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Validity of Flipbook-Based Practicum Guide Fungus Identification as A Learning Solution in The Covid-19 Pandemic

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ABSTRACT

The pandemic COVID-19 has affected educational activities in Indonesia so that the learning process that was previously carried out offline must be transferred to offline or online. This makes new changes for teachers by utilizing digital media or technology as alternative media in conveying information as e-learning learning. The previously carried out practicum must change to online by being carried out at their respective homes. The practicum continues but must be accompanied by a guideline as an organizer of the practicum. Thus the practical instructions are designed in a digital book to make it easier for students to access them via the internet. A study was conducted to develop a practical guide flipbook on the validity of a learning solution during the COVID-19 pandemic. The development model used is 4-D (four D). The model only arrives at three stages because of the current conditions, namely the COVID-19 pandemic, including the definition, design, and development stages. The technique of collecting data is by distributing instruments in the form of validation sheets to expert validators. The validator consists of 2 Biology teachers, one linguist, and one student. The validation sheet consists of five aspects: material/content aspects, presentation aspects, language aspects, graphic aspects, and evaluation. The results of the validation test are then averaged to find out the validity. Based on the results of the validation test, the average value was 81.5%. This value is categorized as very valid.

Keywords: COVID-19, Validity, Utilization of Technology, Practical Guidelines, Flipbook

INTRODUCTION

The COVID-19 pandemic has resulted in more than 4.3 million confirmed cases and over 290,000 deaths globally (Nicola et al., 2020). COVID-19 is a SARS-CoV-2 virus that causes infection in the human respiratory system. The impact of the symptoms of COVID-19 has affected all aspects of life in terms of health, economy, and education throughout the country (Li et al., 2020). Currently, the COVID-19 pandemic has affected educational activities in Indonesia (Abidah et al., 2020). Schools must be closed to prevent the spread of the coronavirus so that a Social Distancing System is implemented. Changes in learning activities that were previously carried out face-to-face must be replaced with online or online learning at home (Chick et al., 2020; Ro'fah et al., 2020). Online learning is an effort by the government so that the learning process amid COVID-19 continues (Sadikin et al., 2020). Online learning is learning that utilizes technology as the delivery of information (Fitriyani et al., 2020).

The use of this technology can be in the form of smartphones, computers as one example of utilizing infrastructure in schools (Badia& Marta, 2016). The use of smartphones and computers is adjusted to the needs as well as in conveying subject matter information through the use of technology (Setiyo& Harlin, 2018). This technology can be used in developing teaching materials to support teaching and learning activities (Diani et al., 2018). One alternative for developing teaching materials is e-books (Muhlas&Kontjoro, 2019). In addition, you can also use various educational software whose purpose is to access various knowledge from various sources other than books (Gudanescu, 2010). Thus these alternatives can support the quality of student learning both at school and home (Yuberti, 2015). This statement is by the thoughts of Jafnihirda et al. (2019) that learning objectives can be achieved if student learning will be more effective and efficient by utilizing technology.

Thus, a teacher demands to innovate, one of which is the learning process into e-learning as the use of technology in education (Gudanescu, 2010). The innovation that can be done by teachers is to develop online learning media so that students can still access them via the internet (Muhlas&Kontjoro, 2019). Learning is part of the change in the current teaching and learning system. Practical learning that was previously carried out offline must now be carried out independently at home. The practicum requires practical instructions as a guide for the implementation of the practicum (Budiarti& Oka, 2017). Practical instructions are generally only a sheet of information contained in certain materials, or there are no practical supporting instructions (Prayitno, 2017; Susanti et al., 2018). In addition, the existing practicum instructions are only limited to work or practicum with a conventional approach without developing student skills (Sari &Zulfadewina, 2020; Yuanita&Yuniarita, 2018). This is in line with the statement of Puspitasari et al. (2015) that the use of learning media is not optimal, especially practical manuals, in improving critical thinking skills so that students tend to be passive. Whereas practical instructions that develop critical thinking skills can direct students to learn to analyze (Susantini&Lisdiana, 2012), problem-solving, and reasoning (Sarigoz, 2012). Thus, practical instructions that develop critical thinking skills can be used to guide students' practicum activities in the laboratory (Budiarti& Oka, 2017). In addition, the existing practicum instructions are only limited to work or practicum with a conventional approach without developing student skills (Sari &Zulfadewina, 2020; Yuanita&Yuniarita, 2018). This is in line with the statement of Puspitasari et al. (2015) that the use of learning media is not optimal, especially practical manuals, in improving critical thinking skills so that students tend to be passive. Whereas practical instructions that develop critical thinking skills can direct students to learn to analyze (Susantini&Lisdiana, 2012), problem-solving, and reasoning (Sarigoz, 2012). Thus, practical instructions that develop critical thinking skills can be used to guide students' practicum activities in the laboratory (Budiarti& Oka, 2017). In addition, the existing practicum instructions are only limited to work or practicum with a conventional approach without developing student skills (Sari &Zulfadewina, 2020; Yuanita&Yuniarita, 2018). This is in line with the statement of Puspitasari et al. (2015) that the use of learning media is not optimal, especially practical manuals, in improving critical thinking skills so that students tend to be passive. Whereas practical instructions that develop critical thinking skills can direct students to learn to analyze

