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Development of Biodiversity E-Module in Kelimutu National Park Area to Improv Learning Outcomes of High School Students

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Article Info	Abstract
	The research design is in the form of *Research and Development (R&D)* . This study aims to analyze the biodiversity in the Kelimutu National Park area and develop e-modules that can improve student learning outcomes on biodiversity material. The results of research on biodiversity in conservation areas and villages supporting the Kelimutu National Park are used as a source of material in the developed e-module. A small-scale trial was conducted in class X MIPA 2 SMA Negeri 1 Ende using a one group pretest-posttest design. The validation results show that the e-module is very feasible to use in learning, with the percentage of material validator assessments being 94.4%, media validators 95.3%, and biology teachers 93.2% in the very good category. Student learning outcomes with certain categories (3 students with high abilities, 4 students with moderate abilities and 3 students with low abilities) on the cognitive aspect based on the N-gain calculation of 0.81 in the high category and psychomotor aspect of 83.51 in the good category, and the results of the questionnaire responses of students obtained an average score an average of 91.60 in the very good category. Based on the results of the study, it can be concluded that the biodiversity in the Kelimutu National Park area includes levels of biodiversity (genes, species, and ecosystems), threats, efforts to conserve and utilize biodiversity and the e-module developed is very feasible because it can improve student learning outcomes.

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INTRODUCTION

The Kelimutu National Park area, which is located in Ende Regency, East Nusa Tenggara province, is a well-known tourism destination at the regional, national and international levels. (Gaol, 2014: 32) . Kelimutu National Park (TNK), which is already famous for its three-colored lake, has beautiful natural potential and is located around the Sokoria Forest conservation area which has a diverse flora and fauna ecosystem. (Nugraha & Siti, 2020 : 169) . The potential for biodiversity in the Kelimutu Ende National Park area is a local potential that can be utilized in the world of education. The State High School 1 Ende is one of the public schools located in Ende Regency which the researchers felt was quite contextual for the application of biology learning resources that raised the potential for biodiversity in the Kelimutu National Park area. In fact, in the learning process the teacher has not raised the potential conservation in the Kelimutu Ende National Park area as a learning resource on biodiversity material.

Biology learning material on biodiversity at SMAN 1 Ende during the pandemic was very limited to being able to carry out direct learning activities in nature, even though according to Situmorang (2016: 51) , "biology learning as a part of education has great potential in utilizing the environment as a source of energy. study. One of the benefits of the environment is to examine the local potential that exists in the school environment." Learning during the pandemic requires students to be able to study independently at home even more. However, students themselves are limited in having teaching materials for independent learning at home. Based on the results of interviews with biology teachers in class X MIPA, it shows that student teaching materials for biodiversity material at SMAN 1 Ende are still based on material in biology textbooks in the library and there are no electronic teaching materials given to students as independent teaching materials. during learning during the pandemic. This is evidenced by the results of the questionnaire, it is known that 51.35% of students do not have electronic teaching materials for biodiversity materials. Even though today, the world of education is faced with the era of the industrial revolution 4.0 which requires the world of education to innovate learning, namely integrating learning with technology and information, there are various learning media which are technology, one of which is electronic models or e-modules that can be accessed through various gadgets. such as *smartphones* , tablets and laptops (Karlina et al., 2021: 139) . Students' understanding of biodiversity material only refers to the concepts in the book, so when students are given questions outside of the ones in the book, for example examples from the surrounding environment, students will find it difficult to answer. This causes student learning outcomes to be very low and do not meet the minimum completeness criteria (KKM), as evidenced by the average daily test score for class X MIPA 2 academic year 2020/2021 which is 63.62. The low student learning outcomes are also caused by the lack of students' understanding of the material on biodiversity that is learned from existing biology textbooks. Based on the results of the questionnaire, as many as 64.86% of students had difficulty in studying biodiversity material from library books because it was not interesting, too many writings, poor pictures, videos and audio.

