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Needs Analysis of the Biology Interactive Module Based on Bengkulu Local Wisdom

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Abstract

Packaging local wisdom in learning materials will make it easier to deliver the material, and students can connect their knowledge with the real situations they face. This research aims to analyze student needs for interactive digital modules based on Bengkulu local wisdom. This research type is the Research and Development (R & D) using the ADDIE model, but this research is limited to the Analyze stage. Data was collected by interviewing several biology subject teachers and giving questionnaires via google form to 96 students. The teachers and students involved were taken from several high schools in Bengkulu, Indonesia. The student needs analysis questionnaire includes seven indicators, and then the data obtained is analyzed through the qualitative description. The results show that: 1) the biology learning curriculum used in high school has not specifically been integrated with local wisdom, 2) the learning resources that have been used are textbooks, worksheets, e-books, environment, videos, and internet media, 3) as many as 52.1% of students admitted that they did not know and used interactive modules, 66.7% of students did not understand local wisdom in Bengkulu, and as many as 95.8% of students stated the need for interactive modules to support biology learning. Thus, it can be concluded that it is necessary to develop an interactive module based on Bengkulu's local wisdom as a supporting learning resource in learning biology.

Keywords: Needs analysis, Interactive module, Local wisdom, Biology learning

INTRODUCTION

A teacher must create fun and interesting learning for students by using interesting teaching materials that can increase student interest in learning. The module is one form of teaching material that we know so far in the form of a printed book, but along with the development of technology and science, the module has begun to transform into a digital format that can be accessed via laptop computers and smartphones. Digital modules are presented by integrating concepts, images, audio, and video. Digital modules have advantages, including that they do not require the cost of repairing the physical module, can be used remotely (can be accessed anywhere and anytime), and can help students learn independently (Khasanah & Nurmawanti, 2021). Digital or electronic-based modules can be one of the alternative teaching materials that can increase students' understanding alone (Suryani & Sandika, 2022). Teaching materials in the form of modules can allow students to learn independently and measure their mastery level of the material through available quizzes (Zulhaini et al., 2016). This is in line with the statement of Rahmawati (2012) that the advantage of the module compared to other teaching materials is that it can facilitate students to learn independently.

Daryanto (2013) states that there are 5 characteristics of the module, namely 1) Self-instructional (allows students to learn independently), 2) Self-contained (modules contain full learning material content as needed), and 3) Standalone (stand-alone). Which means that the module does not depend on other teaching materials, 4) Adaptive (modules must follow the development of science and technology up to date), 5) User friendly (modules are flexible and easy to use and understand by students both the language used, the display module and content delivered. Kumala & Sulistyowati (2016) revealed that so far, teachers have only used teaching materials in the form of textbooks, which seem to have not integrated learning with real daily life. Using textbooks containing general descriptions of the material can make learning meaningless and passive.

One way that can be done in introducing local wisdom to students is to integrate it into learning in the form of multimedia or modules that can facilitate and attract students' attention. The existence of a digital module based on local wisdom is in line with the direction of learning science (biology) which is a subject that is closely related to the environment (Andriana et al., 2017). Hadi & Dazrullisa (2018) explain that teaching materials are said to be good if they are developed according to the characteristics and needs of students by looking at geographical, ethnographic, and regional wealth factors. This is in line with fahrianoor's statement that teaching materials are ideal if they meet several criteria, including containing local wisdom content that aims to invite students to be in direct contact with biological material objects through activities and experiments. Parmin (2015), in his research, explains that integrating local wisdom in science learning (biology) has an essential meaning in strengthening the application of the concepts that have been learned. Therefore, Ramli (2013) revealed that there needs to be an emphasis on indigenous science local wisdom in biology learning. Using local wisdom content in learning, besides saving the knowledge of local wisdom itself, can also help students learn biology with real learning applications.