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Practical instructions that are easily accessible to students are designed to be flipbooks through software applications on smartphones or computers (Dhir, A., Gahwaji, NM, & Nyman, 2013). The flipbook-based learning media is a combination of print media and digital media in learning activities (Mulyaningsih&Saraswati, 2017). The development of flipbook-based learning media is practically applied at school or home (Setiyo& Harlin, 2018). This statement is supported by research by Mulyaningsih&Saraswati (2017) that the application of kvisoft flipbook maker-based learning media has a significant effect on<0.05 on understanding concepts and student learning outcomes. This is in line with the research of Dianni et al. (2018) that the results of the field test from the development of physics learning media with professional 3D page flip obtained an average of 86%, which is categorized as very valid, which means getting a good response from teachers and students. Based on this statement, flipbook-based learning media can be accessed online and offline (Wibowo &Pratiwi, 2018). Besides being easily accessible, flipbook-based learning media certainly has more value, namely the existence of practical instructions that train science skills and critical thinking.

Thus, researchers harmonize from previous research as a reference for developing learning media as a form of learning media solutions amid the COVID-19 pandemic. The objectives of this study were 1.) to design a practical guide for identifying mushrooms on fruit-based on flipbooks as a valid learning solution during the COVID-19 pandemic and 2.) to describe the validity of the practical instructions for identifying mushrooms on fruit-based on flipbooks as a learning solution during the COVID-19 pandemic. 19 that have been designed.

METHODS

The research developed is development research (R & D) which aims to produce a flipbook-based Biology practicum guide as a valid learning solution during the COVID-19 pandemic. The model used in this study adopts the model suggested by Sivasailam Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (1974) in (Anggraini, 2016) which is 4-D (four D). The stages of the development model have modified again, only explaining up to the three stages contained in this paper. These stages are: the stage of defining the needs analysis for product development materials, the design stage, which contains the manufacture or design of products using Flip PDF Professional software; and the development stage is a stage that includes product testing and product revisions being developed (Rochmad, 2012). At this stage of development, the product developed is considered quality if it meets the criteria of being valid, practical, and effective (Nieveen, 1997). Terms are valid if they include consistent state-of-the-art knowledge. Practical requirements if it meets the needs, desires, and constraints that are conceptual. Terms are effective if an evaluation is carried out on product