The results of research on biodiversity in the Kelimutu Ende National Park area are local potentials that can be used as sources of biology learning, packaged in the form of e-modules containing interesting material presentations to achieve basic competencies 3.2 analyzing various levels of biodiversity in Indonesia and their threats and conservation and 4.2 presents the results of observations of various levels of biodiversity in Indonesia and proposed conservation efforts. Based on the results of a questionnaire on student needs and interviews with biology teachers, it is shown that teaching materials such as e-modules on biodiversity in the Kelimutu Ende National Park area need to be developed. Therefore, learning resources that promote local potential that are packaged electronically in the form of e-modules really need to be developed as a solution to the use of very limited teaching materials, have not raised local potential as a source of material and have not implemented the use of technology-based teaching materials in learning during the pandemic. , making it less interesting and resulting in low student knowledge of the concept of biodiversity based on examples from the surrounding environment. According to Basaroh et al. (2020: 31) , e-modules are a suitable technology for student learning, where e-modules are combined with interactive animations, pictures and videos that will make students more enthusiastic about learning. Through the development of the biodiversity e-module in the Kelimutu National Park area, it is able to improve student learning outcomes on biodiversity material. Based on the description above, it is necessary to conduct research to analyze the biodiversity in the Kelimutu Ende National Park area as material in the development of biodiversity e-modules in the Kelimutu Ende National Park area which can improve student learning outcomes on biodiversity material.

RESEARCH METHODS

The type of research approach used in this research is *Research and Development* (*R&D*) . The

following is a modification of the steps of the *Research and Development research* which was adapted from Sugiono (2015) includes:
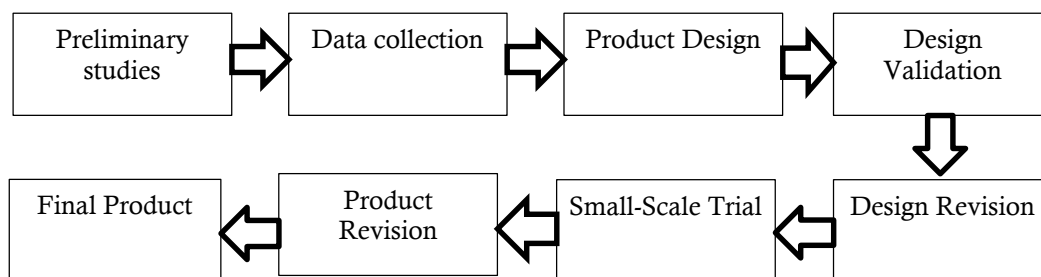

Figure 1. Modification of R&D research steps (Sugiono, 2015)

In May 2021-February 2022, field data collection and small-scale trials will be carried out. Stages The data collection in this study was divided into two stages, namely data collection for materials for making e-modules at the Kelimutu National Park office and the Kelimutu National Park area which includes conservation areas (use zones and core zones) and buffer villages (residential areas and community plantations). Woloara Barat which is located in Kelimutu District, Ende Regency, East Nusa Tenggara Province) with data collection methods including exploratory studies, observations and interviews and data collection when e-modules are used in learning in class X MIPA SMAN 1 Ende by using questionnaire sheets, interview sheets and multiple choice question sheets. The preparation of the e-module and expert validation (materials and media) were carried out at the State University of Semarang, the e-module was also validated by a biology teacher at SMAN 1 Ende. Validation by experts and biology teachers uses a questionnaire as a validation instrument, the validation results are then revised according to the suggestions and inputs given by the experts. After the e-module is said to be valid, the e-module is tested on a small scale. The subjects of the small-scale trial were students of class X MIPA 2, as many as 10 students with categories (3 high-ability students, 3 moderately capable students and 3 low-ability students) measured the increase in learning outcomes in the cognitive aspect based on the *N-gain value* using multiple choice question sheets. with *a one group pretest-posttest design* and psychomotor aspects using the results of the product assessment sheet, as well as filling out student responses questionnaires carried out by 35 students of class X MIPA 2. The data analysis used in this study was the *mix method* (qualitative and quantitative).

