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# Development of Integrated Biology Learning Modules on Local Potential of Padang Lawas Karamunting Plants (Rhodomyrtus tomentosa) as Biology Teaching Materials

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**Abstract:** This study aims to determine the validity, practicality, and effectiveness of the integrated biology learning module of the local potential of the Karamunting plant (*Rhodomyrtus Tomentosa*) for learning activities on Plantae material. This study uses Research and Development (R&D) research methods based on the Thiagarajan methodology with four stages, namely define, design, development and disseminate stages. This research was carried out from July-September 2021 with a research sample of 32 students of class X. The results showed that the percentage of the validity of the assessment by material experts was 87%, media experts was 70%, and the practicality test of biology teacher responses (field practitioners) was 92 % and student responses of 92%. Meanwhile, the results of the test scores for the effectiveness of the biology learning module were proven to increase up to 100% and were able to improve student learning mastery. So, it can be concluded that the integrated biology learning module of the local potential of the Karamunting plant (*Rhodomyrtus Tomentosa*) as a biology teaching material for class X MAS NU Siborong-borong is valid and effective for learning activities.

**Keywords:** Biology Learning Module, Local Potential, Karamunting

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## INTRODUCTION

Education is education that brings students to an impressive learning experience for themselves after that this experience will impress students and apply them (Satriawati, 2019). The conflict that occurred at this time was the impact of the waning of local potential values that grew in the community and was a result of globalization. Whereas the existence of an ethos that comes from local potential is very meaningful because the basic cultural values contained in local potential can be used as studies in education with the aim of increasing the quality of education, namely the implementation of the 2013 curriculum. The local potential of the cultural environment, economic conditions, and regional needs with self-developed competency standards and basic competencies so that the learning process is more meaningful.

Referring to the Minister of National Education Regulation above, educators can link biology material by aligning it with the characteristics of the community's cultural potential so that students can easily understand it. In this regard, the introduction of local potential that has the use and preservation of everything that exists in nature is very important to be introduced through learning.

Local potential is a potential that has long emerged in a certain area as a result of interaction with the natural environment (Njatrijani, 2018). Local potential can also be interpreted as one of the treasures of the nation's cultural wealth that deserves to be preserved (Andriana et al., 2017). Education in biology subjects can be done considering that biology is a subject that is closely related to the surrounding environment (Shufa, 2018). But if the biological material is explained by the lecture method, it will be very boring, for example, Plantae (plant world) material. However, if the material discusses the structure of the plant body and its benefits for society carried out in class, it will be boring for students (Anderson et al., 2013). Therefore, the existence of teaching materials that contain information on local potential culture can help students to understand the learning materials will be more meaningful and students can find out the potential of local culture in the area where they live (Budiarti & Harlis, 2020; Ramdiah et al., 2020; Wulandari & Djukri, 2021; Yuliana et al., 2017)

The module is a book that is deliberately written with the aim that students can learn independently without or using the guidance of educators (Nurdyansyah, 2018). The development of this biology module integrated with local potential is still not widely used in the learning process in schools (Haka et al., 2020; Putri & Aznam, 2019). One of them is

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Private Islamic High School NU Siborong-borong, Indonesia. In accordance with interviews and observations given personally, students only use textbooks in the learning process. In the textbooks there are not so many pictures that clarify the material and are not accompanied by colors so that they are considered unattractive. Then the material contained in the textbook is general and does not have connection with the daily life of students.

Based on the explanation above, it is necessary to develop teaching materials to introduce local potential, the researchers will carry out research with the title "Development of Integrated Biology Learning Modules on Local Potential of Padang Lawas Karamunting Plants *(Rhodomyrtus Tomentosa)* as Biology Teaching Materials ".

## METHOD

The R and D method is the process of forming a product and testing the effectiveness of the product (Rumetna et al., 2020). According to (Sugiyono, 2020), to test the effectiveness of the product for its use so that it can function in the wider community, research is needed to test the product's effectiveness. This research was designed using *Research and Development,* and the development design followed the path of Thiagarajan. The 4-D development model stages are *Define, Design, Develop*, and *Disseminate*. The steps for using the *Research and Development* are as **Figure 1**.