development (Nieveen, 1997). However, the product quality assessment developed in this study only explains the validity test. Research on the identification of fungi on fruit as material for designing practical instructions was carried out in July – August 2020 at the UNIROW Biology laboratory. At this stage of development, the product developed is considered quality if it meets the criteria of being valid, practical, and effective (Nieveen, 1997). Terms are valid if they include consistent state-of-the-art knowledge. Practical requirements if it meets the needs, desires, and constraints that are conceptual. Terms are effective if an evaluation is carried out on product development (Nieveen, 1997). However, the product quality assessment developed in this study only explains the validity test. Research on the identification of fungi on fruit as material for designing practical instructions was carried out in July – August 2020 at the UNIROW Biology laboratory. At this stage of development, the product developed is considered quality if it meets the criteria of being valid, practical, and effective (Nieveen, 1997). Terms are valid if they include consistent state-of-the-art knowledge. Practical requirements if it meets the needs, desires, and constraints that are conceptual. Terms are effective if an evaluation is carried out on product development (Nieveen, 1997). However, the product quality assessment developed in this study only explains the validity test. Research on the identification of fungi on fruit as material for designing practical instructions was carried out in July – August 2020 at the UNIROW Biology laboratory. And conceptual constraints. Terms are effective if an evaluation is carried out on product development (Nieveen, 1997). However, the product quality assessment developed in this study only explains the validity test. Research on the identification of fungi on fruit as material for designing practical instructions was carried out in July – August 2020 at the UNIROW Biology laboratory. And conceptual constraints. Terms are effective if an evaluation is carried out on product development (Nieveen, 1997). However, the product quality assessment developed in this study only explains the validity test. Research on the identification of fungi on fruit as material for designing practical instructions was carried out in July – August 2020 at the UNIROW Biology laboratory.

Research Instruments

The instrument used in this study was a validation sheet. The validation sheet contains five aspects/criteria, which include material aspects, presentation aspects, language aspects, graphic aspects, and evaluation.

Data collection technique

The data collection technique used in this study was to distribute the instrument in the form of a validation sheet to expert validators. The expert validators consist of 4 expert validators which include material experts (2 people), linguists (1 person), and users (1 person).

Data analysis technique

The results of the validation assessment by the validator were then analyzed using quantitative descriptive methods. Furthermore, each aspect is averaged in the form of a percentage using a formula that refers to Prayitno (2017).

$$(P(s) = \frac{(x)}{(x1)} x\ 100\ \%$$

Information:
P(s) : Percentage of each criterion
(x) : Total score for each criterion
(x1) : Total score max

After each criterion gets a validity value, the sum of these values is then averaged to get the final result regarding the product. The average result is used as a guideline to assess the validity based on the score obtained. The criteria used to interpret the validation score refer to Prayitno (2017), which can be seen in Table 1.

Table 1. Criteria for Interpretation of Validation Scores

Score (100%)	Information
0 - 20	Very Invalid
21 – 40	Less Valid
41 – 60	Quite Valid
61 - 80	Valid
81 – 100	Very Valid

If the score obtained is 61, then the results of the validation test of the product are categorized as valid or feasible to be carried out to the next stage.

RESULT AND DISCUSSION

Research result

This research is development research whose stages refer to the 4-D development model. In this paper, these stages include the definition stage, the design stage, and the development stage.

Defining Stage

At this stage, carrying out observations in schools related to the analysis of practicum activities, subject matter, and student activities during learning will be done. In these stages, subject matter that has never been carried out in practicum activities was obtained, namely Kingdom Fungi material, especially microscopic mushrooms.

Design Stage

This stage is a continuation of the previous stage. This design stage consists of making a syllabus, lesson plans, science skills rubric, critical thinking skills rubric, instrument rubric, and product design. In designing the product, the initial steps in the process of making the media are as follows: Practical instructions for identifying mushrooms on fruit must be in the form of a PDF file→ Download the Flip PDF Professional application and install it on your computer or mobile phone → touch create new project found at the beginning of the display → select version and touch "ok" → select a file by touching browse to find the desired file → after the file is selected touch import now and wait for the converted page process to finish → if the file is successful → edit the background to make it more attractive by selecting style templates and selecting "ok" →publish and select the desired file type *.exe. The results of the developed product design can be seen in Figures 1 to 12.

