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RESEARCH ARTICLE

PRACTICALITY STUDENTS WORKSHEET BASED ON MASTERY LEARNING IN SEX-LINKED GENE MATERIAL.

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Abstract

Genetic subjects must be followed by every student the education program of Biology STKIP PGRI Sumbar in the fifth semester. In sex-linked gene material, there are concepts, sub-materials, and exercises that are difficult for students to understand. This is due to the students' habits that are only waiting for information from lecturers, students do not have independent study habits, and the unavailability student worksheet that can help student difficulties. This study aims to develop a practical student worksheet based on Mastery learning in sex-linked gene material. The type of research is 4-D models are defined, design, and development. In this research limited to development stage (practicality test) of student worksheet based on mastery learning in sex-linked gene material. Practicality test is done by the lecturer of genetic subjects and students. Based on the results of practical tests conducted by lecturer and students, the ease of use aspect shows practical criteria with 80% and 81.27%. Student worksheet based on mastery learning in sex-linked gene material is practically used for lecturers and students.

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Introduction:-

Biology is a science that can not be separated from facts, concepts, postulates, and principles relating to living things. In biology students are required to be able to master facts, concepts, propositions, and principles. Biology is a science that requires understanding, application, analysis, synthesis, and evaluation or high-level thinking (Lufri et al., 2007). Biology has various branches of science, such as microbiology, plant morphology, animal physiology, plant development, biochemistry, and genetic. Genetic subjects must be followed by every student of the education program of Biology STKIP PGRI Sumbar in the fifth semester. In genetic subject there are several materials, such as Mendel law, epistasis, gene interaction, probability theory, multiple allele, sex-determination, crossing-over, and sex-linked genes. In sex-linked gene material, there are concepts, sub-materials, and exercises that are difficult for students to understand. This is due to the students' habits that are only waiting for information from the lecturers, the students have no independent study habits, and the unavailability of student worksheets that can help student difficulties.

The student worksheet is a sheet instead of books containing guidelines for students to perform programmed activities (Dahar, 1995). The use of student worksheets aims to enable students to learn, help students find concepts through process skills approaches, and help lecturers plan appropriate learning activities based on student characteristics. Student worksheets can activate students and improve student learning outcomes (Toman et al.,

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2013). Student worksheet based on Mastery learning is a non-experimental student worksheet that aims to enable students to learn in the learning process they complete. Mastery learning is a learning approach based on a philosophical view that all learners can learn if they are supported by the right conditions (Ozden, 2008). Mastery learning focuses on the full student individualization in learning. Mastery learning can be used well if the learning objectives to be achieved are goals that include cognitive and psychomotor (Suhartini, 2007). The concept of Mastery learning is a learning process that aims to teach the material is mastered completely. Mastery learning can improve effectiveness in the learning process (Kazu et al., 2005). In the learning process can be used teaching materials, such as modules, handouts, dictates, and student worksheet.

Therefore, a student worksheet based on Mastery learning has been developed that is practical on sex-linked gene material. Student worksheet based on Mastery learning will produce interactive-educative that active, productive, and conducive between students and lecturers. This study aims to develop a Mastery learning-based student worksheet that is practical on sex-linked gene material. Student worksheet based on mastery learning can develop students' potential so that students have comprehensive, complete, and complete competence in learning on the sex-linked gene material.

Research Methods:-

This research was conducted in the odd semester 2017/2018 on Biology education department in STKIP PGRI Sumbar. The type of research is 4-D models (Trianto, 2010) are defined, design, and development. In this research limited to development stage (practicality test) of student worksheet based on mastery learning in sex-linked gene material. The student worksheet based on mastery learning practicality test is carried out by lecturers of genetic subject and students who follow genetic courses. Practicality test aims to determine the level of practicality of products that have been made. The level of product practicality can be known from the questionnaire of practicality test that will be filled by lecturers and students. Product practices can be demonstrated in the form of responses, such as interest, clarity, and ease of students understanding the components of the developed student worksheet based on Mastery learning.