This development is limited to the development phase *disseminate* phase is not implemented. However, in this study, the distribution and socialization were carried out only in the form of class samples.

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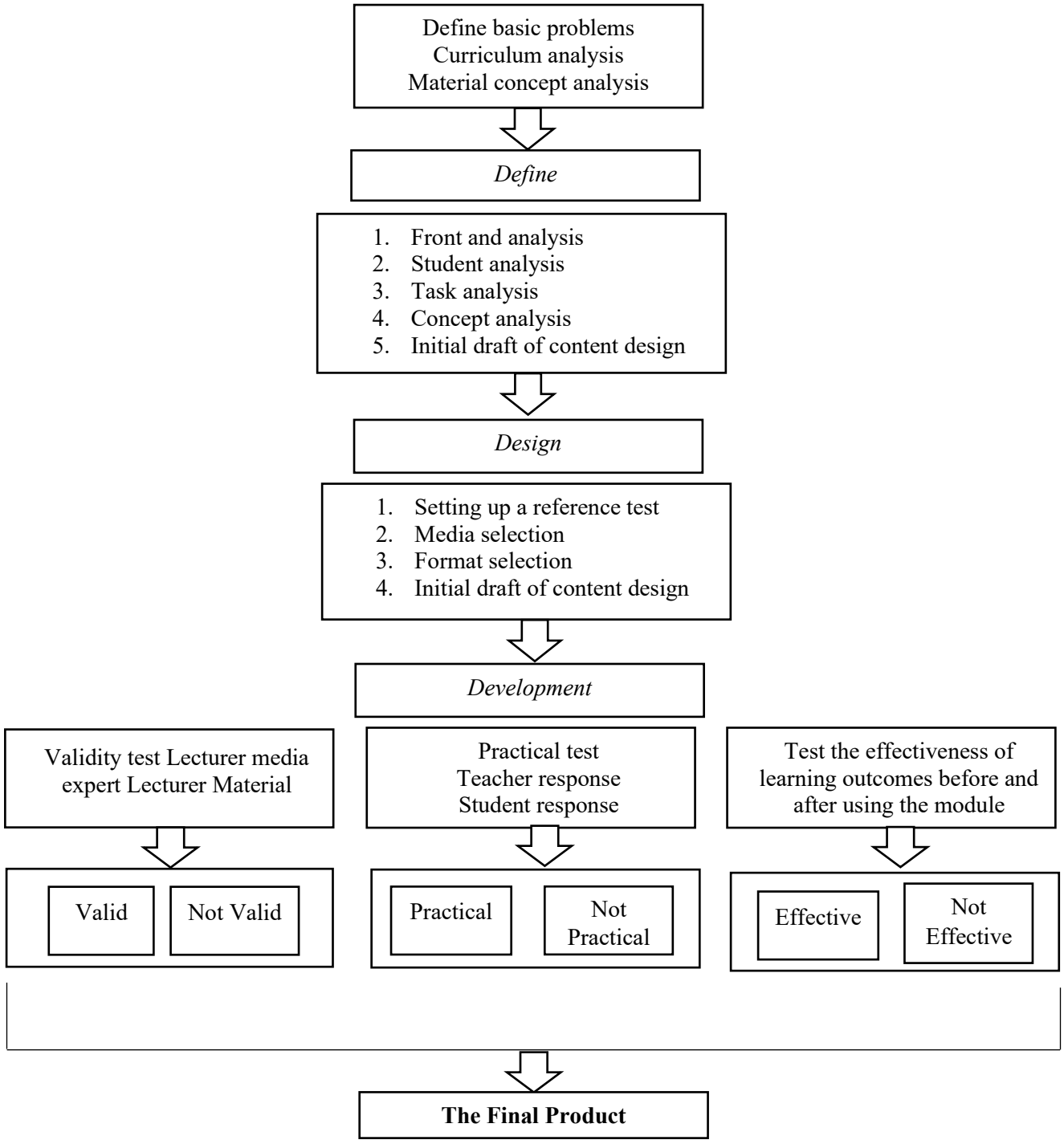



**Figure 1.** Steps for the use of the research and development (R&D)

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## FINDING AND DISCUSSION

This research resulted in an integrated biology learning module product for the local potential of the Karamunting plant *(Rhodomyrtus Tomentosa)*.