The study of local wisdom has begun to be pursued in the education curriculum, and it must be distinct from Bengkulu. In the research, Karyadi et al. (2016) revealed that developing science learning resources by integrating local potential can be the choice of educators or teachers to increase students' love and care for the surrounding environment. An example of research that examines Bengkulu's local wisdom and is integrated with learning media is the research conducted by Muktadir & Agustrianto (2014), who developed a model of teaching materials for local content subjects based on local wisdom to improve character in elementary schools. Lazuardi & Nugroho (2019) also conducted a similar study that developed a drama appreciation module based on local wisdom. Furthermore, Nata (2021), in

his research, also developed a science module based on the local wisdom of Ulu Musi South Sumatra for junior high school. The results of this literature review explain that interactive digital modules have yet to be developed based on Bengkulu local wisdom in biology learning in high school. The Bengkulu local wisdom-based module, developed with interactive digital technology, is the newest point in this research.

METHOD

This research is the Research and Development (R & D) using ADDIE model l(Analyze, Design, Develop, Implement, and Evaluate, Branch, 2009). This research is an early stage carried out before developing a product in the form of an interactive module based on Bengkulu local wisdom, so this research is limited to the Analyze stage.

This research was conducted in several senior high schools in Bengkulu City, Indonesia. Sampling technique using the purposive sampling technique, which is a sampling technique based on certain considerations (Cohen et al., 2007). Data were collected through interviews with four biology subject teachers from several high schools in Bengkulu City. In addition, the researcher also gave open and closed questionnaires to 96 students via a google form. The students involved were taken from representatives from 4 high schools in Bengkulu City.

The instruments used are structured interview sheets and questionnaire sheets. Interview sheets are used to collect qualitative data that will describe the biology learning curriculum that has been used, the integration of local wisdom in the curriculum, and the use of learning resources. In addition, a questionnaire sheet was used to collect quantitative data covering six aspects. The indicators and aspects that are used as benchmarks to obtain this need analysis data are: 1) the learning system used, 2) students' knowledge of interactive modules, 3) students' knowledge of local wisdom in Bengkulu, and 4) good learning resources used by students in learning biology, (5) student responses to learning resources in the form of interactive modules; (6) students' needs for the development of an interactive module based on Bengkulu local wisdom.

The data obtained from the interviews were analyzed qualitatively. The results will be used to strengthen and support the results of quantitative research (Amin et al., 2022), while the qualitative data will be analyzed through the help of the SPSS 23 program.

RESULTS AND DISCUSSION

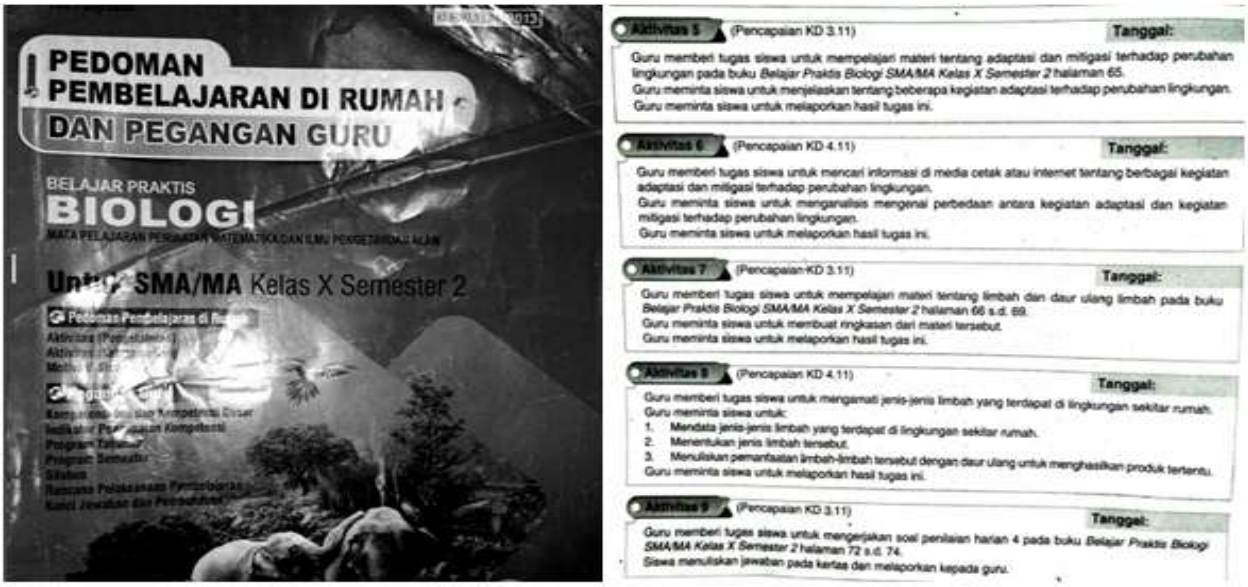
Researchers first analyzed learning outcomes and core competencies in biology learning as a first step. The researcher found that, in general, each material in biology learning was still developed according to learning achievement standards yet to be explicitly

written in the Basic Competencies and Core Competencies. This is also supported by the results of interviews with subject teachers who revealed that so far, biology learning has only focused on achieving the learning objectives that have been made in learning tools, not paying special attention to the special characteristics of an area and integrating them into learning.

