Development of E-Module Ethnobotany Based on Lombok Local Wisdom to Improve Student Motivation and Learning Outcomes in High School

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Article Info	Abstract
	This study aims to determine the characteristics of the E-module, the validity of the Lombok local wisdom E-module, the readability of students' responses to the E-module, the effectiveness of the E-module in increasing motivation and learning outcomes, and the practicality of the developed E-module. This type of research is the development of research and development (R&D) to see the level of validity of the Lombok local wisdom E-module E-module which was developed by a research procedure by applying 9 steps, preliminary studies, product drafting, design validation, design revisions, limited scale trials, revision of the results of limited trials, large-scale trials, product revisions, practicality and readability tests and finally the final product, this product is an E-module of Lombok's local wisdom ethnobotany. The results of this study indicate that the Lombok local wisdom E-module ethnobotany obtained 76.00% declared valid by expert lecturers with an average value, material expert validation obtained an average value of 76.00% while media expert validation was 92.18%. The results of a large-scale trial of 75 students from each school obtained an average student response of 87.17%, 84.25% and 81.83%. The results of the N-gain value from each school showed that there was an increase in student learning outcomes after using the E-module in the learning process, namely 0.86, at SMA NW Anjani in the high category 0.78, at MA Muallimin NW Anjani school in the high category, the last high of 0.78. at SMA NW Suralaga classified as high category. Furthermore, the results of the practicality test questionnaire filled out by 3 biology teachers obtained average results of 95.00, 98.50 and 97.50 from each school. And this research produces an effective and practical E-module for class X IPA SMA. These results indicate that the product developed is an E-module of Lombok local wisdom ethnobotany as a supplement to plant material to increase motivation and learning outcomes in high school.

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INTRODUCTION

SMA and MA Mu'allimin Nahdlatul Wathan Anjani is one of the formal educational institutions under the auspices of the Syaikh Zainuddin NW Anjani Islamic Boarding School Foundation located in Suralaga, East Lombok Regency. The school continues to improve itself in improving the quality of education, both in terms of the quality and quality of teachers and students. At this time MA Muallimin NW Anjani is a pilot and reference madrasa in East Lombok Regency.

Based on the results of interviews with biology teachers at SMA NW Anjani (personal communication April 2021), information was obtained that the teaching and learning process for biology, especially plant material, was not optimal because it had not utilized local wisdom and the environment around the school. Students tend not to like biology subjects because the material is very broad and has a lot of memorization. Learning outcomes in the plant world material for the 2020/2021 academic year are still low, namely 60 % of the KKM value of 75.

Biology comes from the words bios and logos, bios means life, while logos means study or study. So biology is the study of living things. Living things consist of humans, plants and animals. Apart from the results of observations, the use of learning media in schools has not been maximized (Windiyani et al., 2018) the use of learning media that has not been maximized makes students bored and not interested in learning. The importance of using learning media was stated in the research of Setiyo & Harlin (2018) Many students still have difficulty in understanding the sub-subject of plant diversity in the different parts of plants that are included in the monocotyledonous and dicotyledonous classes.

The availability of examples of pictures from textbooks and student worksheets (LKS) used is still limited, less varied so that it is difficult for students to understand. Visual clarity is very necessary in learning biology, because visual media can increase students' knowledge and understanding. Therefore, it is necessary to have interesting and interactive teaching materials whose materials are obtained from the school environment on the island of Lombok. The untapped potential includes the diversity of plants in the Lemor Lombok Botanical Gardens.

According to Jayanti (2018), the application of local excellence can be used as a source of learning, in an effort to increase students' understanding of local potential related to the social, geographical, regional culture and develop attitudes and behaviors to preserve the resources in the area. So the statement can be concluded that the local potential of the area can be integrated in biology learning and poured in the form of learning media in the form of E-modules so that it can create interesting and interactive learning.

Plantae plant material in Biology subject class X aims to instill new skills and knowledge in students so that they can recognize and be able to distinguish monocotyledonous and dicotyledonous plants by utilizing plants in the lemor lombok botanical garden. To make it happen, teaching materials are needed as additional supplements for students because if you only rely on material in the classroom, it is not enough.