### Finding

*Defining Phase (Define)*

The define is a way to decide and define the criteria needed for learning development. (1) Front End Analysis, analysis Front end analysis means deciding the basic problems faced by students in the biological learning process on plantae material by using the needs analysis method using interviews with biology subject teachers; (2) Student Analysis, analysis of students obtained by giving questionnaires and interviews to students aims to analyze the problems that occur during the learning process in class; (3) Task Analysis, task analysis is a combination of procedures for determining the content in a lesson in outline form only; (4) Concept Analysis, conceptual analysis carried out is firstly an analysis of core competencies (Kompetensi Inti) and basic competencies (Kompetensi Dasar) of plantae material in accordance with the 2013 curriculum; and (5) Formulation of Learning Objectives, the formulation of learning objectives is mandatory and becomes the subject of learning activities, namely the stage of formulating learning objectives to be taught.

*Planning Phase (Design)*

The planning phase (design) is a product planning activity that is developed. (1) Develop Reference Test, this test is a tool to measure the occurrence of behavior in students after teaching and learning activities are carried out. The test designed is in the form of a posttest; (2) Media Selection, researchers made using Microsoft word 2007, Corel Draw, and Photo Shop. Microsoft Word to design the module content and color parts of the module, Corel Draw helps to make module designs more attractive, and Photo Shop to edit and manipulate images in the module; (3) Format Selection, format selection is tailored to the needs and to make it easier for students to learn the material and provide additional knowledge; and (4) Initial Design, this initial design aims to determine the design concept of the product being developed.

*Development Phase*

The development phase aims to produce the final product form after making revisions based on expert input and test data. This phase consists of: (1) Test Validity (Material Expert Test and Media Expert Test), Expert who analyzes the material content of the module created.

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The part that was revised by the material expert was to make a classification drawing of plantae starting from *Bryophyte, Pteridophyte.* The following are some improvements that exist in the material content section of the module as in **Figure 2**.

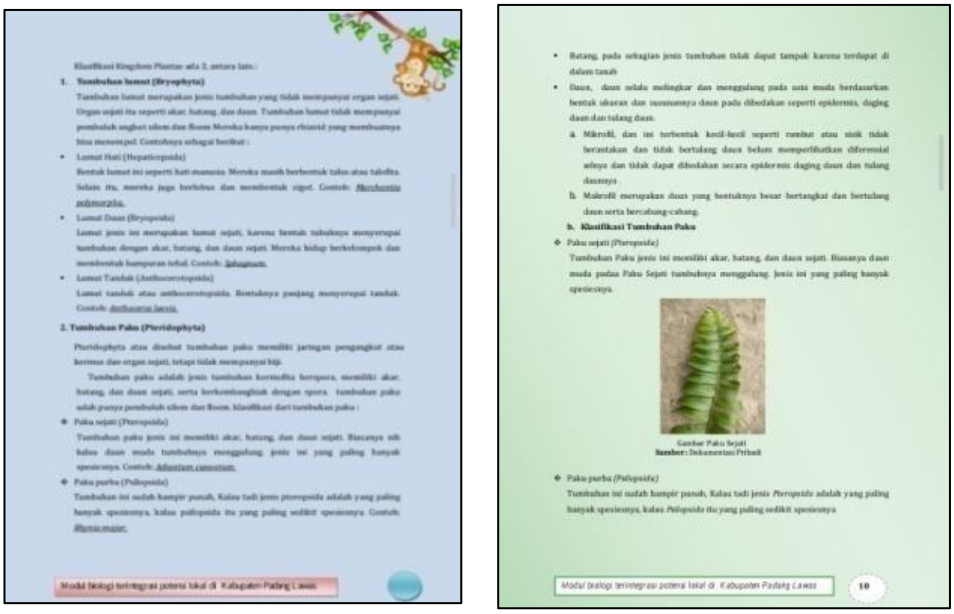


**Figure 2.** The section before the revised display of classification plantae materials *Bryophyte, Pteridophyte*

At the media expert test stage whose purpose is to assess the design of the learning module The revised section on this media expert validation is the front cover and back cover of the module. The cover of the module after revision as shown in **Figure 3**.

