high category, with a percentage of 86.25%. (high independence in learning science).

Conclusion

The development of this flipbook-assisted practicum guide can provide motivation in student learning activities, this is evidenced by the validation obtained from media experts and material experts at an average of 84.25% in the very good category. And to find out the level of learning motivation seen from the results

of student questionnaires with a percentage of 84.60% in the very good category. So that the product of this research can be used to increase students' motivation and knowledge in physics subjects, especially measurement materials associated with measuring ideal body weight for class VII F of SMP Negeri 5 Jombang. And it can also be developed for other learning to give a practical and effective impression.

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