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# FEASIBILITY AND PRACTICALITY OF PROJECT-BASED LEARNING (PJBL) TEACHING MODULES BASED ON LOCAL POTENTIAL TO SUPPORT THE IMPLEMENTATION OF THE INDEPENDENT HIGH SCHOOL CURRICULUM

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**ABSTRACT:** The purpose of this study was to determine the feasibility and practicality of the PjBL Teaching Module based on the local potential of the Gandong River on water pollution material to support the implementation of the Independent Curriculum in high schools. This research method is descriptive quantitative, using the ADDIE approach model, which was implemented from December 2023 to January 2024. The subjects of the study were 1) Biology learning experts, 2) Material Experts, 3) Teachers and 4) Grade X high school students. The data collection method for this study was to fill out assessment sheets by experts and practitioners. The instruments used in this study were 1) the feasibility of learning experts, 2) the feasibility of material experts and 3) practicality. The data were analyzed using quantitative descriptive methods to obtain the percentage of feasibility and practicality of the teaching module. The results showed an average expert assessment of 83.63% (very feasible), teacher practitioners 73% (practical) and student practitioners 82.75% (very practical). These results indicate that the PjBL teaching module based on the local potential of the Gandong River is feasible and practical as a learning tool for grade X water pollution material.

**ABSTRAK:** Tujuan penelitian ini mengetahui kelayakan dan kepraktisan Modul Ajar PjBL berbasis potensi lokal Sungai Gandong materi pencemaran air untuk mendukung implementasi Kurikulum Merdeka di SMA. Metode penelitian ini deskriptif kuantitatif dengan model pendekatan ADDIE yang dilaksanakan Bulan Desember 2023-Januari 2024. Subjek penelitian yaitu 1) Ahli pembelajaran biologi, 2) Ahli Materi, 3)

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praktisi. Instrumen yang digunakan dalam penelitian yaitu 1) kelayakan ahli pembelajaran, 2) kelayakan ahli materi dan 3) kepraktisan, guru dan 4) Siswa kelas X. Metode pengumpulan data penelitian ini dengan pengisian lembar penilaian oleh ahli dan Data dianalisis dengan deskriptif kuantitatif untuk memperoleh persentase kelayakan dan kepraktisan modul ajar. Hasil penelitian menunjukkan rata-rata penilaian ahli 83,63% (sangat layak), praktisi guru 73% (praktis) dan praktisi siswa 82,75% (sangat praktis). Hasil ini menunjukkan bahwa modul ajar PjBL berbasis potensi lokal Sungai Gandong layak dan praktis sebagai perangkat pembelajaran materi pencemaran air kelas X.

## INTRODUCTION

The curriculum was created with the aim of facilitating the implementation of learning (Vhalery et al., 2022). In its implementation, the curriculum in Indonesia has been changed several times, starting in 1947, and the most recent is the Independent Curriculum. The first Indonesian curriculum in 1947 was known as the "*Leer Plan*". In general, this curriculum was oriented towards Dutch education for national interests, but its implementation remained with the principles of Pancasila. Continued in 1952, the curriculum and the term were updated *"Rentjana Pelajaran Terurai"* In the curriculum, each subject already has 1 syllabus. Furthermore, in 1964 the curriculum was refined again to become *"Rentjana Pendidikan"*, in this Curriculum the subjects are grouped into 5, starting from morals to knowledge. In 1968, the subjects developed more rapidly into 9 subjects, but the focus of learning in this Curriculum produced Pancasila humans. If in previous years, the development of the Curriculum focused on the development of the number of subjects, starting in 1975, the development of the Curriculum began to focus on the components of the Curriculum and concentrate on student competencies. For example, the 1984 Curriculum began to implement student-focused learning, but it was still less effective because it was difficult to control students. In 1994, national and local content materials began to appear. The 2004 Curriculum learning was more varied, and learning emphasized the process and outcomes of education. The 2006 Curriculum began to emerge Competency Standards, Basic Competencies, and schools developed their own needs. The 2013 Curriculum focuses on developing student competencies in Attitude, Knowledge and Skills. Then the newest and most currently used is the Independent Curriculum.

