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Analysis of Needs for Biology E-Module Based on Local Wisdom North Maluku, Indonesia

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Keywords

Needs analysis, Biology E-Module, North Maluku local wisdom.

ABSTRACT

The content of learning material is packed with the local wisdom of an area which is taught using examples related to local wisdom, so students will easily understand the knowledge being taught and can relate the knowledge obtained to real situations that are close to students' daily lives. This study aims to analyze students' needs for interactive digital modules based on North Maluku local wisdom. This type of research is development research (R&D) using the ADDIE model. The data obtained used interviews with biology teachers and also used questionnaires via Google form to 88 students spread across several high schools in Ternate City, North Maluku, Indonesia. As for the student needs analysis questionnaire consisting of seven indicators, all research data obtained was analyzed descriptively qualitatively. The results showed that: 1) The content of biology material taught in high school has not been integrated with local wisdom, 2) the learning resources used are textbooks, worksheets, e-books, videos, and internet media, 3) as many as 64.2 % of students said they had never used e-modules, 73.5% of students did not understand local wisdom in North Maluku, and as many as 75.1% of students stated that there was a need for interactive modules to support biology learning, thus it can be concluded that e-modules need to be developed biology based on the local wisdom of Ternate, North Maluku as a supporting learning resource in learning biology in high school.

INTRODUCTION

Teachers are required to be able to design teaching materials and interactive learning media so that they are fun and attract students' interest when learning takes place. Interesting design of teaching materials and media will increase students' interest in learning. Modules are printed teaching materials which are printed books that are often used by teachers during learning in addition to teacher books, but with the development of technology and science, modules have begun to transform into an accessible digital format that teachers and students can access from laptops, computers and smartphones. The created e-module contains concepts, images, audio, and video. The advantages of the E-Module include that it does not require physical module repair costs, can be accessed anywhere and anytime, and can be used by students to study independently (Mok, Ka Man, 2023). Digital-based modules are an alternative teaching material designed to increase students' interest and understanding of independent learning (Al-Yateem, Nabeel, 2023). Teaching

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materials in the form of e-modules can make it easier for students to study independently and measure the level of mastery of the material through questions in the form of quizzes available in the e-module (Saryadi, W., & Sulisworo, D. , 2023). rRevealed that the advantage of the module compared to other teaching materials is that students can access it easily and can use it independently (Agprianti, Nurul, 2022).

Daryanto (2013) explains that the module has 5 characteristics, namely 1) elfinstructional (allows students to learn independently), 2) Self-contained (the module contains learning material as needed), and 3) Standalone, that is, it can stand alone, 4) Adaptive (modules must keep up with developments in science and technology), and 5) User friendly (modules are flexible and easy to use and understood by students both in the language used, the appearance of the module and the content delivered. According to Kumala & Sulistyowati (2016), that teacher activity in the implementation of learning that has occurred so far has only used textbooks that are already available without integrating local wisdom, if the context of the material is combined with local wisdom, the learning that occurs becomes more meaningful.

One way that can be done in introducing local wisdom to students is by integrating it into e-modules as attractive tools and facilities that facilitate students' attention while studying. The existence of e-modules based on local wisdom is closely related to learning biology which is a subject that is closely related to the environment (Latri, 2022). Hadi & Dazrullisa (2018) revealed that teaching materials are said to be good if they are developed and designed according to the characteristics according to the needs of students by looking at geographical, ethnographic, and regional wealth factors. Muhammad et al, (2020) & Dewinta et al (2021) explain that a teaching material is said to be ideal if it meets several criteria, one of which contains local wisdom which aims to invite students to understand biology material through activities and experiments. A very important and essential part of strengthening the biology content that is learned if the material is integrated with local wisdom (Parmin, 2015). In line with this statement, according to Ramli (2013) that it is necessary to include examples of local wisdom in learning biology so that learning becomes meaningful and very close to students' daily lives in everyday life.

The study of North Maluku local wisdom into subjects should have been included in the education curriculum taught in schools in Ternate City, North Maluku Province, this statement is in line with the results of Karyadi's research (2016) which revealed that developing natural science learning resources by integrating local potential can become the choice of educators or teachers to increase students' love and concern for the surrounding environment. Muktadir & Agustrianto (2014) conducted research and studied Bengkulu local wisdom regarding teaching materials based on local wisdom to improve the character of elementary school students. Lazuardi & Nugroho (2019) also conducted similar research on developing a drama appreciation module based on local wisdom. Furthermore, Nata (2021) in his research has developed a science module based on the local wisdom of Ulu Musi, South Sumatra, for junior high schools. The results of this literature review explain that interactive modules based on the local wisdom of North Maluku Ternate in Biology class X SMA using interactive digital technology, so far no one has developed it and this is the latest point in this research.