The manufacture of teaching materials as a supplement in the form of E-modules is assumed to be a prerequisite to be implemented for effective data-based decision making at the Lemor Lombok Botanical Gardens in schools so that it affects the effectiveness of using E-modules for the success of the learning process desired by students (van Geel et al., 2017 and Yang, 2020).

The fact that the researchers found in most of the schools in the research area, the use of the school environment has not been utilized as a place for learning outside the classroom. as evidenced by the inability of students to apply plant material in their daily lives, many students are bored in participating in classroom learning without being based on learning outside the classroom because teachers do not care about the environment around the school, (Morgado et al., 2020) .

The results of research by Awwaliyah et al., (2021) show that the use of local potential can be used as a learning resource. E-Module is one of the teaching materials that can be used by teachers to increase learning motivation and student learning outcomes in the implementation of classroom learning. The e-module of teaching materials made

is in the form of an e-module of plant ethnobotany (Asrial et al., 2019; Puspita et al., 2017).

Research results Retnoningsih et al. (2015) Students' learning motivation affects student learning outcomes. Students who have motivation will increase activity and maintain perseverance in learning so that their learning outcomes are getting better.

According to research results (Surahmadi et al. (2016) Motivation is a change in energy in a person (personal) which is characterized by the emergence of feelings and reactions to achieve goals. Learning motivation can arise due to two factors, namely intrinsic factors, in the form of desire and desire to succeed , encouragement and learning needs, and expectations for ideals, while the extrinsic factors are the presence of appreciation,a conducive learning environment, and interesting learning activities.

Both factors are caused by certain stimuli so that someone wants to do more active and more active learning activities. excited. According to research by Wibowo & Pratiwi (2018) suggests that learning media is a factor that can motivate students in carrying out learning and is able to encourage students to achieve maximum learning outcomes.

Based on this background, it is necessary to conduct research on "Development of E-Module Ethnobotany Based on Lombok Local Wisdom as Plant Material Supplement to Improve Motivation and Learning Outcomes in High School". The objectives of this research are 1. Observing the Angiosperms Plant Species in the Botanical Gardens of Lemor Lombok, 2. Making E-modules of ethnobotany from observations to be tested in class.

The benefits of this research are: 1). contribute to knowledge about the richness of the types of flowering plants located in the Lemor Lombok Botanical Gardens area. 2). providing E-modules as alternative teaching materials that are interesting and interactive.

METHODS

This research was conducted in SMA, MA Muallimin NW Anjani, SMA NW Suralaga. This research was carried out in approximately 4 weeks of meetings.

This research begins with the observation of various types of plants in the lemor Suela botanical garden. The results of the observations were made for the E-module material, then tested in three high school classes. Using the Research And Development (R&D) development method, namely the development of the Lombok Local Wisdom E-module ethnobotany.

The source of the initial data for this study was obtained from observations in the Lemor Sueala Botanical Gardens park, these data were recorded as follows. Monocot family: *cannaceae, iridaceae, pontederiaceae, fabaceae. Dicot family: Apocynaceae, malvaceae, commelinaceae, amaranthaceae, astreaceae, nytaginaceae, rosaceae, verbenaceae.* The results of the observations are made E-modules. This E-module learning media is designed by compiling the contents of learning materials in Ms Word and then based on using additional learning programs using the Professional PDF Bulder application so that this application is easy to connect to internet links and can be accessed on the internet. For the purposes of evaluating E-modules in the classroom, various instruments were made for data collection, namely E-module validation assessment data, student learning motivation questionnaires, assessment of learning outcomes, teacher and student response questionnaires.

The previous e-module validation assessment was carried out by this validation by two senior lecturers, material and media experts. The e-module was tested on a limited scale (10 people) of students from each school. The results of the trial were revised according to the input after which it was tested again on a wide scale (25 people) for students from each school.

The purpose of conducting a wider trial is to determine the standard of the product being developed. This stage was carried out by 75 students from a total of three schools namely SMA NW Anjani 25 people, SMA NW Suralaga 25 people, MA Muallimin NW Anjani 25 people in each school.