In addition, this study also found that teachers are very interested in learning innovations that utilize technology, although the implementation has yet to be carried out due to various obstacles. The teacher admits that sometimes some materials are not explicitly taught in the classroom, such as environmental pollution, because the material is considered to be able to be learned by students independently by observing the surrounding environment without guidance from the teacher. Although it is realized that many things can be learned and applied from the deepening of the material, for example, creativity that has economic value can be done by students in waste management. Thus, the teacher admits that developing a technology-based biology module by integrating Bengkulu local wisdom can be an alternative to biology learning so that students can learn independently without direct guidance from the teacher in the classroom. In addition, the virtue of the module developed by facilitating students to able to discuss collaboratively directly through the same module and not requiring discussion group friends to be present in front of students will increase motivation and interest in learning. This module can also be integrated with a learning management system to make it easier for teachers, especially when implementing distance learning. Kun (2013) stated that it is undeniable that currently, teachers are still considered verbalist orators, including in science learning. This is based on the phenomenon that there are still many teachers who need to be more active as verbalist orators, so there need to be efforts that can increase teacher motivation to be more creative and able to create a conducive learning atmosphere and environment.

In addition, researchers also examined several learning resources available in schools with the following results: 1) the most frequently used learning resources were books and student worksheets in printed form, and there were no interactive learning media available 2) the learning resources used were not yet available elevating Bengkulu local wisdom. So far, learning has tried to be sourced from the environment, but teaching material needs to raise local wisdom. For example, in the analysis of environmental change material with the achievement of basic competence 4.11, the teacher gives assignments to students to observe the types of waste found in the environment around the house. From this achievement, it can be seen that the achievement of basic competencies has utilized the environment as a learning

resource for students to understand the types of pollution. Still, there has not been any visible achievement of competence through the study of local wisdom in the area in Bengkulu. The following Figure 1 is an example of a student worksheet that is generally used in schools.



student worksheets

The results of the questionnaire analysis given to students from several high schools in Bengkulu City for each indicator are shown as follows:

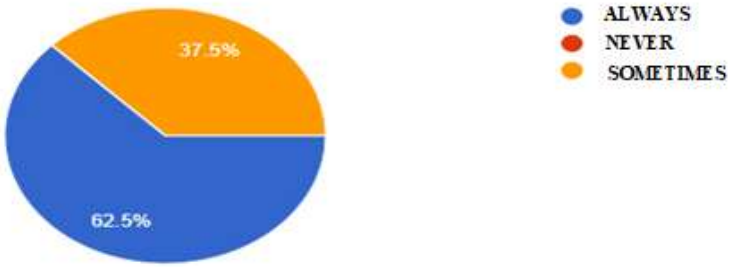


Figure 2. Student responses to the student center learning system

Figure 2 shows that 62.5% of students stated that the learning system was always student-centered. In comparison, 37.5% of students revealed that learning biology in schools only sometimes involved students actively participating. Based on this data, biology learning in several Bengkulu city high schools have primarily implemented student-centered learning. This is because high school learning in Bengkulu City has implemented curriculum 13, where the curriculum allows a student-centered learning process. In line with the expression of Julfahnur et al. (2019), the 2013 curriculum emphasizes all student competencies, attitudes, skills, and knowledge, which is student-centered through a scientific approach. The application of this curriculum directs students to only sometimes depend on information from