RESULTS AND DISCUSSION
Biodiversity in the Kelimutu National Park Area
The results of the analysis of the diversity of flora and fauna species in the Kelimutu National Park area based on statistical data from the Kelimutu National Park office in 2019, it is known that there are 140 species of woody plants (trees and shrubs) consisting of 50 families, 36 species of herbaceous plants consisting of 18 families. 57 species of birds (aves) consisting of 35 families, 13 species of mammals and 4 species of reptiles, of which it is known that there are 4 species of endemic flora, namely *Begonia kelimutuensis, Rhododendron renschianum, Alstonia scholaris, Timonius timon* and 11 species of endemic fauna, namely *Nisaetus floris, Ducula rosacea, Ficedula dumetoria, Caridonax fulgidus, Heleia crassirostris, Lophozosterops dohertyi, Pachycephala nudigula, Phylloscopus presbytes, Otomops johnstonei, Papagomys armandvillei, and Rattus hainaldi.* The endemic flora of kelimutu found during the exploration study is *Begonia kelimutuensis* and *Rhododendron renschianum* , these two species are characteristic of this region. *Begonia kelimutensis* is endemic in Kelimutu National Park, Flores at an altitude of 1,527 asl, at a soil pH of 5.8 and a soil moisture of 75%, with a slope of 10° on the forest floor and a light intensity of 4,640 klux, *Begonia kelimutuensis* was also found live together with several other plant species such as the pioneer tree species *Macaranga* sp. and also *Litsea* sp. (Sutomo & Iryadi, 2021:5) . " This *Rhododendron renschianum* is a typical and endemic plant species of Kelimutu National Park that can be found in the core zone area." (Harry and Wawo, 2008: 188) There is something unique about the turuwara vegetation (*Rhododendron renschianum)* found by researchers when conducting observations around the arboretum/mini forest area, researchers found a dwarf tree that usually grows around the crater lake area of 3 colors with a layer of rocky sand and high sulfur steam , grows attached to the trunk of a pony tree (*Cyathea sp*) whose trunk surface is overgrown with moss, it is estimated that while its spread is carried by wind or birds. This is still a further study from the Kelimutu National Park office. The endemic fauna of Kelimutu found was *Pachycephala nudigula* . Pachycephala *nudigula* is a bird species distribution from Nusa Tenggara which is included in the IUCN list of low risk status . (Langkamau, Purnama, and Kaho 2019) . Garugiwa or commonly referred to by local people as spirit birds, this is because these birds are often difficult to find, the only sound that

can be heard is their chirping. This spirit bird has a characteristic in the form of 12-17 different chirping sounds, the chirping is heard from sunrise to 10.00 am.