METHODS

The type of research used is Research and Development (Reasearch and Development). The stages of developing the model used in this research are the ADDIE development research model developed by Dick and Carry (1996) with the development steps consisting of 5 stages namely; Analysis (analysis), Design (design), Development or Production (development), Implementation (implementation) and Evaluation (Evaluation). This research developed an interactive product module based on the local wisdom of North Maluku (Branch, 2009).

This research was conducted in several high schools in Ternate City, Indonesia. The sampling technique used purposive sampling technique (Cohen et al., 2007). Research data was collected through interviews with four Biology teachers at several high schools in Ternate City. Data collection was carried out through interviews with four Biology teachers from several high schools in Ternate City. In addition, 88 students will fill out research questionnaires via Google forms spread across 4 schools (SMA) in Ternate City.

The instruments used were structured interview sheets and questionnaires. Interview sheets were used to collect qualitative data that would describe biology learning related to the curriculum used integrated with local wisdom in the use of learning resources. In addition, a questionnaire sheet was used to collect quantitative data consisting of six aspects. The indicators of the six aspects used as benchmarks are: 1) the learning system used, 2) students' knowledge of interactive modules, 3) students' knowledge of local wisdom in North Maluku, and 4) biology learning resources used by students, (5) responses students towards interactive modules; (6) students' need for interactive modules based on North Maluku local wisdom. Furthermore, the data obtained from the interview results were analyzed qualitatively with the help of SPSS.

RESULTS AND DISCUSSION

The initial step in this research is to analyze learning outcomes and core competencies in biology subjects. The researcher found that in general every material in biology learning was still being developed in accordance with learning achievement standards which were not expressly written in the Basic Competencies and Core Competencies. This is supported by the results of interviews with subject teachers who revealed that so far Biology learning has only focused on achieving learning objectives that have been made in learning tools, and has not linked them to the uniqueness of an area and integrated them into learning.

In addition, this study also found that teachers were very interested in innovating by utilizing technology in learning, even though there were still various obstacles related to the implementation time of learning. The teacher admits that there is still subject matter that has not been explicitly taught in class, namely environmental pollution material, because the material is considered to be learned by students independently by observing the surrounding environment without guidance from the teacher. Thus, teachers recognize that the development of Ternate local wisdom-based biology subject modules developed by utilizing technology can be an alternative to biology learning so that students can learn independently without having to direct guidance from the teacher in class. The advantages of the developed learning module can facilitate students to be able to discuss collaboratively which can increase student motivation and interest in learning. This module can also be integrated with learning management systems to make it easier for teachers, especially when implementing online learning. Kun (2013) states that it is undeniable that currently teachers are still being cared for by verbal orators, including in science learning. This is based on the phenomenon that there are still many teachers who need to be active as verbal orators, and there needs to be efforts to increase teacher motivation to be more creative and able to create a conducive atmosphere for their learning environment.

Researchers also reviewed several learning resources available in schools with the following results: 1) the most widely used learning resources were books and student worksheets in printed form, whatever interactive learning media were not yet available in every school; 2) the learning resources used are not related to Ternate local wisdom. So far, learning has taken place from the environment, but the teaching materials used need to be linked to local wisdom. The results of the questionnaire analysis given to students from several high schools in Ternate City for each indicator are shown as follows:

Figure 1. Student responses to student-centered learning systems

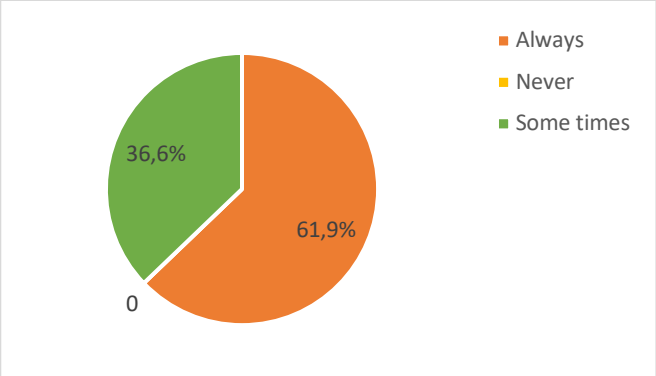


Figure 1 shows that 61.9% of students state that the learning system is always student-centered. In comparison, 36.6% of students revealed that learning biology at school always involves students to actively participate. Based on these data, learning biology in several high schools in Ternate City has implemented student-centered learning. This is because high school learning in the city of Ternate has implemented the 2013 curriculum where the curriculum enables a student-centered learning process. The 2013 curriculum emphasizes all competencies namely attitudes, skills and knowledge, which are student-centered through a scientific approach (Diana, 2023). The implementation of the curriculum has directed students not to always depend on information from the teacher but students independently solve the problems they learn, can propose hypotheses, collect data, analyze data and make conclusions. The implementation of the 2013 curriculum requires student-centered learning, therefore, the learning process is expected to use a scientific approach. A scientific approach can facilitate students in strengthening attitudes, skills and knowledge to produce productive, effective, innovative and creative students (Daga, A. T. , 2022). Through a scientific approach, the learning process becomes more optimal and effective compared to traditional learning. Regarding curriculum changes, the implementation of the 2013 curriculum is different from the previous curriculum, where the implementation of student learning is more active and enthusiastic in learning. Students are required to be more critical and independent in order to foster the values of attitudes, curiosity, and confidence in each learning process (Makaborang, 2019), (Fahmi, 2020). Research data on curriculum implementation, that in general teachers have readiness in implementing the 2013 curriculum in Indonesia, data from the results of the analysis show medium and high categories, so they are able to support curriculum implementation (Nurhasanah, 2021). Although certain aspects are known to be low, such as compiling assessments and mastery of teaching materials.

Figure 2. Learning resources used in biology lessons

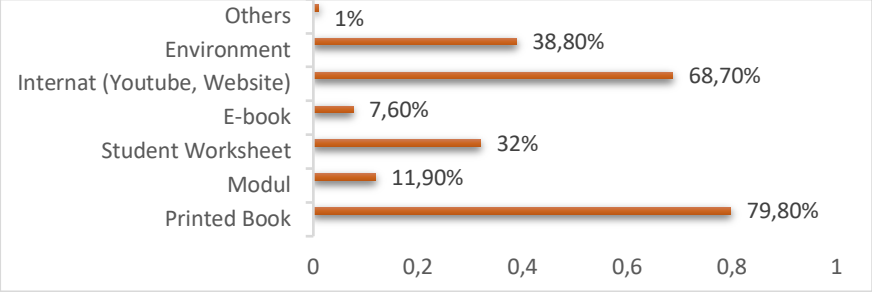


Figure 2 shows that the most widely used learning resources are textbooks or printed books, as much as 79.8%. Other learning resources that are widely used by students are the internet (youtube, website), 69.7%, environment 38.8%, student worksheets 32%, modules 11.9%, and E-Books 7.6%.

The data illustrates that learning resources through modules and e-books are learning resources that are rarely used by students when studying biology material. This is because there are not yet available learning resources in the form of modules in schools. Zanjabila, & Rahmawati, 2022 explained that only the majority of students use printed books as a learning resource, and teaching materials in the form of biology learning modules are not yet available in schools because teachers still think that printed books in circulation represent all learning material (Zanjabila, 2022). Another reason for the unavailability of modules and e-books is due to limited funds and time in developing them. Research conducted by Sutrisna & Gusnidar (2022) explains that biology learning only refers to printed books.

It is undeniable that many students use other learning resources such as YouTube by accessing the internet. The data shows that learning resources from the internet are the second largest source of student learning. This is because technological advances that provide various learning resources make it easier for students to access all information anywhere and anytime. Jamroh, Wardoyo & Julaeha, (2021) revealed that YouTube is a digital platform that is quite popular as a learning resource. States that the media has an important role in learning, the right learning media will be able to increase student learning motivation (Anisa, Y. ., 2022). One of the media that

is widely used today is YouTube which provides audio-visual media for learning . Arham (2020) One of the most popular social media networks today is Youtube. Youtube is allegedly able to increase student interest and motivation in learning. Timambunan (2022) has revealed that an alternative learning resource that is widely used is YouTube because it can be a source of information and entertainment for students, so that it becomes more attractive to students.