Figure 1. Cover of Practicum Instructions

Figure 2. Preface and Table of Contents

Figure 3. Chapter 1 Introduction

Figure 4. Practical Objectives and Theory Basis

Figure 5. Chapter 2 Research Methodology

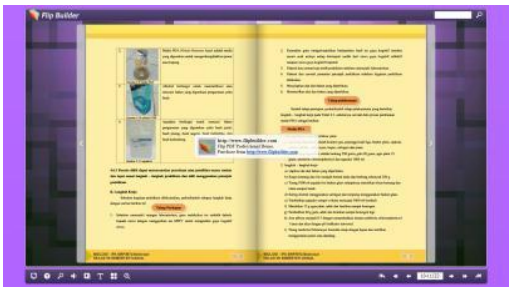

Figure 6. Work Steps

Figure 7. Implementation of Work Steps

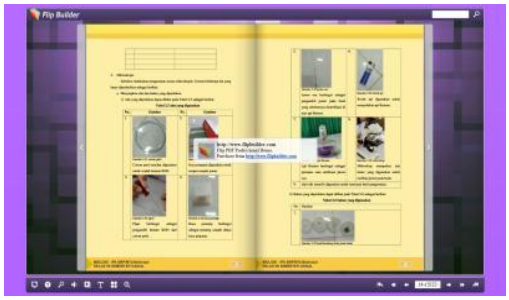

Figure 8. Microscopic Observation Stage

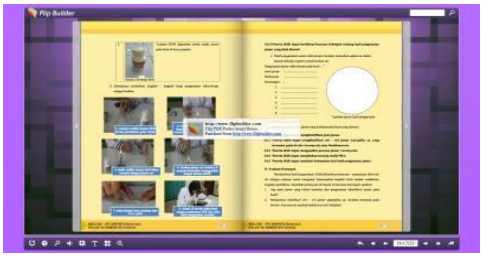

Figure 9. Steps of Microscopic Observation Work

Figure 10. Group Evaluation and Post-Test Questions

Figure 11. Glossary and Bibliography

Figure 12. Biography

Development Stage

This stage is carried out to test the quality of the resulting product. These stages include an assessment of 3 aspects to determine the quality of the developed product, namely: validity, effectiveness, and practicality. However, at the Develop stage in this research, it is only up to the validity test. Aspects of practicality and effectiveness of the practical instructions for identifying mushrooms on fruit that have been designed need to be tested offline at school or online. This validity test was carried out to determine the level of validity of the practical instructions for identifying mushrooms on fruit. The validity test was carried out by four validators which included one material expert and one linguist, one education practitioner, namely the Biology subject teacher at MTs ManbailFutuhJenu, and one student as a user. The results of the validation test are seen from several aspects of validation. Based on the assessment of the material aspects, presentation, language, graphics, and evaluation of the practicum instructions, it can be seen in Tables 2 to 6

Table 2. Validation Test Results on Practical Instruction Material

Aspect	Indicator	Validator Score				amount	Average	Criteria
		1	2	3	4			
Theory	Relation of title to the material	5	4	4	4	17	85 %	SV
	Clarity of meaning contained in the title	5	5	3	5	18	90%	SV
	Conformity of practicum objectives with learning objectives	4	4	3	5	16	80%	V
	Practical work steps contain activities that reflect scientific skills	3	4	4	4	15	75%	V
	The suitability of practical work steps with indicators of science skills	3	4	3	3	13	65%	V
Average							79%	V

Table 3. Validation Test Results on Presentation of Fungus Identification Practical Instructions

Aspect	Indicator	Validator Score				amount	Average	Criteria
		1	2	3	4			
Presentation	Practical instructions are prepared according to the rules of the Ministry of National Education and the SMP/MTs textbooks.	4	4	3	3	14	70%	V
	Components of practical instructions are arranged systematically	3	4	4	4	15	75%	V
	Availability of preface and table of contents	5	5	3	3	16	80%	V
	There are rules for practical instructions and their use.	5	5	4	3	17	85 %	SV
	The presentation of the bibliography is by the rules of Citation Mendeley Style American Psychological Association 7th Edition.	4	4	3	4	15	75%	V
	Availability of glossary and author biography.	4	5	3	5	17	85 %	SV
Average							78.3%	V

Table 4. Validation Test Results on the Language of Fungus Identification Practicum Instructions

Aspect	Indicator	Validator Score				amount	Average	Criteria
		1	2	3	4			
Language	The language used is easy to understand and does not have multiple meanings.	4	4	4	4	16	80%	V
	The language used is according to the EYD rules.	4	5	4	4	17	85 %	SV
Average							82.5%	SV

Table 5. Validation Test Results on Graphical Instructions for Identification of Fungus on Fruits