the teacher but to be able to independently solve problems, propose hypotheses, collect data, analyze data and make conclusions. This is supported by the opinion of Prasetyawati (2019) that implementing the 2013 curriculum requires student-centered learning; therefore, the implementation of the learning process is expected to use a scientific approach or a scientific approach. The scientific approach can facilitate students in strengthening integrated attitudes, skills, and knowledge to produce productive, effective, innovative, and creative students. It was also mentioned that through a scientific approach, the learning process would be more effective than traditional learning. As mentioned by Kurniaman & Noviana (2017) in their research, the implementation of the 2013 curriculum is different from the previous curriculum, wherein the implementation of learning students are more active and enthusiastic in learning. Students are required to be more critical and independent to grow the values of attitude, curiosity, and self-confidence in every learning process. In addition, Subagiyo & Safrudiannur (2014) and Wagiran (2015) stated that based on the results of data analysis, it is known that in general, teachers already have the readiness to implement curriculum 13 in the medium and high categories, so can support the implementation of this curriculum. Although certain aspects are known to be low, such as preparing assessments and mastery of teaching materials.

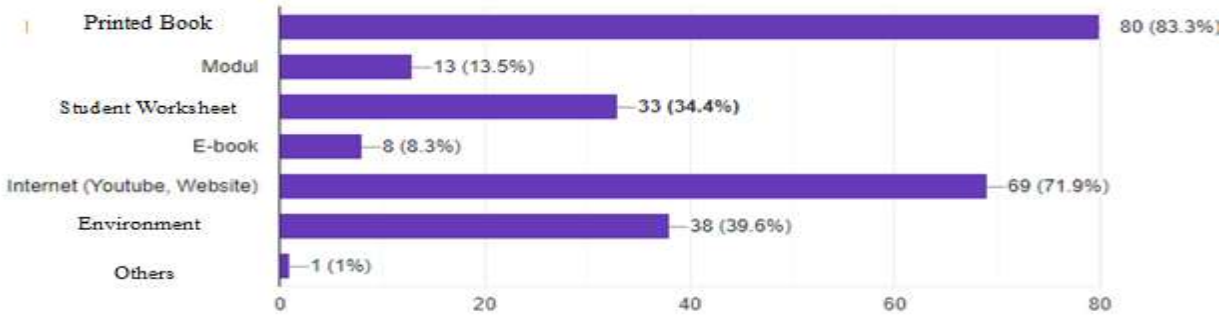


Figure 3. Learning resources used in learning biology

Figure 3. describes that the most widely used learning resources are textbooks or printed books, as much as 83.3%. Other learning resources that students widely use are the internet (youtube, website), as much as 71.9%, environment at 39.6%, student worksheets at 34.4%, modules at 13.5%, and E-Books at 8.3%.

The data describes that learning resources through modules and E-Books are the learning resources that students learning biology rarely use. This is due to the need for more available learning resources in the form of modules in schools. Gustinasari et al. (2017) revealed that only the majority of students use printed books as a learning resource, and there

is no availability of teaching materials in the form of biology learning modules in schools because teachers still think printed books are circulating are representative of use in learning. In addition, due to limited funds and time in developing other teaching materials. In the research, Yusnira et al. (2018) explained that biology learning only refers to printed books.

It is undeniable that not a few students have used other learning resources such as youtube by accessing the internet. The data shows that learning resources from the internet are students' second largest learning resource. This is because technological advances that provide various learning resources make students more familiar with and easier to access all information anywhere and anytime. Suradika et al. (2020) revealed that YouTube is a digital platform that is quite popular as a learning resource. Oktapiyani et al. (2021) stated that the media has an important role in learning, where the right learning media can increase students' motivation. One of the media widely used today is YouTube, which provides audio-visual media for learning. Mujianto (2019) One of the most popular social media networks today is YouTube. Youtube is allegedly able to increase students' interest and motivation in learning. Purwandari (2019) also revealed that a widely used alternative learning source is YouTube because it can be a source of information and entertainment for students, so it becomes more interesting.

The graphic also shows that in learning biology at school, students are also accustomed to using student worksheets and the environment as a supporting learning resource. This is in line with efforts in implementing the 2013 curriculum, which emphasizes a scientific approach to biology learning and has begun to familiarize students with using the environment as a learning resource. Meliawati et al. (2015) revealed that the scientific approach directs students to construct their knowledge through observing, formulating problems, proposing hypotheses, collecting data, analyzing, and drawing conclusions. Adinugraha (2017) states that scientific learning directs students to be able to produce products so that the learning that occurs becomes more meaningful. Efendi (2013) states that using the environment as a learning medium can create more meaningful learning because students are faced with actual events and circumstances. In addition, through the environment, students are expected to foster a sense of love for the surrounding environment. Irwandi & Fajeriadi (2019) stated that the environment is a direct learning resource that accommodates students to meet directly with the object to be studied to increase student productivity.