The trial process was carried out by learning by displaying the E-module using a projector. The

results of the trial were revised according to the input of students and teachers.

The testing phase is carried out with the advance stage at school using a laptop and projector, so that students can see directly from the content of the discussion material and see the steps for identifying flowering plants that have been provided in the E-module. Emodule - tested to students to get input and suggestions from students.

RESULTS AND DISCUSSION

Based on the results of observations in the lemor suela botanical garden, the following is a list of Angiosperm plant species obtained in Table 1.

Table 1. List of Angiosperm Plant Species in the Botanical Gardens of Lemor Suela Lombok.

No	Region Name	Class	Family	Spesies
Monocotyledone				
1.	Flower Monocot	*Liliopsida*	*Cannaceae*	*CannaIndica L*
2.	Catfish Flower	*Liliopsida*	*Iridaceae*	*Trimezia Martinicensis*
3.	Water Hyacinth Flower	*Monocotyledone*	*Pontederiaceae*	*Eichhornia Crassipes*
4.	Peanut FlowerAbut	*Magnoliopsida*	*Fabaceae*	*Arachis Hypogaea L.*
Dicotyledonae				
1.	Hibiscus	*Dicotyledonae*	*Malvaceae*	*Hibiscus Rosa*
2.	Button Flower	*Dicotyledoneae*	*Amaranthaceae*	*Gomphrena Globosa*
3.	Rose Flower	*Dicotyledoneae*	*Rosaceae*	*Rosa Chinensis*
4.	Bebais Flower	*Dicotyledoneae*	*Verbenaceae*	*Lantana Camara*
5.	Tread Dara Flower	*Dicotyledoneae*	*Apocynaceae*	*Catharanthus Roseus*
6.	Flower Jonjot	*Dicotyledoneae*	*Malvaceae*	*Sida Rhombifolia*
7.	Purple Pineapple Flower	*Dicotyledoneae*	*Commelinaceae*	*Tradescantia Spathacea*
8.	Flower JanggarManuk	*Dicotyledoneae*	*Amaranthaceae*	*Celosia Cristata*
9.	Paper flower	*Dicotyledoneae*	*Asteraceae*	*Zinnia Elegans*
10.	Prune Flower	*Dicotyledoneae*	*Nytaginaceae*	*Bougainvillea Spinosa*
11.	Sunflower	*Dicotyledoneae*	*Asteraceae*	*Helianthus Annuus*

Based on Table 1. above, observations were made in the field, which is located in the lemor suela botanical garden park to collect data as well as samples for advanced analysis to be used as sub-subject materials in the development of E-modules that will be developed as learning media. or learning supplements for students in high school, while the data obtained at the lemor botanical garden are as follows in the form of monocotyledonous plants, namely, *cannaceae, iridaceae, pontederiaceae, fabaceae and dicots, namely, malvaceae, amaranthaceae, rosaceae, verbenaceae, apocynaceae, commelinaceae, asteraceas, nytaginaceae* plant species angiosperms obtained by Species in the Botanical Gardens of Lemor Suela, Lombok.

Based on the characteristics of the ethnobotany E-module that was developed, it is able to help students to increase motivation and learning outcomes about flowering plants, students are able to apply it by studying and practicing it on an ongoing basis. In line with research (Syarifah & Astuti, 2020). Motivation is one of the factors in influencing student achievement. The higher the learning motivation of students, the learning outcomes of students will increase by using additional teaching materials in the form of electronic modules.

This e-module can also help students identify and analyze flowering plants and apply their role in everyday life as in achieving KD 3.8 students are also expected to be able to group plants into divisions based on general characteristics and relate their role in life. everyday. KD 4.9 Presenting reports on the results of observations and analysis of phenetic and phylogenetic plants and their roles in everyday life.

A good e-learning module has several characteristics, namely self-instruction, self-contained, stand-alone, adaptive and user friendly. E-Module is a learning module which in its

presentation uses electronic media. So that the characteristics of the E-module are the same as the characteristics of the module, namely self-instruction, self-contained, stand-alone, adaptive and user friendly. Self-instruction is an important characteristic of E-modules and must be contained in E-modules (Wulansari et al., 2018).