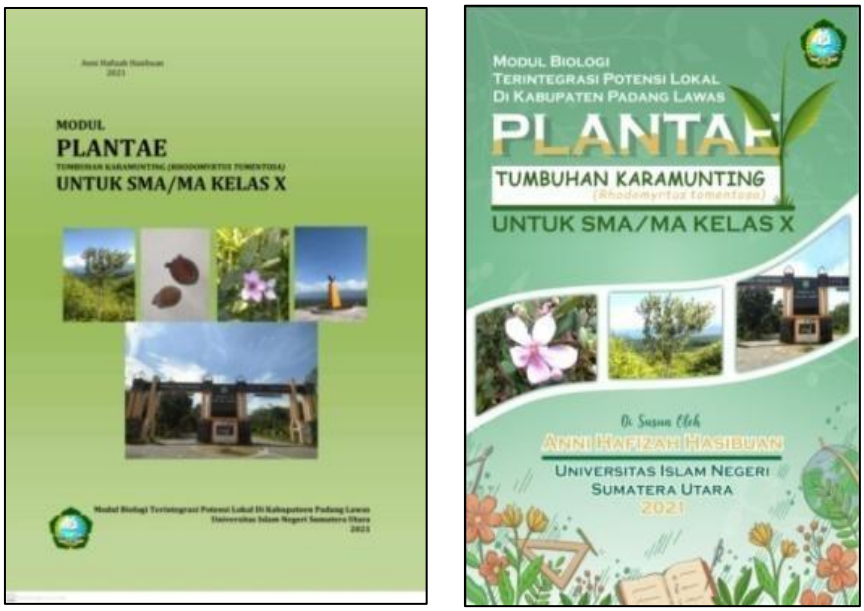



**Figure 3.** Front cover section before and after

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Then tabulation of the assessment results from material experts and media experts can be seen in the **Figure 4**.

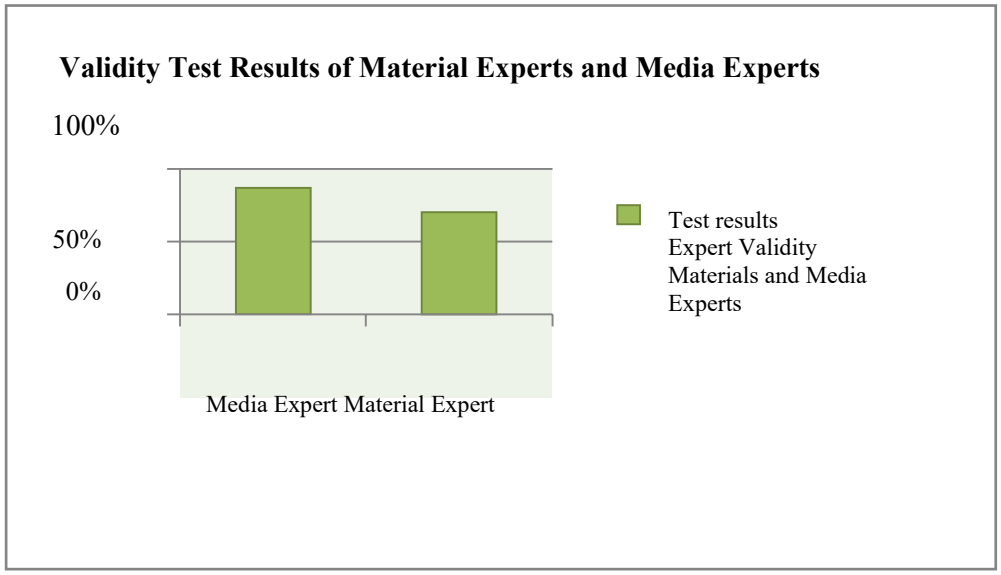



**Figure 4.** Percentage of learning module validation from the assessment of material experts and media experts

The practicality test was tested based on the teacher's response and the student's response to the biology learning module. The percentage of teacher and student responses to the module is shown in **Figure 5**.