The Independent Curriculum was born to address education problems after the COVID-19 pandemic (Istaryatiningtias and Silviana, 2021). The changes are a logical consequence of the changes in society's political, socio-cultural, economic, and science and technology systems. The curriculum, as a set of educational plans, needs to be developed dynamically in accordance with the demands and changes that occur in society (Alhamuddin, 2014). This curriculum change encourages a paradigm shift in learning (Violeta and Achadi, 2024). For example, strengthening teachers' independence as those in control of the learning process, removing standards that are too binding and demanding, and focusing more on developing students' character and skills (Alimuddin, 2023; Ardianti and Amalia, 2022).
Findings by (Damiati et al., 2024) The implementation of the Independent Curriculum brings significant changes to educators in schools, both in terms of administration, learning strategies and approaches, learning methods, and even the learning evaluation process. This change will clearly give rise to various obstacles in the learning process. For example, the results of

research by (Mujab et al., 2023; Sasmita and Darmansyah, 2022) found that the obstacles to implementing the Independent Curriculum in schools include the procurement of teaching materials, learning devices, or facilities needed to teach in accordance with the Independent Curriculum. Furthermore (Kurniati and Kusumawati, 2023; Melani and Gani, 2023; Resmiyati et al., 2024) also found that the obstacle in implementing the independent curriculum is the procurement of learning devices known as Teaching Modules.

Learning devices are one of the supports for the implementation of learning (Bannang et al., 2023). Learning can achieve the set goals if the learning scenario can be designed as well as possible (Nurma et al., 2024). According to Refmianti et al. (2023) and Salsabilla and Jannah (2023) Teachers in educational units are required to compile complete and systematic teaching modules so that learning takes place interactively, is fun and challenging, motivating students to participate in learning actively. In fact, the results of interviews with Biology Teachers at Senior High Schools in Magetan Regency show that teachers still use teaching modules provided by the government. Teachers still have limited time in the process of compiling teaching modules, so Teachers have not yet compiled teaching modules independently. In addition, the Biology Subject Teachers' Conference in Megatan Regency has not yet socialized the compilation of independent curriculum teaching modules. Therefore, in the learning process, teachers also do not utilize the surrounding environment as a means of learning, one of which is local potential in biology learning.

Local potential is the potential owned by a particular region, whether in the form of resources, services, arts, culture or wisdom (Nurhidayati, 2019). Integrating local potential in learning creates more contextual learning (Nurhayani et al., 2024; Putri et al., 2024; Sari et al., 2023). Students become more familiar with the learning material presented because it combines social reality and the student's learning environment (Lestari et al., 2024; Pamenang, 2021). The results of previous research show that the integration of local potential in biology learning can maximize learning outcomes, for example, increasing scientific literacy and scientific process skills (Sary et al., 2023), science process skills and 21st century skills (Mukaromah et al., 2022), students' thinking skills and competencies (Fauzi et al., 2024) can even have a positive impact on continuing education and the preservation of local culture (Lestari et al., 2024). Therefore, it can be concluded that integrating local potential is worthy of use in learning because it makes learning more contextual and meaningful for students (Kamila et al., 2024).

Despite the potential that exists, research into the integration of local potential into the Independent Curriculum learning tools is still minimal (Zakariyah et al., 2024). Findings by Fauzi et al. (2024) It also shows that the development of local potential research in biology learning in Indonesia is still low. This finding is also in line with the facts in the field that Biology Teachers in Magetan Regency have obstacles in involving local potential in learning, one of which is the capacity to process local potential so that it can be used in learning. The results of research by Sari et al. (2023) that Magetan Regency has various local potentials that are representative and can be used as sources for learning biology, one of which is the Gandong River (Sari, 2023). Although representative, many local potentials have not been integrated into the learning process. The interview results also found that teachers still do not understand how to incorporate local potentials so that they can be utilized in learning.

According to Khotimah et al. (2024) and Rohmah et al. (2025) Involving local potential in learning must consider several aspects, such as the feasibility and practicality of local potential as teaching materials. The feasibility assessment in selecting local potential as a learning resource aims to ensure that the local potential utilized is truly effective and efficient.

Appropriate learning resources can help students understand the material more easily so that learning objectives can be achieved (Sari et al., 2023; Sari and Suhartini, 2024). In addition to being worthy, the product must also be practical. According to Aldina et al. (2023) The assessment of the practicality of learning products aims to determine their ease of use. Therefore, it is necessary to conduct a study that can elaborate on the current Curriculum needs with local potential in order to create contextual learning that is more concerned with the environment. The purpose of the study is to describe the feasibility and practicality of the PjBL teaching module based on the local potential of Gandong River to support the implementation of the Independent Curriculum for High Schools in Biology Learning in Magetan Regency.