Based on some of the explanations above, most biology learning in senior high schools has not used or provided learning resources in the form of modules.

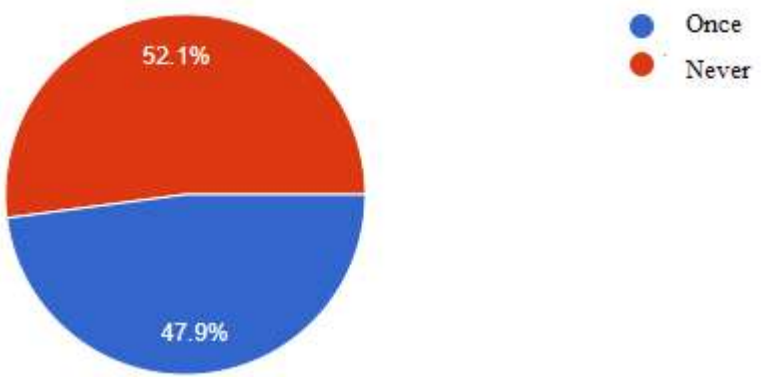


Figure 4. Student responses to learning experiences that are integrated with local wisdom

Figure 4 describes that 47.9% of students stated that they had a biology learning experience integrated with local wisdom. In comparison, 52.1% of students admitted that they had never studied biology material by connecting it to Bengkulu's local wisdom. The diagram above explains that the integration of local wisdom has begun to be applied in biology learning. However, analytically there are still students who claim to have never integrated it. This is in line with the results of Putri & Darussyamsu's (2021) research, which states that, generally, biology learning associated with local wisdom still needs to be done. Tomi et al.'s research (2018) also states that so far, teachers have not made much use of local wisdom in studying biology. The Learning Implementation Plan (RPP) and Student Worksheet (LKS) used are still standard.

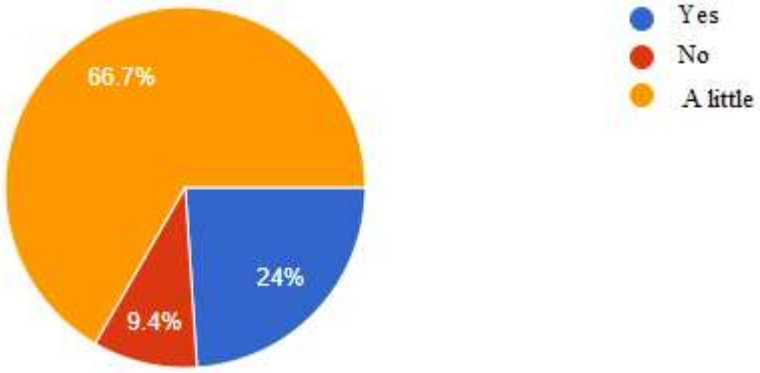


Figure 5. Understanding (knowledge) of Bengkulu local wisdom

Figure 5 shows that 9.4% of students do not know about Bengkulu local wisdom, 24% of students already know the form of local wisdom, and 66.7% of students admit that they have little knowledge of local wisdom in Bengkulu City. It can be concluded that most high school students do not know enough about various Bengkulu local wisdom inhabited by various tribes such as the serawai tribe, Rejang tribe, the pekal tribe, and other tribes who have lived in Bengkulu for a long time. This strengthens Bengkulu to have local wisdom and

diverse natural resources; where one example of local wisdom in Bengkulu is the tabot festival (Megayanti & Elcaputra, 2019). The diversity of Bengkulu regional culture causes some local wisdom that still needs to be more prominent, and there is still limited literature, so, naturally, today's children have difficulty exploring and understanding local wisdom in Bengkulu.