According to the research results of Indrastyawati et al., (2016) Learning media in the form of this E-module, can provide benefits for learning on flowering plant material, including making it easier for teachers to present and deliver material, making learning more interesting and varied. Some of the displays on the ethnobotany E-module based on local wisdom of Lombok that were developed are shown in Figure 2.

Figure 2. Display of E-module Ethnobotany Local Wisdom Lombok

The criteria that the researchers have mentioned above indicate that the E-module developed has become an effective media or learning supplement material for students to study independently at home wherever and whenever. These results are in accordance with Winatha (2018). Which states that the interactive E-module is equipped with material explanations, videos, animations and feedback so that it can make students learn and do assignments independently at home.

E-Module Validity According to the Assessment of Material Experts and Media Experts

E-module validity test according to material expert and media expert validation is declared valid Table 3.

Table 3. E-module validation test results

Expert	Aspect Assessment	(%)	Criteria
Material	Feasibility of content	70.83	Valid
	Feasibility of presentation	79.16	Valid
	Language eligibility	75	Valid
	Contextual eligibility	80	Valid
	Average	76.00	Valid
Media	Text message design	91.66	Valid
	Image message design	90	Valid
	message design	91.66	Valid
	Organizing E-module	91.66	Valid
	Average	92.18	Valid

Material experts state that the E-module is very valid because it is in accordance with the learning objectives on plantae or flowering plants, material experts state that the E-module developed has a level of accuracy with KD. The value of the feasibility aspect of presenting this E-module got a good score by material experts such as an assessment of the coherence of concepts, assignments at the end of each learning activity, glossary, bibliography, involvement of students in each learning process. All indicators in the aspect of presentation feasibility get good marks by material experts, so this developed E-module can be tested on students.

According to Marisa et al. (2020) students will easily understand the material and be motivated in participating in the ongoing learning process and if they are able to increase their learning motivation, this ethnobotanical e-module based on Lombok local wisdom is used in the learning process independently.

In line with Susanti & Astuti's research, (2020) teaching materials function as a complement in teaching, and for students, teaching materials serve as additional insight in understanding learning materials. Teaching materials can change the role of the teacher who

was previously a teacher to become a facilitator who plays a role in guiding students to learn independently.

Media experts stated that the Lombok Local Wisdom E-module ethnobotany has a very good and high level of validity so that it is feasible to be applied in the learning process in high school. Media experts considered that the developed E-module has a very good text message design such as the suitability of the color type and spacing and font size. Likewise, the image message design has a very good value because most of the images on the E-module were taken by the researchers themselves, these images have a level of conformity with the plantae material message. So this E-module ethnobotany local wisdom of Lombok can increase interest and increase the learning motivation of students in high school.

Readability of the E-Module

Responses of students are used as a basis to see the level of readability of the E-module of ethnobotany of Lombok's local wisdom which has been declared valid by experts and has been revised, then tested on students. The E-module trial was conducted twice, consisting of a limited-scale trial and a broad-scale trial Table 4.

School	Student	Score (%)	Criteria
SMA NW Anjani	10	84.17	High
MA Muallimin NW Anjani	10	80.00	Low
SMA NW Suralaga	10	81.67	Medium

Limited scale trial students were asked to fill out a participant response questionnaire students who have been prepared by researchers. In the limited-scale trial phase, the average value of each school was obtained, belonging to the High criteria. Based on the value of the student response questionnaire, it can be concluded that students agree to the use of E-modules in the learning process. Starting from the approval of a limited-scale trial of the use of the E-module, the E-module can be tested on a wide scale. Results of student responses in the wide-scale trial Table 5.

Table 5. Student responses in the result results of the analysis

School	Students	Score (%)	Criteria
SMA NW Anjani	25	87.17	High
MA Muallimin NW Anjani	25	84.25	High
SMA NW Suralaga	25	81.83	While

The results of the analysis of student responses to the E-module showed a positive response so that it could be used as a reference in the process of finalizing the product being developed, namely a product in the form of an E-module of Lombok's local wisdom ethnobotany. The atmosphere at the time of conducting this large-scale test was very good and went smoothly.