The graph above shows that in learning biology at school, students are also used to using student worksheets and the environment as a supporting learning resource. This is in line with efforts to implement the 2013 curriculum which emphasizes science with a biology learning approach by familiarizing students with using the environment as a learning resource. Putra (2021) reveals that the scientific approach directs students to construct their knowledge through observing, formulating problems, proposing hypotheses, collecting data, analyzing, and drawing conclusions. Dini (2021) states that scientific learning directs students to be able to produce products so that ongoing learning becomes more meaningful. Lismarita, Azwar & Wanto (2022) states that using the environment as a learning medium can create more meaningful learning because students are faced with actual events and situations (Lismarita, 2022). In addition, through the environment, students are expected to foster a sense of love for the surrounding environment. Irwandi & Fajeriadi (2019) state that the environment is a direct learning resource that facilitates students to meet directly with the object to be studied in order to improve and make students more innovative.

Based on some of the explanations above, most of the biology lessons in high school have not used or provided learning resources in the form of modules.

Figure 3 Student responses to learning experiences that are integrated with local wisdom

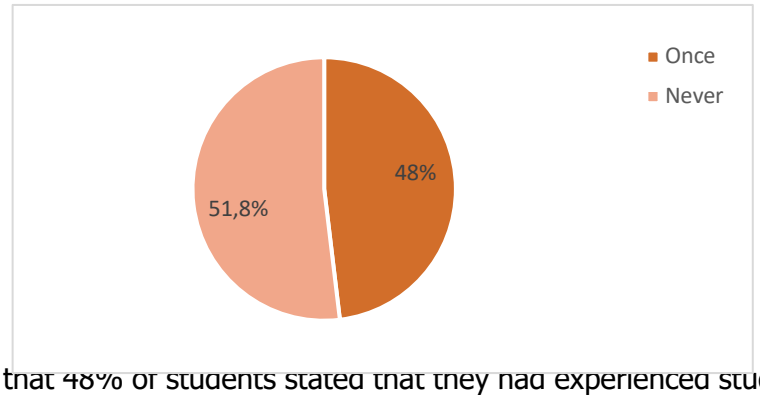


Figure 3 illustrates that 48% of students stated that they had experienced studying biology material integrated with local wisdom, and as a comparison, 51.8% of students admitted that they had never studied biology material integrated with local wisdom of Ternate, North Maluku. The diagram above explains that the integration of local wisdom has begun to be implemented in Indonesia, especially in biology learning. However, analytically there are still students who claim to have never studied biology material integrated with local wisdom. This is in line with the results of research conducted by Dewi (2019) which states that in general biology learning related to local wisdom still needs to be done. Kormasela, Dawud & Rofi'uddin's research (2020) also revealed that so far teachers have not made much use of local languages, in preparing Student Worksheets (LKS) Learning Implementation Plans (RPP) that are used are still standard by not linking local wisdom.

Figure 4. Local wisdom knowledge of Ternate, North Maluku

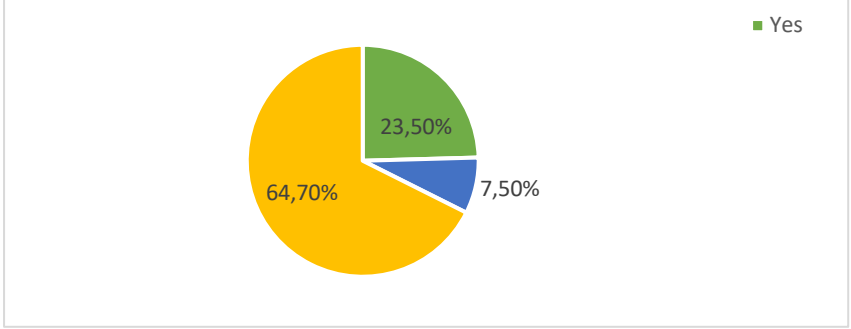
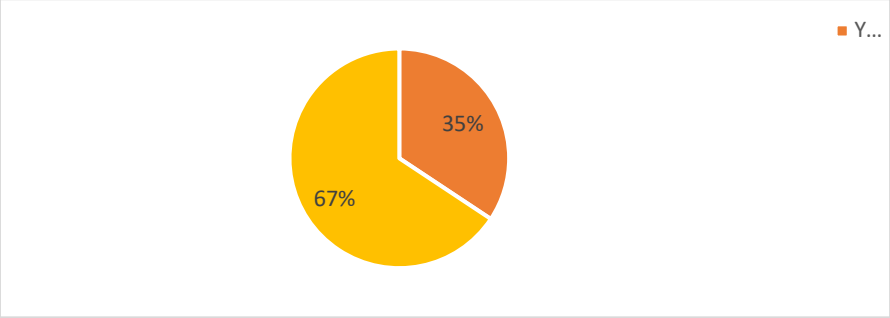