Based on the results of exploratory studies, the diversity of gene levels found includes the diversity of gene levels in flora, namely variations in the surface of the mountain pine tree trunks (*Casuarina junghuhniana*) *,* color variations tembelekan flower (*Lantana camara*), sulfur kenikir flower color variation (*Cosmos sulphureus*), paper flower color variation (*Zinnia elegans*), hibiscus flower color variation (*Hibiscus rosa-sinensis*), water girlfriend flower color variation (*Impatiens balsamina),* color variation and the shape of the apple (*Malus sp), the* color variation of the pineapple (*Ananas comosus*), variations in color of potato flowers (*Solanum tuberosum*) and diversity of gene levels in fauna, namely variations in dog hair color (*Canis lupus familiaris*) and variations in feather color of native chickens (*Gallus gallus domesticus*). Variations in color, shape and taste are certainly strongly influenced by genetic factors. According to Suryanto (2003) , "in high diversity there are genes that have high potential as well." The diversity of species level in the Kelimutu National Park area found by i in this study include an example of the level of species diversity in flora and fauna whose data was taken directly in the conservation area and the supporting village of the Kelimutu National Park, while data on the diversity of tree species, herbaceous plants, birds, mammals and reptiles in this study used secondary data. The species level diversity found included species level diversity in flora, namely species variations in the Ericaceae family, namely the *Vaccinium varingiaefolium* (Arngoni) and *Rhedodendron renschianum* (Turuwara) species, species variations in the Moraceae family, namely the *Ficus variegate* (Kelo) species, *Ficus sp* (Pela)), *Ficus fistulosa* (Bongo), and *Ficus hirta* (Wudu), species variations in the Lauraceae family, namely *Litsea sp* (Uru lema), *Actinodaphne sp* (Mera mite), and *Cinnamomum verum* (Kaju sweet) species, species variations in the Ulmaceae family namely the species *Celtis tetranda* (Seti) and *Trema orientalis* (Deo), species variations in the family Euphorbiaceae, namely the species *Omalanthus giganteus* (Kebu) and *Omalanthus populneus* (Karembi/kebu loo), species variations in the asteraceae family, namely the species *Vernonia arborea* (Jawe), *Euphatorium odoratum* (Krinyu) and *Anaphalis longifolia* (edeleweis), species variations in the zinger family, namely *Zingiber officinale* (Ginger) and *Curcuma longa* (Turmeric), species variations in calliandra plants, namely *Calliandra calothyrsus* (red Kaliandra) and *Calliandra tetragona* (white Kaliandra), species variations in coffee plants namely in arabica coffee (*Coffea arabica*), variations in types of palm trees, namely on coconut trees (*Cocos nucifera*), sugar palm trees (*Arenga pinnata*), areca nut trees (*Areca catecu*) and diversity of species levels in fauna, namely variations in species in the family. bovidae namely in cattle (*Bos taurus*) and goats (*Capra aegagrus hircus*). The diversity of ecosystem levels found in the Kelimutu National Park area includes 4 types of ecosystems, namely crater lake ecosystems, forest ecosystems, mountain ecosystems and plantation ecosystems.

Based on interview data, it is known that the threat of biodiversity conservation in the Kelimutu National Park area comes from within and from outside the area. Threats originating from within the area are parasites that grow on *Vaccinium varingiaefolium (Arngoni)* , *Gleichenia linearis* (Paku kepa/Paku resa) and *Euphatorium odoratum* (Krinyu/Census) as IAS (*Invasive Alien Species*) that grow to dominate other native species, while threats from outside, such as small-scale illegal grazing and grazing, small-scale hunting using snares and air rifles, and small-scale forest fires. The village of Woloara Barat, which is near the boundary of the Kelimutu National Park Area, has experienced several small- scale forest fires around the boundary during the dry season , in addition, local people often carry out land burning activities to open new land and there is often illegal hunting of protected animals in the area. Kelimutu National Park is by trapping animals that enter the community's agriculture or plantations . Efforts were made to overcome threats from within the area, namely by mobilizing forest rangers and work staff in the Kelimutu resort area to cut down parts of trees that already had parasites, this was done to stop the spread of parasitic growth on the trunks of arngoni and turuwara trees. In addition, pruning *Gleichenia linearis* (Paku kepa/Paku resa) and *Euphatorium odoratum* (Krinyu/Sensus) as IAS (*Invasive Alien Species*) by physical means (pulling up to the roots) and chemically using chemicals, in addition also carried out the multiplication of the merameke ria tree species (*Pittosporum moluccanum*) which serves to suppress the growth rate of krinyu. Conservation efforts carried out by the National Park Office to overcome external threats are making binding rules regarding the utilization and management of biodiversity in the Kelimutu National Park area and making persuasive efforts with village heads and traditional leaders to the local community to cooperate in conserving biodiversity in the area. the Kelimutu National Park area, carry out a flora conservation program, namely by increasing the number of populations, for example increasing the species *V accinium varingiaefolium* and *Rhododendron renschianum* , cultivating local plants with high selling value, for example local edelweiss kelimutu through edelweiss cultivation outside the conservation area, conducting fauna conservation activities one of them is by identifying bird species and monitoring Flores eagles (nest adoption), which is then made a bird manual to help identify bird species in the Kelimutu National Park area. In addition, increasing the number of tree seedlings whether it is used for firewood,

wood for buildings or traditional wood, where some are planted in the Kelimutu National Park conservation area and some are distributed to the community to be planted in the Kelimutu National Park. community land . In addition to the conservation efforts carried out by the Kelimutu National Park office to prevent and overcome the above problems, of course, it also requires an active role from the local community, namely by actively collaborating with reforestation or reforestation activities with the Kelimutu National Park office along the boundaries and community lands, actively implementing programs cleanliness (waste activists), the community participates in maintaining boundaries, preserving nature, preventing land fires around the boundaries and national park areas, the community contributes as a community in partnership with the national park forest police, and performs the Pati Ka Du'a Bapu Ata Mata traditional ceremony as a form of collaboration between nature, culture and humans in preserving all aspects of life on Earth Kelimutu.