## RESEARCH METHOD

### Types of research

Research on the feasibility and practicality of the PjBL Teaching Module based on the local potential of the Gandong River was conducted using the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development research model. This research was only conducted up to the development stage, namely an assessment of experts and practitioners, which aims to determine the feasibility and practicality of the PjBL Teaching Module based on the local potential of the Gandong River as a learning tool for water pollution material for class X. The research was conducted from December 2023 to January 2024.

### Research subject

The subjects in this study involved subjects for the feasibility and practicality trial of the teaching module. The subjects of the feasibility trial included learning strategy experts and material experts, while the practicality involved teacher practitioners and students, further explained in Table 1.

**Table 1.** Research subjects

| Subjects | | Criteria | Information |
|---|---|---|---|
| Feasibility Product | Biology learning strategist | 1. Minimum qualification of doctor/Ph.D<br>2. Have experience in the field for at least 5 years | 1 lecturer of biology education from the faculty of mathematics, yogyakarta state university, with expertise in biology learning strategies |
| | Subject matter expert | 3. Have expertise in learning strategies and environmental science | 1 lecturer of biology education from the faculty of mathematics, yogyakarta state university, with expertise in environmental science |
| Practicality product | Teacher Practitioner | 1. Minimum of S1 Biology Education<br>2. Have a minimum of 5 years teaching experience | 1 biology teacher from senior high school 1 Barat |
| | Student Practitioner | Have taken environmental pollution material | 33 students grade X from Senior High School 1 Barat |

**Data Collection Methods and Instruments**

The data collection method was carried out in a non-test manner, in the form of expert and practitioner feasibility assessment sheets. The non-test instruments used in this study were biology learning expert assessment sheets, material expert assessment sheets, practitioner (teacher) assessment sheets and practitioner (student) assessment sheets (Table 2). The assessment sheets used 5 assessment scales, namely the Likert scale. Score (1) Very lacking, (2) Lacking, (3) Sufficient, (4) Good and (5) Very good. The results of the assessment by experts and practitioners were used as considerations for the PjBL teaching module based on the local potential of Gandong River.

**Table 2.** Assessment grid for the feasibility and practicality of teaching modules by experts and practitioners

| **Feasibility : Biology learning expert and material expert** | | |
|---|---|---|
| **No** | **Aspect** | **Assessment indicator** |
| 1. | Teaching module identity and time allocation | Accuracy and clarity of the identity of the teaching module<br>Completeness of the identity of the teaching module<br>Accuracy of the time allocated in the learning process |
| 2. | Formulation of learning indicators and objectives | Suitability of indicator formulation with learning objectives<br>Accuracy of operational verbs in learning indicators and learning objectives<br>Coverage of indicator formulation of at least 2 indicators |
| 3. | Material selection | Sequence of material arrangement<br>Completeness and clarity of material<br>Suitability of material to learning objectives<br>Suitability of material to educational level |
| 4. | Selection of learning models | Suitability of the selection of learning models with learning objectives<br>Suitability of the selection of learning models with learning materials |
| 5. | Selection of sources, media and learning materials | Suitability between media, sources and teaching materials with learning objectives<br>Ease of use of media, sources and teaching materials |
| 6. | Suitability of learning scenarios | Conformity to the syntax or learning steps used |
| 7. | Assement | Accuracy in determining assessment techniques and learning objectives<br>Completeness of assessment instruments |
| 8. | Language | Accuracy of language use<br>Clarity of language use |
| **Practicality: Biology teacher** | | |
| **No** | **Aspect** | **Assessment indicator** |
| 1. | Suitability of materials | The material presented is in accordance with the water pollution material<br>The material presented is in accordance with the facts |

| | | |
|---|---|---|
| | | The material used is efficient to improve student understanding |
| | | The images are informative |
| | | The literature presented is in accordance with the water pollution material |
| 2. | Update of materials | The material presented is in accordance with the water pollution material |
| | | The material presented is in accordance with developments |
| | | The local potential studied has relevance to the material |
| 3. | Suitability of enrichment and remedial | Remedial presented according to the students |
| | | Enrichment presented according to the students |
| 4. | Suitability of detailed learning plans | Suitability of learning model syntax |
| | | Suitability of facilities and infrastructure |
| 5. | Conformity of meeting details | Suitability of time allocation |
| | | Compliance of success indicators |
| | | Suitability of the starter question |
| 6. | Suitability of assessment | Suitability of assessment domain with assessment technique |
| | | Suitability of assessment domain with assessment instrument |
| 7. | Compliance of materials and attachments | Suitability of assessment material and attachments |

