



## VALIDITY TEST OF HANDOUT BASED ON MINDMAP IN BIOLOGY LEARNING STRATEGY AND DESIGN SUBJECT

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### Abstract:

Students have not been able to understand the biology learning strategy and design materials well because not in accordance with the expected learning achievement. The lack of students' ability in mastering lecture material because almost all materials are applicative so that students find it difficult to apply the concept of lecture material when given assignments. The lecturer does not have teaching materials that are designed according to the learning achievements. Lecturers and students only use learning resources from books sold in the market. This subject is one of the subjects that provides students with the opportunity to plan, implement and evaluate classroom learning. The purpose of this study was to develop handouts based on mind map is valid. This type of research is research and development using ADDIE models consisting of five stages, namely Analysis, Design, Develop, Implementation and Evaluation. The results showed that handouts based on mindmap that had been developed were considered very valid with 96% validity value so that they could be used by students of the Biology Learning Strategy and Design subject.

**Keywords:** validity, handout, mind map, biology learning strategy and design subject

### 1. Introduction

Biology learning strategy and design subject are one of the compulsory subjects for students of biology education department at STKIP PGRI Sumatera Barat. This subject provides students with the skills to plan, implement and evaluate classroom learning. The material on biology learning strategies and designs discusses strategies, approaches, methods and learning models and makes learning tools (syllabus, annual

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programs, semester programs, learning implementation plans, remedial programs and enrichment programs).

Based on the results of the interviews and the results of the reflection of the lecturers in the subject on Biology Learning Strategy and Design shows that there are several problems found during the lecture, namely the lack of students' ability in mastering lecture material because almost all materials are applicative so that students find it difficult to apply the lecture material concepts when given assignments. Lecturers do not have teaching materials that are designed by themselves according to learning outcomes. During this time, lecturers and students only use learning resources from books sold in the market so that students have not been able to understand the lecture material properly because it is not in accordance with the expected learning outcomes.

Overcoming this, teaching materials are needed in the form of handouts based on mindmap that can help students in understanding the material in the biology learning strategy and design subject. The handout is a very concise learning material sourced from kinds of literature relevant to basic competencies and materials taught to students (Prastowo, 2012). Mindmap is a to manage information as a whole (Buzan, 2005). Mindmap is able to improve students' ability to imagine, remember, concentrate, make notes, increase interest and be able to solve problems (Ertikanto, 2016). The aim of the study was to develop handouts based on mindmap in biology learning strategy and design subject. Handout based on mindmap on strategy and design biology learning subject can help students in understanding the course material and apply the knowledge they have after being a teacher.

## 2. Material and Methods

This type of research is research and development using the ADDIE model. The ADDIE model consists of 5 stages, namely analysis, design, development, implementation, and evaluation (this study is limited to the development stage /validity test). Research stages:

1. Analysis, the analysis stage is carried out:
  - a. syllabus analysis
  - b. literature analysis
  - c. student character analysis.
  - d. interview with lecturers of biology learning strategy and design subject
2. Design, at the design stage, is carried out:
  - a. cover of handout design
  - b. material design
  - c. mind map design
  - d. designing questions
3. Develop, at the developing stage is done:
  - a. the validity test of the handout by two validators
  - b. analysis of the results of the validity test

### 3. Results and Discussion

The results of the study show that the handouts that have been developed is valid criteria, as can be seen in the following sections.

#### 1. Analysis stage

##### a. Analysis of syllabus

At this stage, an analysis of the syllabus is carried out in the biology learning strategy and design subject. Syllabus analysis is done to find out the suitability of the material taught with the expected competencies. Based on the results of the syllabus analysis it is known that the competency standard of this course is that students are able to master the understanding of strategies, methods, models, and approaches, knowing the basic principles of learning, the code of ethics of teachers and analysis of subject matter. Make annual programs and semester programs. Mastering learning approaches and methods. Mastering learning models, mastering basic teaching skills, designing instructional materials, syllabus and learning plan, making remedial program design and enrichment.