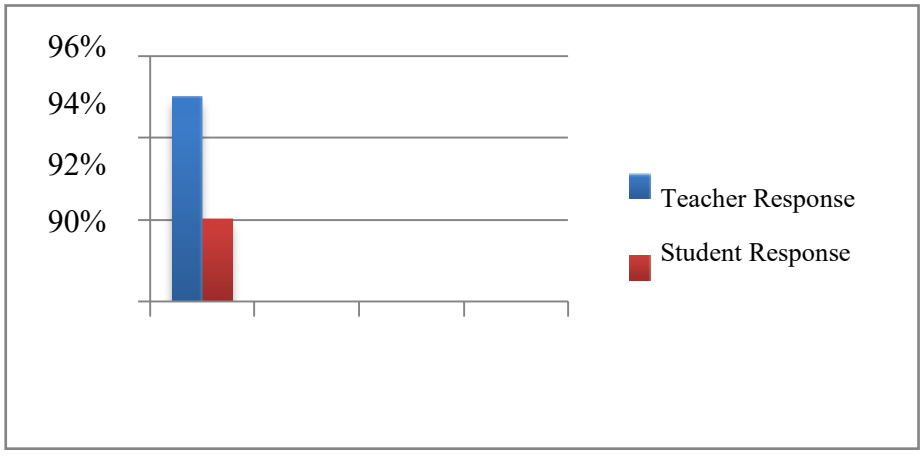



**Figure 5.** Practicality of teacher's response and student's response

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At the test phase, the effectiveness is measured based on student learning mastery before and after using the learning module. Percentage of student learning completeness is shown in **Figure 6.**

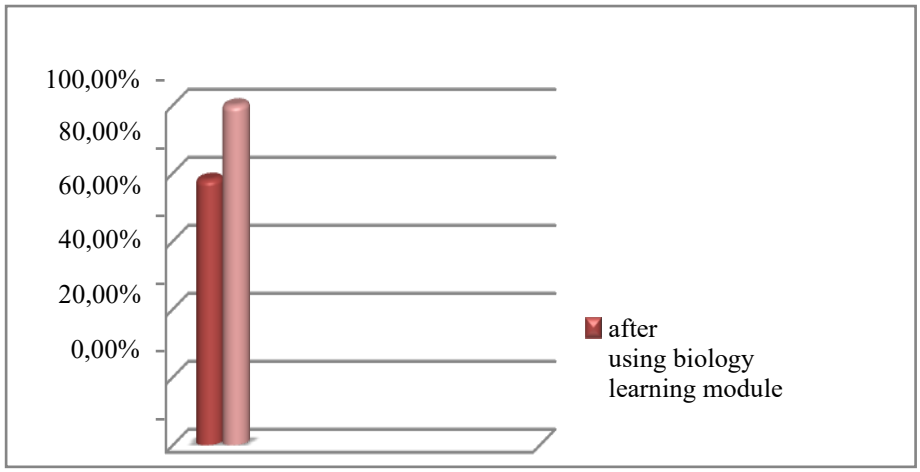



**Figure 6.** Percentage of student learning completeness

**Discussion**

Starting from the conflicts faced by students regarding the less innovative learning process and the lack of utilization of local resources for learning media. Students need learning media that contains observations. The learning resources needed must also make it easier for students to find out the material. For this reason, it is hoped that there will be learning materials. This is in sync with the (RI, 2002) which contains a teaching material that contains values for the personal formation of students, but if the packaging of the material is not appropriate, it will make students dislike learning.

At the module design stage, there are two stages. The first stage of media selection is done by selecting the application used at this stage using Microsoft Word 2007 software and Corel Draw. The second stage is the selection of the format, the initial design of the module and the initial design of the content design of the integrated learning module of local potential.

The *development* stage is the stage of developing the module in more detail, at this stage the module will go through a validation test by material experts, media, and field tests. Validation on the initial design was first tested on experts according to the related field.

The results of the validity test by material experts on the initial design of the module contained several inputs, namely improvements to the classification of plantae images. The results of the assessment by material experts were obtained by 87% with the appropriate

category for use and the assessment of media experts by 70% with the appropriate category for use.