| **Practicality: Students** | | |
|---|---|---|
| **No** | **Aspect** | **Assessment indicator** |
| 1. | Attracting students' attention | Learning process until completion |
| | | Implementation of learning with focus |
| | | Learning scenarios create active learning |
| 2. | Increasing understanding | The material presented is easy to understand |
| | | The material presented helps understanding |
| 3. | Providing sources of information | The sources presented are relevant |
| 4. | Benefits of Student Worksheets | Worksheets is in accordance with the material |
| | | Worksheets helps understanding the material |

Source: (Karmadi, 2023)

### Data analysis techniques

The results of the Expert and Practitioner feasibility assessment of the teaching module were analyzed descriptively quantitatively, which were then interpreted in Table 3 to obtain the product feasibility or practicality category.

**Table 3.** Percentage of feasibility and practicality of teaching modules

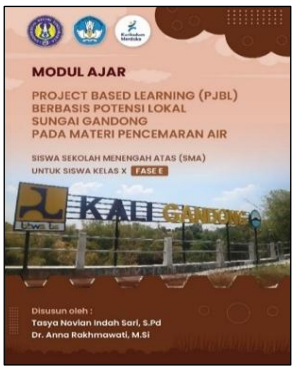
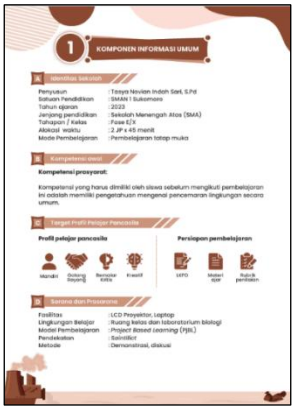
| Percentage of achievement | Feasibility | Practicality |
|---|---|---|
| 76%-100% | Very Feasible | Very practical |
| 56-75% | Feasible | Practical |
| 26%-55% | Less feasible | Less practical |
| 0%-25% | Not feasible | Not practical |

## RESULTS AND DISCUSSION

### Characteristics of PjBL Teaching Modules based on local potential for water pollution material for class X

The teaching module compiled in this study is the Project Learning Teaching Module based on the local potential of the Gandong River and presented in Indonesian. This teaching module or learning device is used in the material on water pollution for class X students or phase E in the implementation of the independent curriculum.

**Table 4.** Example of a PjBL Teaching Module Display based on the local potential of the Gandong River

| No | Description | Example of Teaching Module Display |
|---|---|---|
| 1. | Front page view of the PjBL Teaching Module based on the local potential of the Gandong River |  |
| 2. | Identity section of the PjBL teaching module based on local potential of Gandong River |  |
| 3 | Learning activities in the PjBL teaching module based on the local potential of the Gandong River. Implementation of learning in three meetings |  |

In general, the PjBL teaching module based on the local potential of the Gandong River consists of three learning activities. The first meeting contains steps 1) determining questions, 2) preparing a project plan, and 3) determining the project activity schedule. The second meeting includes steps for monitoring project activities. Finally, the third meeting contains steps 1) assessing results and 2) evaluating student experiences. The teaching module is also equipped with learning attachments, which include materials, assessments and worksheets supporting the learning process.

The learning model used in the teaching module is PjBL. The project activities involved are water filter tool manufacturing projects. The manufacturing of water filter tool projects is also connected to the involvement of the local potential of the Gandong River in learning. The Gandong River is one of the rivers that stretch across the Magetan Regency and is also the largest river in the Magetan Regency. As the largest river, this river is connected to the Bengawan Solo River. From the past until now, the surrounding community still uses this river for life, for example, irrigation, households, fisheries, livestock, and industry (Ilham, 2018; Lufira et al., 2020). Apart from being useful for life, recently this river has been converted into a place to dispose of waste from the leather craft industry by several irresponsible illegal craftsmen.