Figure 4 shows 7.5% of students do not know local wisdom of Ternate, 23.5% of students already know forms of local wisdom, and 64.7% of students claim to have knowledge of local wisdom in Ternate City, North Maluku, so it can be concluded that the highest percentage , most students at school do not know the various local wisdoms that exist in Ternate Island, North Maluku, for example the various tribes in North Maluku, namely the Togutil tribe, Togale tribe, Mange tribe in Taliabu and other tribes that have lived in North Maluku for a long time. Ternate Island, North Maluku has various local wisdom and natural resources, one example of local wisdom in Ternate City is the Legu Gam festival (Simabur, L. A. . , 2022), (LA HADE, M. S. D., KARMAN, A. S., & ABD RAHMAN, SAFRUDIN , 2021). The cultural diversity that exists in the Ternate region of North Maluku requires some local wisdom that still needs to be highlighted, and the literature is still limited, so that students find it difficult to explore and understand the local wisdom that exists on the island of Ternate, North Maluku.

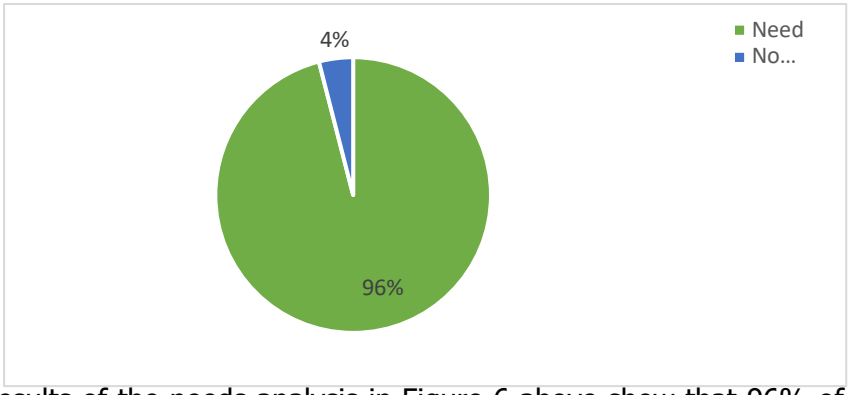
Susiati, Masniati & Iye (2021) explain that currently there has been a shift in social values of local wisdom, challenges agreed upon by the community and practiced jointly by community members have begun to fade. This is inseparable from the influence of changes in time. Explain that the progress of the millennial era offers a practical and contemporary side of the world that has caused generations to experience degradation of local wisdom values that existed before (Putri, 2022). Astuti (2016) stated that modern technology has caused the waning of local wisdom values. Thus, it is possible that the current generation needs to learn local wisdom in Indonesia, more specifically in their respective regions. This condition is a common concern for us to maintain the value or potential of the region so that it can be maintained so that the characteristics of the nation are maintained.

Figure 5. Definition (Introduction) of interactive modules



Based on Figure 5 above, it can be seen that 67% of students stated that they did not understand what an interactive module was, and only 35% of students stated that they understood interactive modules. This is the same as the reason stated in the explanation in Figure 2, that the availability of interactive modules is still very limited in almost all high schools in Ternate City, North Maluku. It is important for a teacher to be able to create learning resources that can increase student learning motivation and independence. Based on the research results of Hayanum & Sari (2022), many teachers are familiar with interactive modules with various features such as pictures, videos and quizzes as innovative and interesting teaching materials, so teachers can develop subjects that adapt to student characteristics and can be studied anywhere and anytime. . However, in reality there are still many teachers who only know interactive modules and still need help related to their lack of skills in producing interactive modules, lack of skills, time and funds. Related to this, Dewi & Lestari (2020) emphasized that teachers must have creativity and ideas to develop other learning resources, such as interactive modules. The results of his research also revealed that students prefer learning resources that look attractive, concise, clear, pictorial, and easy to understand. Teachers do not only rely on available textbooks to avoid boredom and monotonous learning.