Hidayati (2016) explained that currently, there has been a shift in the social values of local wisdom, and the challenges agreed upon by the community and practiced by community members together are starting to fade. This is inseparable from the influence of changing times. Wulandari & Lamopia (2019) explained that the progress of the era of millennials offers a practical and contemporary side of the world. It has caused the generation to experience the degradation of the values of local wisdom that had existed before. Fajarini (2022) also mentions that modern technology has caused the waning of the value of local wisdom. Thus, it is possible that the current generation needs to learn the local wisdom in their area. These conditions are our concern on maintaining regional values or potentials so that the characteristics of the nation are maintained.

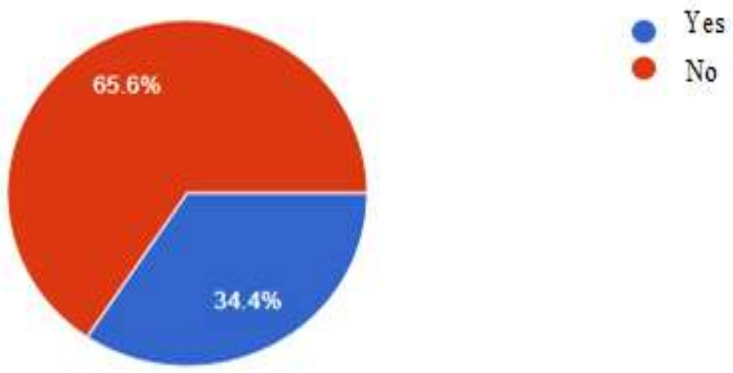


Figure 6. Understanding (Introduction) of interactive modules

Based on Figure 6 above, it can be seen that 65.6% of students admitted that they did not know or understand what an interactive module was. Only 34.4% admitted that they previously knew about interactive modules. This is similar to the reason expressed in the explanation in Figure 2, that the availability of interactive modules is still very limited. Not all schools have facilitated students to learn independently through interesting learning media. A teacher is important in realizing learning resources that can increase students' learning independence and motivation. Based on the research results by Oktavia et al (2020), teachers have recognized interactive modules with various features such as pictures, videos, and quizzes as innovative and interesting teaching materials. So they will be suitable to be developed by the subject teachers who adapt to students' character and can be studied

anywhere and anytime. Even though, in reality, many teachers still need help in interactive modules, such to a lack of skills, time, and funds. In their research, Dewi & Lestari (2020) confirms that teachers must have creativity and ideas to develop other learning resources, such as interactive modules. His research also states that students prefer learning resources that look attractive, concise, clear, have pictures, and are easy to understand. Teachers don't just rely on the available textbooks to avoid boredom, confusion, and monotonous learning. In reality, many teachers still experience problems making interactive modules, such as a lack of skills, time, and funds. In their research, Dewi & Lestari (2020) confirms that a teacher must have creativity and ideas to develop other learning resources, such as interactive modules. His research also states that students prefer learning resources that look attractive, concise, clear, have pictures, and are easy to understand. Teachers don't just rely on the available textbooks to avoid boredom, confusion, and monotonous learning.

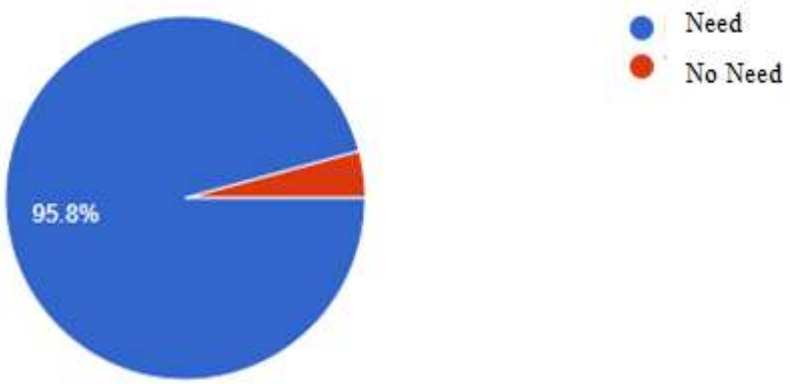


Figure 7. Analysis of interactive module requirements

The needs analysis results shown in Figure 7 describe 95.8% of students stating the need to develop interactive modules as other learning resources that will support biology learning. Widyastutik & Rudyatmi (2021) revealed that interactive modules are teaching materials that students can use for independent study. Suarsana & Mahayukti (2013) state 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. It can be played or played by students repeatedly so that they can enrich the student experience. Furthermore, Hamzah & Mentari (2017) revealed that interactive modules could provide independent learning experiences so that students can solve problems in their way.