**Results of the Feasibility Assessment of the PjBL Teaching Module based on local potential for class X water pollution material**

The assessment of feasibility of the PjBL teaching module based on the local potential of the Gandong River was assessed by two experts in the fields of biology and environmental learning because the teaching module in this study contains water pollution material. In general, the results of expert assessments on 8 aspects of the feasibility of the teaching module showed that the average of each element obtained decent results (Table 5). These results indicate that the PjBL teaching module based on the local potential of the Gandong River is feasible to be used as a learning tool for water pollution material for grade X students.

**Table 5.** Results of Teaching Module Feasibility Assessment by Learning Experts

| No | Aspect | Expert 1 | Expert 2 | Average | Category |
|---|---|---|---|---|---|
| 1. | Identity of teaching modules and time allocation | 95% | 85% | 90% | Very feasible |
| 2. | Formulation of indicators and learning objectives | 88% | 80% | 84% | Very feasible |
| 3. | Selection of materials | 84% | 80% | 82% | Very feasible |
| 4. | Selection of learning models | 80% | 80% | 80% | Very feasible |
| 5. | Selection of sources, media and learning materials | 100% | 80% | 90% | Very feasible |
| 6. | Suitability of learning scenarios | 89% | 75% | 82% | Very feasible |
| 7. | Assessment | 80% | 72% | 76% | Feasible |
| 8. | Language | 70% | 100% | 85% | Very feasible |
| Average | | | | 83,63% | Very feasible |

Apart from the assessment results in Table 5, there are several suggestions and inputs given by the Expert on the teaching module (Table 6). The suggestions and inputs given by the Expert become a follow-up for the process of improving the teaching module product in the next stage.

**Table 6.** Suggestions and Input from learning experts and material experts on teaching modules

| Biology learning expert | Subject matter expert |
|---|---|
| PjBL learning syntax must be more operational in learning<br>Assessment sheets must be clarified | Compliance of question indicators with questions on the assessment sheet |

**Results of the Practicality Assessment of the PjBL Teaching Module based on local potential for water pollution material for class X**

The following result of the assessment of the PjBL teaching module based on the local potential of the Gandong River is practical. The results of the practicality assessment by the Biology Teacher from Senior High School 1 Barat are in Table 7. On average, each aspect of the evaluation shows that the PjBL teaching module based on the local potential of the Gandong River is practical to use as a learning tool and is used in learning about water pollution material for class X students.

**Table 7.** Results of the Practicality Assessment of Teaching Modules by Biology Teachers

| No | Aspect | Average Teacher | Category |
|---|---|---|---|
| 1. | Suitability of materials | 80% | Very practical |
| 2. | Updated materials | 80% | Very practical |
| 3. | Suitability of enrichment and remedial | 70% | Practical |
| 4. | Suitability of learning design details | 69% | Practical |
| 5. | Suitability of meeting details | 73% | Practical |
| 6. | Suitability of assessments | 70% | Practical |
| 7. | Suitability of materials and attachments | 70% | Practical |
| **Average** | | **73%** | **Practical** |

In addition to being assessed by the teacher, practicality is also assessed from the perspective of students. The students involved in this study were 33 students in grade X of Senior High School 1 Barat. The results of the practicality assessment by students in all aspects in Table 7 obtained an average category of very practical.

**Table 8.** Results of the Practicality Assessment of the Teaching Module by Students

| No | Aspect | Average Teacher | Category |
|---|---|---|---|
| 1. | Attracting students' attention | 80% | Very practical |
| 2. | Increasing understanding | 85% | Very practical |
| 3. | Providing sources of information | 81% | Very practical |
| 4. | Benefits of Student Worksheets | 85% | Very practical |
| Average | | 82,75% | Very practical |

Learning tools are short-term planning to estimate what will be done in learning. Learning tools function to encourage teachers to be more prepared to carry out learning activities, and to make the learning process effective according to what is planned ( Sari, 2020). According to Rajabi et al. (2015) Learning devices are developed from the syllabus to direct students' learning activities in an effort to achieve basic competencies. The preparation of good learning devices will be able to improve students' learning outcomes (Sugiyanto and Erviana, 2022). Atika et al. (2020) conveyed that the characteristics of good learning devices include activities that can provide experience for students, learning steps are arranged systematically, and in detail. The results of the study in the Table show that based on the assessment of biology learning experts and material experts, the teaching module or PjBL learning device based on

the local potential of the Gandong River is worthy of being used as a learning device in biology learning on water pollution material. According to Rajabi et al. (2015) it is important to carry out an assessment of the feasibility of learning devices. Learning devices have valid criteria if the learning devices reflect consistency between the parts of the learning devices that are compiled and the suitability between learning objectives, learning materials and assessments that will be given. A similar opinion was also expressed by Doyan et al. (2020) that learning devices are said to be feasible if the indicators and learning objectives have consistency to be achieved. In addition to the consistency of objectives and indicators, a review of the consistent relationship of each component of the learning device developed with the characteristics of the applied learning model (Arbia et al., 2020).