Based on the results of exploratory studies and interviews, several examples of the use of biodiversity in the Kelimutu National Park area are known, namely for tourism, education and research, cultural and economic activities. The tourism aspect presented is the natural tourism of the Kelimutu 3-colored lake, the biodiversity and ecosystem around the Kelimutu National Park area which is used as a tourist attraction that spoils the eyes. "Kelimutu National Park has natural potential that can be utilized to support learning activities." (Ule et al., 2021: 148) Areas that are often used for education and research aspects in the Kelimutu National Park area are the Kelimutu National Park education route, mini forest/arboretum, herbarium and insectarium. On the cultural aspect, biodiversity and ecosystems in the Kelimutu National Park area are utilized for the traditional ceremony of Pati ka Du'a Bapu Ata Mata. In the economic aspect of biodiversity, which is not included in the protected species, is cultivated and managed by the Kelimutu National Park office outside the conservation area, such as edelweiss and local strawberry plantations in Kelimutu which can be traded to the general public which is very profitable from an economic point of view, and also on the other hand. can be used as one of the artificial tourist sites that support the main tourism of Kelimutu National Park.

In general, the utilization of biodiversity in the supporting village communities of West Woloara is used to meet their daily needs, be it clothing, food and shelter, while also being traded to the wider community. Examples of liver used by the people of West Woloara for food needs are *Melastoma malabathricum* (Mboa ria), *Calliandra tetragona* (Kaliandra), *Sorghum bicolor* (Lolo), *Solanum tuberosum* (Potato), *Coffea arabica* (Coffee), *Psidium guajava* (Guava), *Musa sp.* (bananas), and *Gallus gallus domesticus* (village chicken). The liver used for board needs is *Eucaliptus geruguta* (Ampupu). In addition, the Woloara village community uses several types of plants as traditional medicinal plants. The plants used as traditional medicine are *Borreria laevis* (Mbunge/Amethyst), *Asclepias curassavica* (Kembang mas), *Centella asiatica* (Tete ka'ado / Gotu kola), *Canna tuerckheimii* (Canna), *Calliandra calothrysus* (Red Kaliandra), *Zingiber officinale (* Ginger *)*, *Arenga pinnata* (Moke /a ren), and *Carica papaya* (Papaya a). The results of research related to biodiversity in conservation areas and supporting villages of Kelimutu National Park are then made into a product of teaching materials in the form of an e-module on Biodiversity in the Kelimutu National Park area , this e-module is equipped with photos of research results .

Development of Biodiversity E-Modules in the Kelimutu National Park Area that Can Improve Student Learning Outcomes

The development of the e-module for biodiversity materials was carried out based on several potentials and problems found during the preliminary study at the beginning of this research, namely related to the problem of using teaching materials during the pandemic. Based on the results of teacher interviews, observations and student needs questionnaires, it can be concluded that teaching materials for students and teachers at SMAN 1 Ende are still limited because they only use biology textbooks from the library, teaching materials have not raised local potential studies as learning resources and have not implemented teaching materials. electronic learning in learning during the pandemic, especially on biodiversity material. In accordance with the results of Prasetyo's research (2020:135) which states that, "electronic modules are seen as one of the right solutions to support distance learning because of the nature of electronic modules that students can make independent learning."