The existence of textbooks or printed books which are generally used in learning, often causes students to need help understanding the material. This follows the results of research conducted by Purwoko et al. (2020) that teaching materials in the form of textbooks often

cause problems for students, where students need help learning material or problems that are abstract. Therefore, teachers and students need digital teaching materials supporting other learning resources. The existence of teaching materials that utilize technological advances will be more attractive to students today. This is in line with the opinion of Ummah et al. (2017) that currently, students are more interested in learning resources that can be easily accessed anywhere and anytime. Deviana & Sulistyani (2017) Current students need learning modules that can not only be read in print but also require learning modules that are easily accessible via electronic media. This is because this learning module can facilitate students to increase motivation and interest in independent learning. Abadi et al. (2018) emphasize that learning materials packaged in the form of interactive content can increase student enthusiasm for

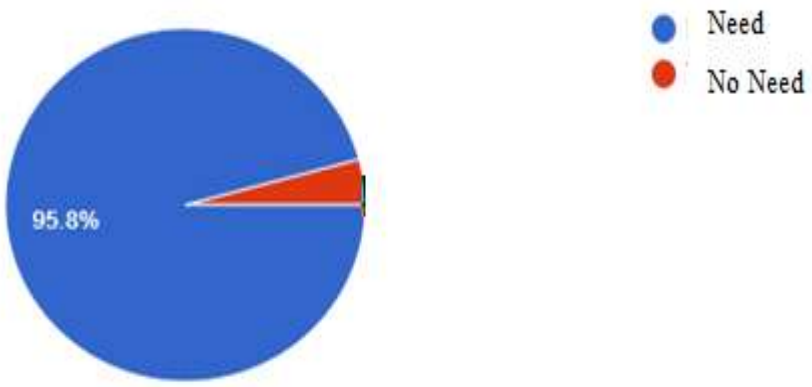


Figure 8. Student responses to the development of an interactive module based on Bengkulu local wisdom

Figure 8 is the final description of the indicators for analyzing student needs for an interactive module based on Bengkulu local wisdom, where most of the 95.8% of students stated the need for the development of the module as another learning resource that would support biology learning. Widiya et al., (2021), the existence of printed books that dominate learning resources for students makes students lack experience, insight, and creativity, so it would be better if learning resources could take advantage of the potential of nature or the surrounding environment. This is in line with learning natural sciences, namely providing students with meaningful learning and real experiences. Thus integrating learning modules with local wisdom is expected by integrating learning with the environment can help students understand the material. Monica et al. (2021) explained that integrating local wisdom in biology learning can support the function of value conservation and environmental preservation. Through this integrated module, students will be able to become literate, not

only understanding biological material but also being able to solve problems of daily life based on local wisdom. Learning that contains local wisdom can explore the potential for thinking, training, and familiarizing students to build students' knowledge structures in solving problems independently, critically, and creatively.

Several studies have revealed that learning modules integrated with local wisdom can help students learn, including research conducted by Fitriani et al. (2019) and Khaerani et al. (2020). The results state that the natural science learning module based on local wisdom can improve student learning outcomes. Furthermore, Wahyuni's (2015) research results explain that teaching materials integrated with local wisdom can improve students' critical thinking. Almuharomah et al. (2019) in their research stated thatThe STEM-based module integrated with local wisdom "beduk" can enhance creative thinking skills and is suitable for use as a companion to textbooks at school. Nisa et al. (2015) stated that using an integrated ethnoscience module in problem-based learning effectively improves students' scientific literacy skills. Hasani et al. (2019) explained that the use of modules containing local wisdom with a cooperative model was able to improve science process skills and students' character.

CONCLUSION

Based on the results of the research that has been done, there is a need for the development of interactive digital modules based on Bengkulu local wisdom in biology learning. Students hope that through a digital module based on Bengkulu local wisdom, which interestingly presents material and can visualize it, it can create meaningful learning. Digital modules that are tailored to student characteristics can help deliver material, so learning can be more fun and increase student motivation. In addition, the digital biology learning module, which contains some information related to the local wisdom of Bengkulu, can add to the students' insight.

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