

# The Practicality of Teaching Materials Supplements for Growth and Development Materials Based on Drought-stressed Plants

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**Abstract:** The purpose of this study is to decrypt the practicality of teaching material supplements for growth and development materials based on drought-stricken plant studies. This research includes development research using the ADDIE development model which consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation, with the test subjects involving 20 students from class XII science of SMA Negeri 4 Gorontalo in 2022/2023. Practicality is a stage of development research. The instrument used in the practicality of teaching material supplements is measured by the implementation of learning, student activities, and student responses. The results showed that the implementation of learning reached 100%, at meeting 1 and meeting II it reached 100 % with excellent categories, student activity with 76.87% good categories, and student responses with 88.07% with excellent categories. Thus, the supplement of teaching materials for growth and development materials based on the study of drought-stricken plants is practically used in the biology learning process on growth and development material.

**Keywords:** Growth and Development; Practicality; Teaching Ingredients Supplements

## Introduction

Education is very important in the life of every human being, every human being deserves an education and hopes to always develop in education. The development of education is in line with the development of human life itself. For this reason, the Indonesian government always tries to make changes that have an impact on the educational curriculum. Education plays an important role in growing and developing the potential that already exists in humans through teaching and learning activities. According to Fauzan (2019), the position of teacher is very important in education in educating their student. The current 2013 curriculum is more student-centered so there is a need for learning tools that spur students to be more active in learning, especially in biology subjects.

Biology is a science that studies living things and the environment from various aspects of the problem. Sudarisman (2015) states that biological matter

is not only related to facts but also related to abstract things and objects such as metabolic processes, hormonal systems, coordination systems, and others. According to Suryanda et al. (2016), that high school biology learning, both theory, and practice, requires learning resources that support students to understand biology material.

Khanifah et al (2012), revealed that learning resources are everything that can share student comfort in getting various insights, information, and skills in the teaching and learning process. Grow and development material is material that discussed how plants grow and develop and how the factors influence it. One of the factors that inhibit growth is drought suppression. Drought stress is a condition and situation where the planting media area does not find enough water, so plants cannot grow and develop in a maximum way and can cause production shrinkage. According to Akram et al. (2013), drought can cause the rate of photosynthesis to slow down significantly across

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growth stages. Drought can cause anatomical, morphological, physiological, biochemical, and molecular changes in plants (Rosawanti, 2016). So based on this, there is a need for attention in the world of education to provide knowledge about drought stress to the environment in their environment.

Based on the results of an interview with a biology teacher at SMA Negeri 4 Gorontalo, the biology learning process, especially growth and development materials, still uses general package books, as well as plant experiments on the influence of external factors are very easy to do but the fact in the field of these activities is still rarely carried out, as well as students' lack of understanding of what factors can affect plant growth and development. Based on the above problems, researchers are interested in conducting a study entitled "Practicality of Supplementation of Teaching Materials for Growth and Development-Based Studies of Drought-Affected Plants."

**Method**

This research was carried out in August–November 2022 in class XII science of SMA Negeri 4 Gorontalo. This study used the ADDIE development model. The instruments used in this study are the implementation of learning, student activities, and student response questionnaires.

*Learning Execution Analysis*

This analysis is used to assess the teacher's learning evaluated according to the criteria created. Observations use "Yes" score 1 and "No" score 0. The analysis data is obtained using the formula:

$$\text{Percentage (P)} = \frac{\text{Number Of Answer Score Yes}}{\text{the many aspects to observe}} \times 100 \quad (1)$$

**Table 1.** Learning Execution Category Table

Percentage of Deliverability (%)	Category
P > 90	Excellent
80 < P < 90	Good
70 < P < 80	Enough
60 < P < 70	Less
P < 60	Very Less

Yazid, 2016

*Learner Activity Analysis*

Through the activities of the learners as a whole. The assessment of student activities is in the form of a checklist with scoring using a scale of 1 - 4. 4= Excellent, 3= Good, 2= Enough, 1=Less. The following formula is used to calculate student activity.

$$\text{Student Activity Analysis} = \frac{\text{total score obtained}}{\text{maksimum score}} \times 100\% \quad (2)$$

**Table 2.** Categories Assessment of learner activities

Criterion	Percentage of Student activity (%)
Very Less	0-20
Less	21-40
Enough	41-60
Good	61-80
Excellent	81-100

Riduwan, 2018.

*Analysis of Learner Response*

Analysis of student responses aims to find out students' opinions regarding products that have been developed to produce a decent device. The results of the student's answers were afterward analyzed using the Gutman scale.

**Table 3.** Eligibility criteria for student questionnaires

Answer	Score
Yes (Y)	1
No (T)	0

Source: Mods (Sugiyono,2019)

Then, the score of each student's response is calculated using the formula:

$$P = \frac{\text{total score Yes}}{\text{maksimum score}} \times 100\% \quad (3)$$

The results of the calculation of the student response questionnaire presentation are presented in the following table criteria.