Aspect	Indicator	Validator Score				amou nt	Average	Criteria
		1	2	3	4			
Graphics	Typing accuracy	4	4	4	4	16	80%	V
	Accuracy in using images	4	5	3	4	16	80%	V
	Matching of references in sentences with numbering	4	4	3	5	16	80%	V
Average							80%	V

Table 6. Validation Test Results on Evaluations contained in the Practical Guide to Identification of Fungus on Fruit

Aspect	Indicator	Validator Score				amount	Average	Criteria
		1	2	3	4			
Evaluation	The suitability of post-test questions to the critical thinking skills indicators.	4	4	4	5	17	85 %	SV
	The questions presented can guide students to empower critical thinking skills	5	5	4	4	18	90%	SV
Average							87.5%	SV

Based on the validation assessment data for each aspect, the data is then recapitulated, which is then averaged to determine the level of validity of the flipbook-based mushroom identification practicum manual. The recapitulation data is presented in a table which can be seen in Table 7 as follows:

Table 7. Recapitulation of the Results of the Validation of Practical Instructions

No.	Validation aspect	Validator score (V)X				Total score ($X^{1)}$	Average (%)	Criteria
		V1	V2	V3	V4			
	Theory	20	21	17	21	79	79	Valid
	Presentation	25	27	20	22	94	78.3	Valid
	Language	8	9	8	8	33	82.5	Very Valid
	Graphics	12	13	10	13	48	80	Very Valid
	Evaluation	9	9	8	9	35	87.5	Very Valid
Total Score							407.3	
Average							81.5	Very Valid

Design valid practical instructions.

Based on the results of the research, the practical instructions for identifying mushrooms on fruit were developed using Flip PDF Professional software as a guide for implementing practical activities. Flipbook is a learning media that utilize multimedia technology that can be accessed directly via a computer or smartphone (Muhlas&Kontjoro, 2019). Utilization of applications as learning media development to support the learning atmosphere at home to create effective and efficient learning (Setiyo& Harlin, 2018).

Based on the results of the design of the practical instructions for the identification of mushrooms on fruit based on a flipbook which was arranged systematically consisting of 19 pages. The cover of the practicum manual is the initial part of the practicum manual, which refers to Figure 1. Next refers to Figure 2—namely the introduction and table of contents. The practical guide contains a table of contents that is useful for directing each section the reader is looking for. Based on figure 3. Chapter 1 introduction contains the rules, core competencies, indicators, objectives, and theoretical basis. Meanwhile, chapter 2 of the research methodology, which can be seen in Figure 5. contains the important parts contained in chapter 2 of the research methodology. These parts include tools and materials that refer to Figure 5, work steps that are systematically arranged to start from the preparation stage and the implementation stage can be seen in Figure 6 and Figure 7, the results of observations accompanied by work steps in observing research results are arranged according to the indicators of science skills which can be seen in Figure 9, and evaluation as a group assessment after the practicum activities referred to in Figure 10. Next, referring to Figure 10, there are post-test questions that function to train individual students' abilities. In addition, there is a glossary and bibliography in Figure 11, which is at the end of the practical instructions to provide knowledge for students. Based on Figure 12. That is a biography that explains the author of the practical instructions. The results of observations accompanied by work steps in observing the results of research arranged according to the indicators of science skills which can be seen in Figure 9, and evaluation as a group assessment after the practicum activities referred to in Figure 10. Next, refer to Figure 10 for the existence of post-test questions. which serve to train the ability of students individually. Besides that, there is a glossary and bibliography in Figure 11, which is at the end of the practicum instructions to provide knowledge for students. Based on Figure 12. That is a biography that explains the author of the practical instructions. The results of observations accompanied by work steps in observing the results of research arranged according to the indicators of science skills which can be seen in Figure 9, and evaluation as a group assessment after the practicum activities referred to in Figure 10. Next, refer to Figure 10 for the existence of post-test questions. which serve to train the ability of students individually. Besides that, there is a glossary and bibliography in Figure

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The results of the design are useful for making it easier for students to access it and quite simple for students to learn the practical instructions for identifying mushrooms on fruit-based flipbooks. This is supported by the statement of Setyo and Harlin (2018) that the development of flipbook-based learning media is very practical when applied in learning activities. In addition, the application of learning media using the kvisoft flipbook can influence the understanding of concepts in students so that students can learn independently (Mulyaningsih&Saraswati, 2017). According to Muhlas and Kuntjoro (2019) that the development of an e-book type flipbook based on scientific literacy obtained valid theoretical results with a percentage of 97.9% and empirically with a percentage of 85.3%.