The potential for biodiversity in the Kelimutu National Park area is a local potential that can be used as a source of material for biodiversity. This is because local potential is the state of the environment around students, where students will learn from examples that exist in the environment around students. According to Situmorang (2016: 53) , the location of schools that are close to various local potentials can take advantage of the surrounding environment with different packaging, because the surrounding environment holds various potentials as sources and media for learning biology for students, which can be optimized through the development of teaching materials to enrich the material. and make the learning process more interesting and varied. Through the presentation of material that raises the study of biodiversity in the Kelimutu National Park area, it will increase students' interest in studying biodiversity

material. In addition, through the presentation of materials that raise local potential, of course, it will further increase the sense of love and pride in local culture. According to Nurmalasari et al. (2019: 57) , integrating local potential into biology learning makes students more respectful of local potential and culture, so basically students need to be given direct (contextual) experience in local potential-based biology learning, especially on biodiversity material.

The process of compiling the e-module begins with selecting the source material based on the results of analysis and documentation of biodiversity research in the Kelimutu National Park area from independent research results supported by some secondary data in the form of statistical data from the Kelimutu National Park office as well as from several books and journals related to biodiversity. in the Kelimutu National Park area. The preparation of the e-module took place in September. The design of the e-module in this study was adjusted to the criteria for assessing the validity and feasibility of the module. The e-module in this study is presented in the form of *software* that can be accessed online, in the hope that it can be an alternative to flexible learning both in class and independent learning from home during learning activities during the current pandemic. The components in the developed module contain a module cover , title page, foreword , table of contents , list of pictures, list of tables, chapter pages (basic competencies and learning objectives) , concept maps , summary introduction of the National Park area. Kelimutu Ende , biodiversity in the Kelimutu National Park area, activity 1, increasing biodiversity in the Kelimutu National Park area, activity 2, threats and efforts to conserve biodiversity in the Kelimutu National Park area, activity 3, utilization of biodiversity in the Kelimutu National Park area, activity 4, summary , competency test, glossary , bibliography , answer key and scoring guidelines , author's bio , and closing cover . The e-module design in this study uses the Canva application to create module layouts, Microsoft Word to arrange components in the module, and the *Fliphtml5 application* to create e-modules, which in the end this e-module can be accessed online from *android* , laptop or computer. which is adapted to the *software output format* . After the e-module has been compiled, the e-module then goes through a refinement process with the help of revisions from supervisors, media experts, material experts and teachers.

E-module on Biodiversity in the Kelimutu National Park Area has been validated by material experts, media experts, and biology teachers. Material and media experts give an assessment on the feasibility component based on the expertise possessed , but for the assessment of all feasibility components carried out by biology teachers because those who will use e-modules directly in learning both in class and online are teachers . In addition to using a validation questionnaire from experts and biology teachers, the data on the feasibility of the e-module was also measured from the assessment of improving student learning outcomes in cognitive and psychomotor aspects and also based on the results of the student response questionnaire . The results of the validation of the e-module material by material experts show that overall obtained 96.88% in the aspect of content validity, 95% on the language validity aspect and 90% on the presentation validity aspect , the average of the validation results by material experts is 94, 4% with very good category. The results of the validation of the e-module media by media experts showed that overall it was obtained 90.62% in the aspect of the display of teaching materials and 100% in the aspect of use with an average of 95.31%, with a very good category. There were several suggestions and input from material and media experts which were then revised to improve the e-module. In addition, based on the results of validation by 2 biology teachers, the percentage with an average of 93.24% was obtained in the very good category and did not need to be revised.

Small-scale trials were carried out after media experts, material experts, and biology teachers stated that the e-module was suitable for use after going through the assessment stage . e-module. Cognitive test useful in small-scale trials to determine the feasibility of e-modules in improving student learning outcomes which are seen based on completeness above the KKM 75 and the value *of N-gain* . Analysis of learning outcomes 10 students of class X MIPA 2 SMAN 1 Ende with different ability categories obtained a score above the KKM 75, so that the percentage of completeness obtained was 100%. In this study, the average *posttest score* 78.73 and *pretest* 40.10, the average value of learning outcomes based on *the N-gain* of 10 students in certain categories is 0.81 in the high category, with details of the *N-gain value* for high-ability students the average is 0.83, students the average ability is 0.81 and the average low-ability student is 0.80. The *posttest score* reached 75% of the total number of students who scored above the KKM 75, so that the classical completeness obtained was 100%. (Table 1)