**Table 4.** Intrespretation Student questionnaire scores

Criterion	Average Score (%)
Excellent	81. 25 -100
Good	62.5 – 81.25
Not good enough	43.75 – 62.5
Bad	25- 43.75

Source: Sugiyono, 2019

**Result and Discussion**

Based on the results of the research obtained, namely the practicality of supplementing teaching materials for growth and development materials based on the study of plants that are choked by drought.

*Implementation of Learning*

The implementation of learning is carried out in the learning process by providing a checklist (√). The results of the observation of the implementation in the limited-scale trial with reference to 11 aspects observed. The results of the implementation analysis show very good criteria.

**Table 5.** Recapitulation of Learning Outcomes

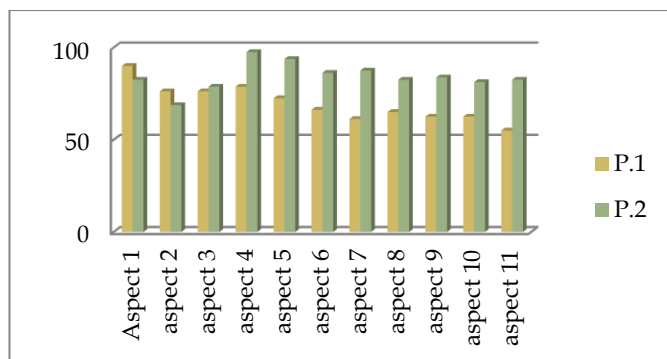
Meeting	Percentage %	Average
I	100	100 %
II	100	

In the assessment of the implementation of learning is very important because it is related to the achievement of the learning process in the classroom. Learning is said to be successful if the implementation of learning carried out in class XII science<sup>3</sup> for 2 meetings gets an average result of 100% meaning that the learning process is carried out well so that it can be said to be practical learning and obtain good categories. According to Rohmatullah et al. (2013), a learning device can be said to be practical if the implementation of learning in class reaches 80%.

According to Fatmawati (2016) that the skills needed to carry out the teaching and learning process are the activeness of teachers in producing and expanding learning in accordance with the concepts that have been prepared. This is in line with the research of Wicaksono and Siswanta (2021) that the implementation of learning reaches 80% including very good criteria and is said to be practical, obtaining these results because the learning process meets the criteria so that the learning process gets very good results.

*Student Activities*

Student activity is one of the important factors in the implementation of learning. Analysis. The percentage of student activity results is seen in the following graphic image. The results of the assessment of student activities showed an average score of 76.87 good categories, this is in line with the opinion of Afsani et al, (2016) that the results of observations of student activities during the learning process with an average percentage of 75.10% show that student activities are in a good category.



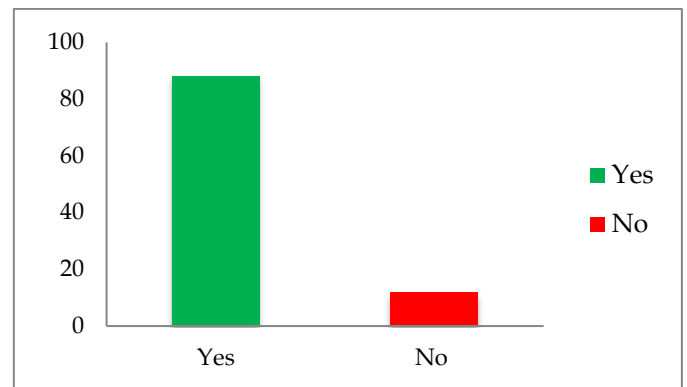
**Figure 1.** Percentage of student Activity

The activity of students at meeting 2 was increased compared to meeting 1. This is because learners conduct simple experiments directly. According to Hasmiati, et

al (2017) that experimental activities can help understand the theory they are studying. However, some aspects need to be improved in the activities of learners.

*Student Response Questionnaire*

The analysis of learners' responses can be seen in the analysis graph image.



**Figure 2.** Analysis of Student Response Questionnaires

The results of the questionnaire analysis on the use of teaching material supplements for growth and development materials based on drought-beaten plant studies were distributed to 20 people. The response result was 88.07% of the criteria was very good and gave a positive response to the supplement of teaching materials for growth and development materials based on drought-beaten plant studies. According to the student, supplementary teaching materials based on plant studies that are gripped by drought already use clear and easy-to-read letters and pictures that make it easier to understand learning material and can add information to students' knowledge. This is in line with the opinion according o Hafsah (2017) that research in learning can increase students' knowledge and can improve the quality of learning. The results of the students' responses illustrate that the teaching material supplements developed have fulfilled the practicality aspect. This is in line with the research of Gaol (2019), that the results of student responses reached 80% leading to a positive response to teaching materials. Another opinion was also expressed by Sujarwinanti et al. (2020) that the tabulation results of students with a percentage of 63 % with good criteria can show that responses obtained by students are at a good practical level.

**Conclusion**

Based on the results of research and discussion, it can be concluded that the supplement of teaching materials for practical growth and development

materials is used in the learning process of plant growth and development biology.

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