The next step is *development*, which means field testing, research is carried out with limited scope field tests, and operational tests (wider scope tests). The limited scope field test was carried out to 32 students. The limited scope test uses an assessment questionnaire, which will occur in student responses. The operational test (wider scope) in the class involved 32 students, the module trial was taken using an effectiveness test by comparing the average value of student learning completeness in one semester and the value obtained by students after using the biology learning module.

The results of the effectiveness test according to mastery learning in class X Private Islamic High School NU Siborong-borong by 100% increase students' mastery in learning the material Plantae Karamunting plants. One of the benefits of the learning module is to explain the meaning of the material or subject matter so that it will be easier for students to understand (Ilma & Wijarini, 2017; Teni Nurrita, 2018). The results of the research that have been carried out show that the developed module can be said to be very suitable for use in learning and has succeeded in increasing student learning mastery in line with the function of teaching materials, namely that it can have an impact and influence on students, so that the teaching materials used must be simple and easy to understand (Aydin & Aytekin, 2018; Imtihana & Djukri, 2021; Rosalvin et al., 2022; Slamet et al., 2020).

## CONCLUSION

The validity module learning biology integrated potential of Padang Lawas Karamunting plant (*Rhodomyrtus Tomentosa)* meets the valid category with a material expert validity score of 87% and media expert at 70%. So, it can be concluded that the learning module is categorized as valid and sitable for use in classoom.

The practicality test based on the results of the assessment of the teacher's response to the learning module was categorized as strongly agree to be used in the learning process with a percentage of 92% and student responses with a percentage of 92.11%. Based on the results of the assessment, the learning module was declared feasible and received a good response by the biology teacher

The effectiveness of the local potential integrated biology learning module is categorized as increasing the effectiveness of student learning. Before using the biology learning module, the student's learning completeness score was 78.10% and after using the

biology learning module, the student's score increased to 100%, this is evidenced by the results of the posttest test questions given to students. So that it can be concluded that learning media is effectively used for learning activities.

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## REFERENCES

Anderson, T. R., Schonborn, K. J., Plessis, L., Gupthar, A. S., & Hull, T. L. (2013). Multiple Representations in Biological Education. *Multiple Representations in Biological Education, Series: Models and Modeling in Science Education*, *7*, 55–73. https://doi.org/10.1007/978-94-007-4192-8

Andriana, E., Vitasari, M., Oktarisa, Y., & Novitasari, D. (2017). Pengembangan Multimedia Pembelajaran IPA Berbasis Kearifan Lokal di Sekolah Dasar. *Jurnal Pendidikan Sekolah Dasar*, *3*(2), 186–200. https://doi.org/http://dx.doi.org/10.30870/jpsd.v3i2.2139.g2702

Aydin, A., & Aytekin, C. (2018). Teaching Materials Development and Meeting the Needs of the Subject: A Sample Application. *International Education Studies*, *11*(8), 27. https://doi.org/10.5539/ies.v11n8p27

Budiarti, R. S., & Harlis, D. N. (2020). High Order Thinking Skills for Biology Education: Applied Microbiology Learning Videos Based on Jambi Local Wisdom. *Universal Journal of Educational Research*, *8*(2), 689–694. https://doi.org/10.13189/ujer.2020.080242

Haka, N. B., Anggoro, B. S., Hamid, A., Novitasari, A., Handoko, A., & Puspita, L. (2020). The Development of Biology Module Based on Local Wisdom of West Lampung: Study of Ecosystem Material. *Journal of Physics: Conference Series*, *1467*(1). https://doi.org/10.1088/1742-6596/1467/1/012013

Ilma, S., & Wijarini, F. (2017). Developing of Environmental Education Textbook Based on Local Potencies. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *3*(3), 194–201.

https://doi.org/10.22219/jpbi.v3i3.4540

Imtihana, E. R., & Djukri. (2021). Analysis Learning Resources Based Local Potential of Pacitan Regency as Biology Learning in Senior High School. *Proceedings of the 7th International Conference on Research, Implementation, and Education of Mathematics and Sciences (ICRIEMS 2020)*, *528*, 129–135. https://doi.org/10.2991/assehr.k.210305.020

Njatrijani, R. (2018). Kearifan Lokal dalam Perspektif Budaya Kota Semarang Rinitami. *Gema Keadilan*, *5*(1), 16–31. https://doi.org/https://doi.org/10.14710/gk.5.1.16-31

Nurdyansyah, N. (2018). *Pengembangan Bahan Ajar Modul Ilmu Pengetahuan Alambagi Siswa Kelas IV Sekolah Dasar*.

