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DISSEMINATION OF GENERAL BIOLOGY TEACHING MATERIALS IN THE COVID-19 PANDEMIC

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ABSTRACT

General biology teaching materials are learning resources used by first batch students of all majors at the Faculty of Mathematics and Natural Sciences, Unimed. General Biology teaching materials based on current investigations, namely to respond to the industrial revolution 4.0 must be in accordance with the BSNP. This General Biology teaching material was validated by 2 lecturers who are in charge of the General Biology course. Dissemination to see the effectiveness of General Biology teaching materials through trials. The step was taken through a small group of 10 students who took the General Biology lecture, the result of which was to get an A grade of 80% and a B grade of 20%. The large group test of 43 biology students class of 2020 by giving a test, the results of which were 77% A, 21% B, and 2% C, means that the expected learning indicators have been achieved. General Biology teaching materials are distributed to General Biology lecturers. General Biology teaching materials are appropriate based on the National Education Standards Agency (BSNP).

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INTRODUCTION

Teaching materials have a vital role in learning activities so that students are helped in the efficiency of their learning time. Teaching materials consist of printed teaching materials and non-printed teaching materials, one of which is printed materials such as handbooks and or textbooks. Teaching materials are all forms of materials used to assist teachers/instructors in teaching and learning activities in the classroom (Prastowo, 2018).

Dissemination of general biology teaching materials is a continuation of research on the development of general biology teaching materials, which needs to be done to determine the usability and suitability of teaching materials with achievement indicators, which can be seen from the final grades of student's courses. According to Brata & Suriani (2018), students' scores in the good category amounted to 35%, 56% enough, and 9% less. According to Wulandari (2021), the practicum guide developed in the General Biology course is valid with a percentage of 86, which is in the range of 81 -100, and can be used in the General Biology practicum with the same material. Following the demands of learning in the era of the industrial revolution 4.0, general biology materials must be able to adapt teaching material materials that are in line with the standard indicators that students must achieve. The General Biology lecturer team strives to improve the general biology teaching materials. According to Fadilah (2019), it is necessary to develop a research-based general biology textbook for biotechnology materials that can be a good learning resource for students to understand the material in depth under learning outcomes and use a bioinformatics approach to apply biotechnology material in accordance with the development of science and technology. Based on the description above, the General Biology teaching materials that have been prepared need to be assessed for their feasibility before being printed in large quantities for students taking General Biology courses.

The development of General Biology teaching materials follows contextual learning. Based on the assessment of learning design experts has a value of 4,076, the assessment of material experts has a value of 4,090, based on the assessment by the supporting lecturer has a value of 4,190, and student assessments have a value of 4,030. If these results are converted to the validity criteria, then the valid criteria are obtained by Lepiyanto & Pratiwi (2015).

The dissemination should be carried out by printing General Biology teaching materials, then using them as teaching materials in small and large groups to determine the level of feasibility. However, due to the COVID-19 pandemic, this was not carried out, so students' teaching materials were in soft copy, and limited materials were uploaded to SIPDA.

Teaching materials for General Biology courses which contain material according to the demands of the industrial revolution 4.0, are not yet available at FMIPA Unimed. The teaching materials that Biology lecturers have prepared at the Faculty of Mathematics and Natural Sciences Unimed as General Biology supervisors refer to research and development (R & D) research. The development of teaching materials uses R & D research, which is one of the research methods used to obtain specific products and test their effectiveness (Sugiyono, 2015), continued dissemination.

Preparation of appropriate textbooks to be used as teaching materials really needs to be done to help students have accurate learning resources, the materials must be tied to the basic competencies that must be achieved, so that the breadth of the material is sufficient to achieve basic competencies or has various special provisions that must be applied in writing textbooks, then meet the standards of content and writing (Wulandari, 2016). According to Nurhasanah (2017) that the teaching materials developed can improve the quality of learning with an average pretest achievement of 65.76 and an average post-test score of 78.20, and the results of the assessment of lecture activities by observers on students who take part are obtained well. by 78%. According to Novallyan et al. (2020) that the General Biology E-module can effectively improve student learning outcomes and motivation.