Table 1 . Learning Outcomes for Class X MIPA 2 Students based on *N-gain*

No	Respondent	Amount	*N-gain*	Category	Criteria
1	High ability students	3	0.83	*N-gain* 0.7	Tall
2	Medium ability students	4	0.81	*N-gain* 0.7	Tall
3	Low ability students	3	0.80	*N-gain* 0.7	Tall
	Average *N-gain*		0.81	*N-gain* 0.7	Tall

In small-scale trials students give an assessment of the e-module using a student response questionnaire. The results of the percentage of 12 aspects of the statement in the questionnaire obtained the lowest percentage, namely 85 % , while the highest was 97.14 % and the average was 91.60 % with very good criteria. The results of the student response questionnaire obtained the lowest percentage of 83.33 % with good criteria and the highest percentage of 97.91% with very good criteria. In addition to cognitive tests, students were given an assignment to compile an e-poster related to the invitation to conserve biodiversity in the Kelimutu National Park area in online class learning activities for the implementation of e-module products on a small scale. Assessment of the e-poster product to measure student learning outcomes in psychomotor aspects. The results of the assessment showed that all students with high, medium and low ability categories scored above 75 with details of the highest score of 91.6 and the lowest being 79.1, so the average score was 83.51 in the good category. The recapitulation of the results of the e-poster product assessment can be seen in Table 2.

Table 2. Recapitulation of E-Poster Product Assessment Results

No	Category	Amount	Average value	Information
1	High ability students	3	88.8	Well
2	Medium ability students	4	85.4	Well
3	Low ability students	3	75.7	Currently

Highest value : 91.6

Lowest value : 79.1

Average grade: 83.51 (Good)

CONCLUSION

Based on the results of the study, it can be concluded that the results of research on biodiversity in the Kelimutu National Park area (conservation and buffer villages) include levels of biodiversity (genes, species, and ecosystems), threats, conservation efforts and utilization of biodiversity. The results of the research on gene diversity found various genetic variations in mountain cypress trees (*Casuarina junghuhniana*), tembelekan plants (*Lantana camara*), sulfur kenikir flowers (*Cosmos sulphureus*), paper flowers (*Zinnia elegans*), hibiscus flowers (*Hibiscus rosa-sinensis*), flower water henna (*Impatiens balsamina*), dog (*Canis lupus familiaris*), apple (*Malus sylvestris*), pineapple (*Ananas comosus*), potato flower (*Solanum tuberosum*) and free-range chicken (*Gallus gallus domesticus).* The species-level diversity found in the conservation area was variations in tree species in 6 families and in the buffer village area found species variations in the zinger family, calliandra plants, coffee plants, palms, bovidae families and found 4 kinds of ecosystem level diversity. There are threats that come from within and from outside that threaten the biodiversity in the Kelimutu National Park area, to avoid these threats, various conservation efforts have been carried out from both the Kelimutu National Park office and the indigenous peoples in the supporting villages of the Kelimutu National Park area. Biodiversity in the Kelimutu National Park area is utilized in the aspects of tourism, education and research, culture, and economy. The people of West Woloara Village as one of the supporting villages for the Kelimutu National Park utilize the existing biodiversity on community land for clothing, food, and board needs and is used as herbal medicine. The results of this study are used as a source of material in the developed e-module. The e-module "Biodiversity in the Kelimutu National Park Area" that has been developed can improve student learning outcomes on biodiversity material. This is evidenced from the learning outcomes of students with certain categories (3 high-ability students, 4 moderately capable students and 3 low-ability students) in the cognitive aspect based on the *N-gain value* of 0.81 in the high category and in the psychomotor aspect of 83.51 in the good category. The e-module obtained valid criteria and was very suitable for use in learning with a percentage of material validator assessment of 94.4%, media validator 95.3%, and biology teacher 93.2% in the very good category, as well as the average score of the response questionnaire results. 91.60 students in the very good category.

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