Putri, A. S., & Aznam, N. (2019). The Effect of The Science Web Module Integrated on Batik's Local Potential Towards Students' Critical Thinking and Problem Solving (Thinking Skill). *Journal of Science Learning*, *2*(3), 92–96. https://doi.org/10.17509/jsl.v2i3.16843

Ramdiah, S., Abidinsyah, A., Royani, M., Husamah, H., & Fauzi, A. (2020). South Kalimantan Local Wisdom-Based Biology Learning Model. *European Journal of Educational Research*, *9*(2), 639–653. https://doi.org/10.12973/eu-jer.9.2.639

RI, D. A. (2002). *Al Quran dan Terjemahnya*. Gema Risalah Press.

Rosalvin, S. R., Anas, N., Studi, P., Biologi, T., Tarbiyah, F., Islam, U., Utara, N. S., Iskandar, J. W., Pasar, V., Estate, M., Serdang, D., & Utara, S. (2022). Development of Biology Module Based on Local Potential of Coffee Plants ( Coffea sp.) *on Inheritance Pattern Materials for Third Class of Senior High School*, *8*(3), 545–557. https://doi.org/https://doi.org/10.36987/jpbn.v8i3.3045

Rumetna, M. S., Lina, T. N., & Santoso, A. B. (2020). Rancang Bangun Aplikasi Koperasi Simpan Pinjam Menggunakan Metode Research and Development. *Simetris: Jurnal Teknik Mesin, Elektro Dan Ilmu Komputer*, *11*(1), 119–128. https://doi.org/10.24176/simet.v11i1.3731

Satriawati. (2019). Efektivitas Penerapan Model Pembelajaran TGT (Teams Games Tournaments) terhadap Prestasi Belajar Biologi Pada Siswa Kelas XII MIA-5 MAN 3 Medan. *Jurnal Biolokus*, *2*(2), 2621-3702201–3702208. https://doi.org/http://dx.doi.org/10.30821/biolokus.v2i2.537

Shufa, N. K. F. (2018). Pembelajaran Berbasis Kearifan Lokal di Sekolah Dasar: Sebuah Kerangka Konseptual. *INOPENDAS: Jurnal Ilmiah Kependidikan*, *1*(1), 48–53. https://doi.org/https://doi.org/10.24176/jino.v1i1.2316

Slamet, A., Andarias, S. H., Ardiyati, D. P. I., B., Y., & Inang, W. D. F. (2020). Potential of Local Plants from Buton Island as a Source of Learning Biology. *Bioedusiana: Jurnal Pendidikan Biologi*, *5*(1), 33–40. https://doi.org/10.34289/bioed.v5i1.1555

Sugiyono. (2020). *Metode Penelitian dan Pengembangan (Research And Devolepment R&D)*. Bandung: Alfabeta.

Teni Nurrita. (2018). Pengembangan Media Pembelajaran untuk Meningkatkan Hasil Belajar Siswa. *Jurnal Misykat*, *03*(01), 171–187. https://doi.org/https://dx.doi.org/10.33511/misykat.v3i1.52

Wulandari, E., & Djukri, D. (2021). Identification of Lampung Local Potential as Source of Biology Learning in Senior High School. *Biosfer: Jurnal Pendidikan Biologi*, *14*(2), 250–263. https://doi.org/10.21009/biosferjpb.20178

Yuliana, Sriyati, S., & Sanjaya, Y. (2017). Local Wisdom of Ngata Toro Community in Utilizing Forest Resources as a Learning Source of Biology. *AIP Conference Proceedings*, *1868*. https://doi.org/10.1063/1.4995217