Based on the research of Sulistyawati et al. (2019) which explains that the development of learning media based on everyday events can provide contextual insight, be able to improve cognitive abilities, and motivate students in learning so as to provide real experiences with the natural surroundings in studying flowering plant material.

In addition to the comments that have been described, that students also comment a lot about their ease in accessing the E-module because this E-module can be accessed using a laptop, android or smartphone so that students can access the E-module wherever and whenever they are. This can make students able to study independently at home.

Based on the results of research by Liana et al (2019) that the development of learning media in the form of interactive Android-based E-modules is feasible to be used as a medium or supplement for effective learning materials so as to increase students' learning motivation.

Effectiveness of E-Modules

According to research conducted by Silvia Oksa and Sunaryo Soenarto (2020) which states that e-modules are feasible and effective to use to increase students' learning motivation. After the trial was carried out, it was found that there was an increase in students' learning motivation after the use of flipbook-based e-modules.

The effectiveness of the E-module in increasing students' learning motivation was carried out in class X MIPA SMA NW Anjani, MA NW Muallimin Anjani and SMA NW Suralaga, the total number of students was 75 students in each school. Testing and measuring the effectiveness of E-modules in improving and improving student learning outcomes is carried out by providing test questions for students. There are 30 multiple choice questions in this test. The items have been tested for validity, reliability, and level of difficulty.

The effectiveness of the E-module is known through the *Pretest* (before the implementation of the E-module) and *posttest* (after the implementation of the E-module). Based on the findings obtained from the results of the pretest

and posttest, students experienced an increase in motivation and learning outcomes after the application of the E-module of ethnobotany of Lombok's local wisdom. The increase in students is the increase in motivation and learning outcomes in the learning process, by looking at the difference in the average value for the pretest and posttest in each school.

The results of pretest and posttest and the value of students' learning motivation can be known by the average score of students' learning motivation, which is known that the increase in the acquisition of students' learning motivation scores on each individual value on each indicator. the average score of students' learning motivation in participating in learning activities consisting of cycle I, the average value is 77.64 in the increasing

criteria with the number of individual learning motivation scores at SMA NW Anjani, the average value is 82.88 in the increasing criteria with the number of individual learning motivation scores of MA Muallimin NW Anjani students and cycle III the average value is 92.90 in the increasing criteria with the number of individual learning motivation values of SMA NW Suralaga it can be concluded that the value of students' learning motivation from cycles I,II,III has increased by following the learning process using the learning media E-module ethnobotany Lombok local wisdom.

The value of learning outcomes obtained from each school can be seen in the Pretest and Posttest which are listed in Figure 6.
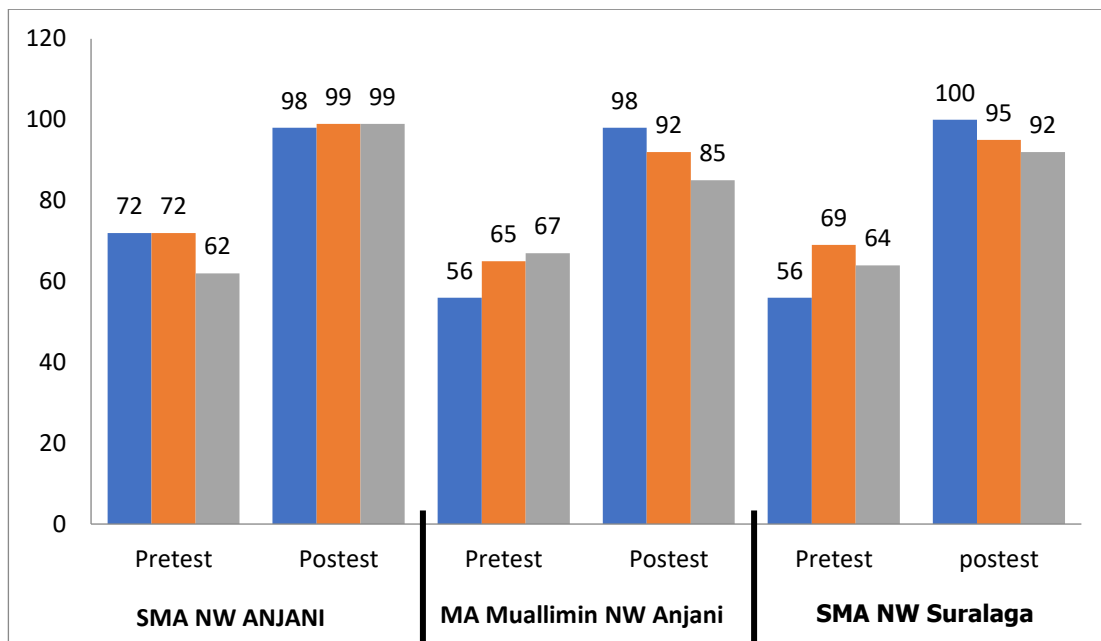