METHOD

This research was carried out at FMIPA Unimed in 2020. The validation of general biology teaching materials was carried out by two validators of General Biology material experts, namely 1 UNIMED biology lecturer who was in charge of General Biology courses and one coordinator of general biology course lecturers and biology lecturers. General. Furthermore, the dissemination was carried out with a small group test of 10 students who had taken general biology courses and a large group test of 43 students majoring in Biology class 2020 at FMIPA Unimed, who were taking the General Biology course, consisting of 2 classes, namely 26 PSB 20 D class students and 17 PEPB 2020 class students.

Dissemination of General Biology teaching materials is the final step of research on developing appropriate teaching materials to be used in

General Biology lectures, which aims to determine the achievement of general biology learning indicators in lecture activities. Socialization to users/students is the socialization or distribution of teaching materials to lecturers and students. According to lectures during the pandemic, lecturers and students used soft copies of General Biology teaching materials, and dissemination and socialization were carried out. The scores obtained from the list of participants and final grades (DPNA) of students are then tabulated, and the percentage is calculated using the formula:

$$\textbf{Percentage} = \frac{\boldsymbol{Total\ acquisition\ value}}{\boldsymbol{Amont\ of\ students}}\ \boldsymbol{x}\ \mathbf{100\%}$$

The results of the data analysis are then interpreted into the eligibility criteria adapted from Akbar (2013), as presented in Table 1.

Table 1 Eligibility Criteria

Percentage	Category
81-100%	Very eligible
61-80%	Eligible
41-60%	Less eligible
21-40%	Not feasible
00-20%	Very Inappropriate

RESULTS AND DISCUSSION

Dissemination of General Biology teaching materials is adapted to the current pandemic situation. Tests on students' ability to master the general biology material are taught through student ability tests. Students' final grades, such as those in DPNA, can be used as a benchmark for achieving General Biology learning indicators. The tests/questions for evaluating the mid-semester examination (UTS) and the final semester examination (UAS) are made based on the test/question grid by referring to the indicators that students must achieve. Individual tests on ten students obtained an A score of 80% and a B value of 20%, with a very decent average. In the big group test, based on the DPNA, it can be seen that the percentage of student scores is: A grades up to 77%, B scores 21%, and C scores 2%. Of the number of lecture participants, as many as 43 students, one was found one person with an E score, meaning that there was one student from one class who did not pass. Based on the DPNA value, the general biology teaching materials are considered suitable for use because students' mastery of the UTS and UAS exams is good according to the student's final grades. The results of the analysis of General Biology material for the 2019/2020 academic year are presented in Table 2.

Table 2. General Biology Book Analysis

Analyzed Aspect	Percentage	Feasibility
Material Feasibility Aspect		
A. Material Suitability	70%	Feasible
B. Material accuracy	70%	Feasible
C. Renewal	75 %	Feasible
D. Encourage Curiosity	75%	Feasible
Aspects of Feasibility of Presentation		
A. Presentation Techniques, Sequence	75%	Feasible
B. Presentation Support	70%	Feasible
C. Learning Presentation	85%	Feasible
D. Coherence and Continuity of Thought	75%	Feasible
Aspects of Language Feasibility According to BSNP		
A. Straightforward	75%	Feasible
B. Communicative	75%	Feasible
C. Dialogic and Interactive	70%	Feasible
D. compatibility with students	75%	Feasible
E. Conformity with Language Rules	75%	Feasible
Aspects of Feasibility According to BSNP		
A. Size of Teaching Materials	70%	Feasible
B. Design of Teaching Material Content	70%	Feasible

According to the BSNP, the presentation feasibility aspect, the language feasibility, and the display feasibility aspect according to the BSNP each have a percentage of 70%, which is the percentage at the minimum standard level. General Biology teaching materials were analyzed based on the feasibility aspect of the material, the presentation feasibility aspect, the feasibility aspect according to the BSNP, and the display feasibility aspect according to the BSNP included in the appropriate category. In other words, the teaching materials that have been disseminated are suitable for widespread use.