##### b. Analysis of literature

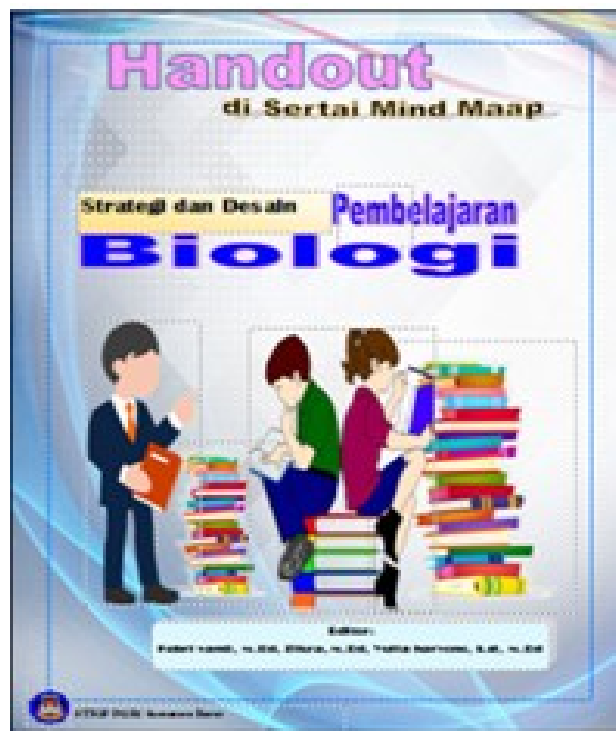
Analysis activities are activities carried out to collect materials related to the design of handouts. The hallmark of the module that will be developed is a handout with a mindmap. Mindmap benefits according to Buzan (2005) are planning, communicating, being creative, saving time, solving problems, focusing attention, absorbing and explaining thoughts, remembering better, learning faster and more efficiently and seeing the whole picture.

##### c. Analysis of student characteristics

Based on the observations that have been made, it is known that the learning method of students of Biology education department STKIP PGRI Sumatera Barat has not been active, students are difficult to understand the material because the learning resources used from books sold in the market, lack students' ability to apply the concept when given assignment because almost all lecture material strategies and biology learning design are applicative, students are less motivated in learning because the concept of material obtained has not been focused on the learning objectives.

#### 2. Design stage

At the design stage, the cover of the handout has been designed which includes the handout title, the author's name, and the year of publication (Figure 1). The material was designed as many as 8 materials adapted to the syllabus of the Biology Learning Strategy and Design subject. Mindmap is designed to be adapted to the Biology Learning Strategy and Design subject material and the method for making mind maps by Buzan, 2005. According to Heriadi (2015), the application of mind maps in Biology learning can increase student learning activities and outcomes.



**Figure 1:** Cover of handout

Mind map is a form of an outline with ideas and pictures radiating out from a central concept with hierarchies and associations that stem from a central image in a free-flowing, yet organized and coherent manner (Budd, 2004). Designing questions of handouts based on mindmap are guided by the learning objectives of each material. The provision of questions for each material aims to test the ability of students after learning the material given.

### 3. The developing stage

The developing stage is the stage of developing the handout by the validity test of the product by two validators. The results of validity test handout based on the mindmap in the Biology Learning Strategy and Design subject are classified as very valid criteria with a validity value of 96% (Table 1).

No	Components	Rating		Value Validity (%)	Category
		Validator 1	Validator 2		
1	Handout	4	3.6	95	Very valid
2	linguistics	4	4	100	Very valid
3	Integrity	4	3.8	98	Very valid
4	Mindmap	4	3.3	91	Very valid
Total value			3.7	96	Very valid

A learning device is categorized as very valid if it has a 90-100% validity value (Purwanto, 2007). Although the criteria are very valid in terms of material, there is some material that must be revised according to the advice of the validator. But in general, the material contained in the Handout has referred to the competency standards

contained in the semester learning plan and syllabus. The same research results were also carried out by Wati et al, 2018 where the results of the concept map-based module validation in the course of Evolution were in very valid criteria, namely 92.18%. Validation results of Android-based Handouts on Physics subject matter are in very valid criteria (Hanifah et al., 2016). In contrast to the results of the validity test of the students' worksheet based on Mastery learning in Genetics subject is valid criteria with a value of 88% (Megahati et al., 2016). Based on the results of research that have been obtained that Handout Based on Mindmaps in the Biology Learning Strategy and Design subject, it has been very valid so that it can be used by students of the Biology Education program STKIP PGRI Sumatera Barat.

#### **4. Recommendations**

Subsequent research will be carried out on the practicality, effectiveness, and disseminate tests of handout based on mindmap in the biology learning strategy design subject.

#### **5. Conclusion**

The results show that handouts based on mindmap that have been developed are considered very valid with 96% validity value so that they can be used by students of the Biology education department STKIP PGRI Sumatera Barat.

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