Figure 6. Pretest and Posttest in Each School.

The meaning of each color

| | Low | | Medium | | Hight = *prettest* |
| | Hight | | Medium | | Low = *posttest* |

Based on Figure 6. the data obtained from the Pretest and Posttest values were tested with N-gain. The N-gain test was conducted to determine the level of student learning outcomes. From the

results of the N-gain test for each school, it can be seen in (Table 7)

Table 7. Results of Pretest and Posttest N-Gain Test Results

SMA NW ANJANI	N	Pretest Posttest		-Gain	Category
	72.00	96.44		0.87	High
	72.89	99.54		0.98	High
	62.22	90.22		0.74	High
Average				0.86	Height

MA MUALLIMIN NW ANJANI		N	Pretest Posttest	-Gain	Category
		56.00	93.78	0.86	High
		69.78	94.22	0.81	High
		64.89	88.89	0.68	Low
Average				0.78	Height

SMA NW SURALAGA	N	Pretest Posttest		-Gain	Category
	56.00	98.67		0.97	High
	65.78	92.89		0.79	High
	67.11	85.78		0.57	Low
Average				0.78	Height

In the pretest experiment, the ability of students in class X SMA NW Anjani got a pretest score with an average value of 72.00 with a medium category then carried out on a posttest experiment with an average value of 96.44 with a high category as for the N-gain value the average value was 0, 86 belong to the high category at SMA NW Anjani. then the ability of class X students MA Muallimin NW Anjani got a pretest score with an average value of 56.00 with a low category then carried out on a posttest experiment with an average value of 93.78 with a high category as for the N-gain value the average value of 0.78 belonging to the high category at the MA Muallimin NW Anjani school and the last is the ability of class X students at SMA NW Suralaga to get a pretest score with an average value of 56.00 with a low category then carried out on the posttest experiment with an average value of 98, 67 with a high category as for the N-gain value the average value of 0.78 is classified as a high category at SMA NW Anjani.

So that each aspect value in the analysis calculation uses the N-gain formula. in the aspect of remembering there was an increase with an average value of 0.86 with a high category at SMA NW Anjani school, while in the aspect of remembering it occurred with an average value of 0.78 with a high category at the MA Muallimin

NW Anjani school the last aspect was in the aspect of considering the increase with an average value of 0.86 in the high category at SMA NW Suralaga.

These results indicate that the E-module Ethnobotany local wisdom of Lombok is effectively used by students to increase students' motivation and learning outcomes, namely material about flowering plant plants, indicating that student learning outcomes have increased with high criteria in each school. with the calculation of the analysis on the N-gain formula. Research from Lutfi et al. (2018). Therefore, students are able to understand the material of flowering plants well. This is in accordance with what was conveyed by Sudjana (2010) by using learning media in the form of E-modules as a supporter in understanding student understanding.

CONCLUSION

The characteristics of the developed E-module has the advantage of being an effective learning medium for students. The results of the E-module validity questionnaire according to the assessment of material experts and media experts indicate that the E-module Ethnobotany of Lombok local wisdom is declared valid by material experts and media experts so that the revised E-module can be used in learning and, Readability of

the E-module based on students' responses. -the developed module is feasible to be implemented as a learning media or supplement. It can be concluded that the development of this E-module indicates that students can use the E-module well and are able to understand the contents of the developed E-module.

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