The description of the results of the general biology book material analysis by a material expert stated that the material still needed to be completed and enriched. It was revised and completed so that the material was appropriate to achieve the expected achievement indicators.

General Biology teaching materials that need to be completed and enriched are those in Chapter 5 Bioenergetics, Chapter 8 Bio-Industry, Chapter 9 BioEngineering, and Chapter 10 Bio Communication. Because the teaching materials for each chapter are only 5 to 10 pages, the number of pages should be in each chapter is not too much different because it will affect the description of the material. Therefore the description of the material has been added. In terms of appearance, there are still many shortcomings. In general, the accuracy of the material, up-to-date, encouraging curiosity, presentation techniques, presentation support, learning presentation, coherence and sequence of thought flow, straightforward, communicative, compatibility with students as users, and conformity with language rules are sufficient. The suitability of the material, dialogical and interactive, the design of the content of the teaching materials is considered inadequate, and the size of the teaching materials is sufficient. Furthermore, the lack of general biology material mentioned above has been revised to be in the proper category.

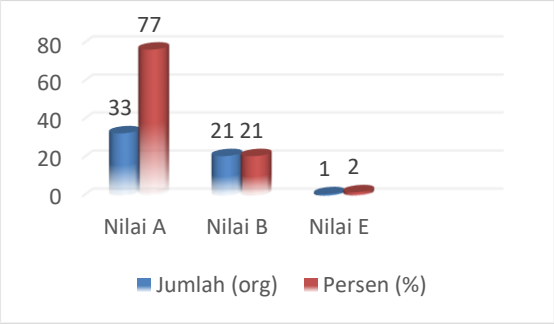

Figure 1. Percentage of General Biology Student Score

Based on the percentages in Figure 1, the highest percentage of students' final grades is in the B grade group. The number of students who got A and B grades was 42 people. Only one person got an E because the student only attended at the beginning of the lecture and did not attend the lecture until the end of the semester. Students who get grades A and B have completely mastered the learning material and can achieve completeness indicators. Dissemination is conducted following online lectures, where the subject matter is provided in soft copy. According to Simatupang & Siregar (2016) that, the assessment of material experts regarding the development of the General Biology practicum is based on aspects (1) Feasibility of the content of the results is 80.8%; (2) The result of linguistic feasibility is 81.9%. According to Juliana et al. (2016), the material expert's assessment of the validity of the Cell Biology textbooks was 93.15%, and the assessment of media experts was 88.64%. Likewise, according to Queen et al. (2019), student learning activities in Biodiversity increase accompanied by a strengthening understanding of science concepts after learning with the help of learning resources or media is carried out.

Another thing that needs to be considered is that the sentence structure must be able to describe the content of the message conveyed and not contain double meanings or irrelevant information Hasruddin et al. (2014). The percentage of microbiology module assessment by class XI students is 88.43%. These results indicate that the developed module is included in a feasible module qualification. The effectiveness of this module is seen from the gain score of 0.54 with moderate criteria, so it can be declared effective. The student response from the module by taking a small-scale test was 88.43%, with a very good response (Abdias et al., 2019).

The results of the dissemination of general biology textbooks for the 2019/2020 TP still require further research because student scores are not entirely based on the Mid-Semester Examination (UTS) and Semester Final Examination (UAS) results. Their test materials are based on the teaching materials used under the required indicators and achieved after learning.

CONCLUSION

This General Biology teaching material was validated by two lecturers in charge of the General Biology course. Dissemination to see the effectiveness of General Biology teaching materials through small group trials with ten students who have attended General Biology lectures. The results obtained were an A of 80% and a B value of 20%. In a large group test of 43 biology students class of 2020 who are currently following the General Biology lecture by giving a test, the result is an A value of 77%, a B value of 21%, and a C value of 2%. General Biology teaching materials are appropriate based on the National Education Standards Agency (BSNP), and the ISBN has been published, namely: ISBN 978-602-9115-86-4.

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