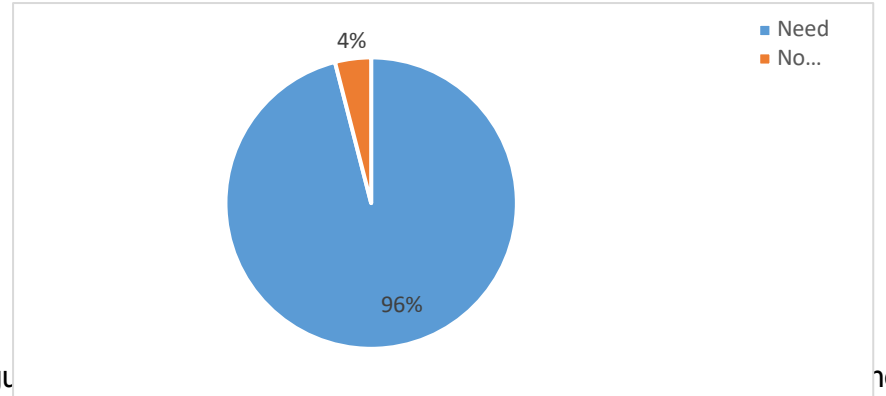
Figure 6. Analysis of interactive module needs



The results of the needs analysis in Figure 6 above show that 96% of students stated that they needed to develop interactive modules as another learning resource that would support biology learning. Gunawan & Widayat (2014) revealed that interactive modules are teaching materials that students can use for independent learning. Suarsana & Suwindra (2012) stated that some of the advantages of interactive modules are that they are equipped with various interesting features such as animation, audio, video, and other interesting features that enrich the student experience. Furthermore, revealed that interactive modules can provide independent learning experiences so students can solve problems in their own way (WAHYUNI, A. F., 2022).

The existence of textbooks or printed books that are generally used in learning has often caused students to need help to understand the material. The results of research conducted by Purwoko, that teaching materials in the form of textbooks cause problems for students, where students need help understanding learning material or problems that are abstract (Purwoko, 2020). Therefore, teachers and students need other supporting digital teaching materials as a companion learning resource. The existence of teaching materials that utilize technological advances will be more attractive to students. This is in line with the opinion of Ummah, Suarsini, & Lestari (2017) that currently students are more interested in learning resources that are easily available and easily accessible wherever and whenever. Today's students need learning modules that can not only be read in print but also need learning modules that are easily accessible via electronic media (Maryati, 2019). This is because this learning module can make it easier for students to increase motivation and interest in learning independently. revealed that learning materials packaged in the form of interactive content can increase students' enthusiasm and ability to learn (Sugiharti, 2019).

Figure 7. Student responses to the development of interactive modules based on Ternate local wisdom



Figu ng student needs for interactive modules based on the local wisdom of Ternate, North Maluku, in that 96% of the majority of students stated the need for module development as another learning resource that would support biology learning. The existence of printed books that dominate learning resources for students makes students lack learning experience, insight, and creativity, so it would be better if learning resources could take advantage of natural potential or the surrounding natural environment (Prasetya, 2016).

This is in line with science learning, namely equipping students with meaningful learning, so that using learning modules that integrate local wisdom and the potential of the natural environment is expected to help students understand material and various local wisdom in their area. Lestari, Lianah & Hidayat (2019) explained that integrating local wisdom in learning biology can support the function of value conservation and the environment so that it remains sustainable. Through this integrated module, students will be able to become literate, not only understanding biology material but also being able to solve daily life problems based on local wisdom. Learning that contains local wisdom can explore existing potential, can think, train, and familiarize students to build knowledge structures and students can solve problems independently, critically, and creatively.

CONCLUSION

Based on the results of the research that has been done, it is necessary to develop interactive digital modules based on the local wisdom of Ternate, North Maluku, especially in biology subjects in high school. The development of digital modules based on the local wisdom of Ternate, North Maluku, is expected to be able to visualize and present interesting material that can create meaningful learning. If the digital module produced is in accordance with the characteristics of students, it can increase student motivation because it contains some information related to the local wisdom of North Maluku Ternate as an addition to students' insights.

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