In addition to the feasibility assessment, the assessment of learning devices was also carried out on practitioners, namely teachers and students. The results of the practicality assessment showed that the learning devices developed were practical as biology learning devices. According to experts, it is also important to carry out a practical assessment on practitioners. The practicality assessment on practitioners serves to determine the suitability of the product developed for use in the field. The practicality of the device is the ease of understanding and using the device (Rajabi et al., 2015). A developed device is declared practical if education experts and practitioners state in theory that the device can be implemented in the field and the level of implementation is in the good category (Sari, 2020). Arbia et al. (2020) conveyed that learning devices are said to be practical if the device is easy and can be implemented.

In general, the results of this study are in line with the results of previous studies, that the development of PjBL learning devices based on local potential is feasible and practical to be used as learning devices. Research by Khaerani et al. (2020) that the development of science learning devices based on local potential has met the valid category, the learning phases can be implemented well. Integration of local potential in science learning makes science learning more authentic and meaningful for students. Integration of local wisdom in science learning can provide insight for educators to instill local wisdom values in science learning. Local potential makes learning more authentic and meaningful for students. Similar research by Jufrida et al. (2022) that with the existence of local potential-based learning devices on sound wave material, it is feasible and practical to use in learning. With the involvement of local potential with the learning process in schools, students are not only able to understand the material well, but can also explore local potential in their area. Research results Sulistyowati et al. (2020) conveyed that the development of local potential-based learning devices is feasible and practical to increase students' awareness of the environment

It should be noted that the innovation emphasized in the development of learning devices for this independent curriculum is the integration of the local potential of the Gandong River. The Gandong River is the longest river in Magetan Regency. The integration of local potential in this learning is expected to make students more concerned and familiar with the potential of the surrounding environment and learning is more contextual because the objects involved in learning are objects that are familiar and close to students. According to Sugiyanto and Erviana (2022) the implementation of the independent learning program requires teachers to design contextual and meaningful learning to the Pancasila Student Profile standards. By internalizing local wisdom in every learning, students will always live and preserve the noble values that exist around them, especially in the school environment. All actions taken by students reflect the norms and character of the nation, and this is transmitted to the students they teach through the learning tools they create. Studying and strengthening local wisdom

values can build the character of the nation's children and develop a socio-religious life that contains values that are relevant and useful for society. Local wisdom values that have been embedded in the lives of the community can shape the character of the local community. Local wisdom that comes from natural resources, historical sites, community environments, and cultures that contain moral messages in shaping the character of the community (Mazid et al., 2020; Nabila et al., 2021; Nuraini. Latifa, 2018).

Apart from the research results obtained that the PjBL teaching module based on the local potential of the Gandong River is suitable for use as a learning tool and is practically applied in Biology learning, this teaching module has limitations. This research was conducted up to the development stage so that the product could still obtain feasible and practical results. According to Okpatrioka (2023) one requirement of learning products is that they are feasible, practical, and effective. Therefore, for further research, an effectiveness test can be carried out on this teaching module and applied to a broader school; if this study is applied at Senior High School 1 Barat, then it can be used in other Senior High Schools in the Magetan Regency. This aims to determine the effectiveness of this product on a large scale so that in the future, it can be used in biology learning.

## CONCLUSION

The results of the study indicate that the PjBL teaching module based on the local potential of the Gandong River, which was compiled, was declared feasible and practical as a learning tool for water pollution material for high school students in phase E or class X. The assessment of the feasibility of the teaching module was reviewed from the results of the evaluation of biology learning experts and material experts in the environmental field. In contrast, the results of the practicality assessment were carried out by practitioners, namely Biology Teachers and High School Students. Apart from the results of the study, the quality of the new learning device was reviewed from the results of feasibility and practicality. For future research, it can be reviewed through the effectiveness of the teaching module, and the local potential integrated in this study is the Gandong River. In fact, Magetan Regency has various representative local potentials as sources of biology learning; therefore, for further research, it can integrate local potentials other than the Gandong River.

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