Describe the validity of the practicum instructions that have been designed

Based on Table 7. The recapitulation of the results of the research validation obtained a value of 81.5%, which was declared very valid. These results are obtained from the total average of each aspect divided by the maximum number. This is in line with the opinion of Muhlas and Kuntjoro (2019) that the development of flipbook-type e-book media is said to be good if it gets an average score of 70%. In Table 2. The results of the validation test on the material aspects of the practicum instructions obtained a value of 79%, which was categorized as valid. The average is categorized as valid if the value is 60%. This shows that the material presented in the practicum guide must be adapted to the needs of students (Martinsen et al., 2019). Based on the development of flipbook-based learning media, it is good to apply because it is effective even though students learn independently (Hidayatullah&Rakhmawati, 2016; Setiyo& Harlin, 2018). The results of the validation test on aspects of presenting practical instructions referring to Table 3. obtained an average of 78.3%, which is categorized as valid. This shows that the practical instructions for identifying mushrooms on fruit-based flipbooks are presented systematically and can help and facilitate students and teachers in practical activities (Anggraini, 2016; Budiarti& Oka, 2017). This statement is supported by the research of Diani et al.(2018) that the presentation assessment obtained a value of 90%, which was categorized as very valid because the quality of the content and material of the product was as needed to improve student learning outcomes. Obtained an average of 78.3%, which is categorized as valid. This shows that the practical instructions for identifying mushrooms on fruit-based flipbooks are presented systematically and can help and facilitate students and teachers in practical activities (Anggraini, 2016; Budiarti& Oka, 2017). This statement is supported by the research of Diani et al.(2018) that the presentation assessment obtained a value of 90%, which was categorized as very valid because the quality of the content and material of the product was as needed to improve student learning outcomes. Obtained an average of 78.3%, which is categorized as valid. This shows that the practical instructions for identifying mushrooms on fruit-based flipbooks are presented systematically and can help and facilitate students and teachers in practical activities (Anggraini, 2016; Budiarti& Oka, 2017). This statement is supported by the research of Diani et al.(2018) that the presentation assessment obtained a value of 90%, which was categorized as very valid because the quality

of the content and material of the product was as needed to improve student learning outcomes.

Based on Table 4. The results of the validation test on the language aspect of the practicum instructions obtained a value of 82.5%, which was categorized as very valid. The language used must be easily understood by students and teachers because language is a channel of information (Sihafudin, 2020). The results of the validation test on the graphic aspects refer to Table 5. Where the graphic aspects relate to the use of pictures, tables, and numbering must be correct. The value obtained from the results of the validation test on graphics is 80% which is categorized as very valid. Thus, the combination of the use of images, tables, and numbering has met the requirements in terms of graphics (Lauren et al., 2016). In addition to the four aspects that have been mentioned, the developed practicum instructions are also supported by the evaluation contained in the practicum instructions, obtaining a score of 87.

CONCLUSION

Based on the results of the study, the practical instructions for identifying mushrooms on fruit-based flipbooks as a learning solution during the COVID-19 pandemic obtained a score of 81.5%, which was categorized as very valid. Where the value is obtained from the average assessment of the material aspect, which is 79% which is categorized as valid, the value of the presentation aspect is 78.3%, which is categorized as valid, the value of the language aspect is 82.5% which is categorized as very valid, the graphic aspect is 80%. Categorized as valid, and the evaluation scored 87.5%, which was categorized as very valid. Thus the development of flipbook-based learning media as a learning solution during the COVID-19 pandemic has met valid criteria which are expected to make it easier for students to carry out practical activities independently at home and become a challenge for teachers to innovate and be creative in creating new learning media. Suggestions from this study need product trials, namely practicality tests and effectiveness tests. The trial can be carried out online so that the product for the practical identification of mushrooms on fruit can be declared as a learning solution during the COVID-19 pandemic.

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