Results and Discussion:-

Practical data of student worksheet based on mastery learning on sex-linked gene material was obtained through a questionnaire of lecturer and student response. The result of the practical test of students worksheet based on Mastery learning by lecturer and students shows that student worksheet based on Mastery learning in sex-linked gene subject is in practical criteria (Tables 1 and 2).

Based on the results of practical tests conducted by lecturer and students, the ease of use aspect shows practical criteria with 80% and 81.27%. This is caused the student's worksheet can be used repeatedly and can be used even if there is no lecturer. This can happen because the instructions for using the student's worksheet are easy to understand. The characteristics of a learning media, that is independent, in the sense of providing convenience and completeness of the contents in such a way that the user can use without the guidance of others (Ginanjari, 2010).

Table 1:- Practical test results of student worksheets by lecturer

Aspects	Item	Assessment of lecturer	The value of practicality (%)	Criteria
Ease of use	1-5	16	80	Practical
Time required in execution	6-7	6	75	Quite practical
The appeal of worksheet on student interest	8-12	16	80	Practical
Ease in interpreting	13-15	11	91,67	Very Practical
Has the same equivalent	16	3	75	Quite practical
Average			80,33	Practical

Table 2:- Practical test results of student worksheets by students

Aspects	Item	The value of practicality (%)	Criteria
Ease of use	1-7	81,27	Practical
Time required in execution	8-9	79,93	Practical
The appeal of worksheet on student interest	10-12	75,50	Quite practical
Ease in interpreting	13-14	79,93	Practical
Has the same equivalent	15-16	84,09	Practical
Average		80,14	Practical

The time aspect required in the execution shows practical and practical criteria with 75% and 79.93% judgments. This indicates the student's worksheet can save the lecturer time in explaining genetic material because it does not require a long time like explaining the material without using the student worksheet. An aspect of device appeal to student interest has practical and quite practical criteria with 80% and 75.50%.

Aspects of ease in interpreting the material show very practical and practical criteria with an assessment of 91.67% and 79.93%. This is caused the student's worksheet can be a facilitator between lecturer and students. This is in line with the opinion of (Arsyad, 2011). which suggests that the function of learning media is able to explain the presence of messages and information so as to accelerate and improve the learning process, learning media can improve and direct the student's attention so as to generate student learning motivation.

The same equivalent aspect represents a fairly practical and practical criterion with an assessment of 75% and 84.09%. This is caused the material used in accordance with the standards of competence, basic competencies, indicators and learning objectives that have been formulated so that the material on this student worksheet can represent all the material that has been studied.

The results of the assessment state that the student worksheets that researchers develop useful in the learning process, both for lecturers and for students. Benefits gained for lecturers, which can assist lecturers in providing a correct explanation of the concepts in the genetic material to students. The advantages of learning media one of them raise the perception of a similar concept (Trianto, 2010). The clarity of instruction in the learning media, the suitability of the content on the learning media, the preparation of the material on instructional media, the suitability of the material with the learning media, the harmony of the colors, the appearance of the drawing, the writing on the material, and the custom of the language used can help understand the material (Sukiman, 2012). Genetics student worksheet was fairly effective to develop creative thinking skills regarding to the increased test score and creative thinking achievement indicator, positive self-assessed creative thinking capability from the students, and positive student response to lecturer's ability to develop creative learning activities (Susantini and Lisdiana, 2016).

Mastery learning approach, any teacher can help all the learners to learn excellently, speedily and self-confidently. Mastery learning believes that it can be that it can be initiated and instigated simply by transforming conventional group and teaching-learning process to make sure that some students need more time and they receive proper additional teaching according to the result of the formative evaluation (Bloom, 1974). Mastery learning provides an influential and powerful new approach to student learning which can provide almost all students with the successful, effective and rewarding learning experiences (Mehar and Rana, 2012).

Conclusion:-

Based on the results of practical tests conducted by lecturer and students, the ease of use aspect shows practical criteria with 80% and 81.27%. Student worksheet based on mastery learning of sex-linked gene material is practically used for lecturers and students.

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