Research Article

Validity Profile and Practically Biological Teaching Structures Based on Local Potenties BIOLA PJBL High Level and Enrichment Program

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Abstract.
Biology based on local potential Bioecology (BIOLA) PjBL High Level, is a promoter of a valid and practical enrichment program for SMAN pupils in Saparua Island. Products were developed in the form of RPPs, teaching materials, and Students Project Activity Sheets (LAPPD). This research includes a type of research and development that refers to a modified 4D development model that has three phases: (1) define, (2) design, and (3) develop. Research instruments use validation lifts and practicality lifts. Validation of learning instruments using a validation lift evaluated by four instruments expert validators consisting of two lecturers and two practitioners namely Biology subjects teachers. The practicality test of the learning instruments was evaluated using the response lift by the teacher and the pupil and the implementation of learning process by the teacher as an observer. The method used is descriptive statistics to obtain averages and percentages. The results of the validity analysis of the learning instruments using the Ideal Baku deviation (SBI), showing a rating of 3.93 with a very good category. Results of the analysis of implementation of the PJBL high level Biola instruments in the learning process by the observer and student responses in sequence showed 91% and 89.20% with the very practical category. So, it can be concluded that the BIOLA-PjBL High Level based biology learning instruments that has been developed is valid and practical for use as well as useful for teachers and pupils.

Keywords: Innovative teaching instruments, local potential, bioecology, PJBL High Level, enrichment program

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1. INTRODUCTION

The curriculum's existence emerges as one of the key elements in the field of education. Curriculum as an instrument for achieving learning objectives and serves as a guide for implementing instruction at all educational levels and kinds [1]. Local potential aspects that are present into the student's current environment have to be included in the instructional tool that the teacher has designed.

According to [2], courses were developed using national standards as a guide, with a principle of correction taken into account for educational units, the potential of the region, and the students. Instructors must continually incorporate the utilization of local potential into the learning process by modifying instructional tools. This helps students to see the potential of the environment as a resource for learning, preserve existing potential, and manage it sustainably for the benefit of the surrounding communities [3]. By using a potential-based teaching tool guide, it is anticipated that the incorporation of the area's local potential into the learning resource will help learners gain a deeper grasp of the subject matter and enable them to apply it to real-world situations [4, 5]. The term "local potential" in this study refers to all of local living organism which has been existed within an ecosystem and has been utilizated by local people in one area. In this study, Saparua island is one of coastal ecosystem with high local ecological potential which involves systemic interaction between human and the surrounding environment.

The study of plants and their surroundings has been recognized as bioecology. It consist of two main topics i.e biological and ecological. The features of morphology, anatomy, classification, reproduction, habitat and distribution, as well as the field's of ecological and financial advantages were covered by the field of biological studies. Whereas Ecology including the study of ecosystems, community organization, hazards to the forest, conservation initiatition, and environmental services were covered by the ecological studies. The study of bioecological's content could be arranged in such a way which suitable as a prerequisites for 10^{th} grade of biological material competency and also be incorporated into the biological teaching instrument as a supporting material for the enrichment program.

Biological teaching instrument based on bioecological local potential and project based learning in high level (Hereafter in this text it will be referred to as PjBL high level or BIOLA PjBL High level) will be developed, and will be incorporated particularly as an supporting material of the enrichment programs of Biological teaching. As a novel of learning support system, it consists of learning plan (*rencana pelaksanaan pembelajaran* or RPP), Student Project Activity Sheet or *Lembar Aktivitas Proyek Peserta Didik* (hereafter in this text will be refered as LAPPD), and artificial learning source that is made by the combination of bioecological content local potential, as well as PjBL High level model.

According to [6], the project-based learning model has several characteristics, including a problem that the learners will have to solve; the learners will cooperatively design and create their own work schedules as a way to solve problems; the activities will be evaluated in relation to the completed tasks and the final product of the tasks. PjBL

refers to an educational process that is evaluated through problem-solving exercises. Due to these all characteristics, the teaching process with this model gradually prepares students to build their own knowledge through collaborative learning. In addition, PjBL is a highly recommended teaching approach in the current Indonesian curriculum which is referred to as kurikulum merdeka.

The BIOLA PjBL High level model that have been developed in this study was based on the PjBL model as previous proposed by Lucas and Dopelt (DIKBUDRistek, 2014) with sligthly modification. The modification include the integration of technology pedagogical content (TPACK) and high-order thinking skills (HOTS) that applied during learning process. This model is expected to increase students capability and give them an opportunity to engage any investigation, assessment, interpretation, synthesis, and information gathering in order to generate a variety of learning outcomes based on research products. Hence, this research aims to reveal the validity and practicability of the BIOLA PjBL High level instruments as supporting devices and enrichment program of biological teaching.

2. METHOD

Thiagarajan, Semmel, and Semmel's 4-D developmental measurements were used in this developmental study adjusted in accordance with the researchers' requirements. According to the 4-D model, which stands for definition, planning, development, and diversification, the research is divided in four phases: "Define, Design, Develop, and Disseminate." However, the information distribution is restricted to the instruments's phase of development based on the requirements of this article.

The learning programmes described are the Learning Plan (RPP), the Learning Participant Project Activity Sheet (LAPPD), and the teaching material that has been validated by the learning experts and has been tested to the level of practicality.

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2.1. Analysis of Validity

The purpose of validation is to assess some good products that are used in research studies in order to produce accurate predictions or corrections. The products can be evaluated and the validator can provide commentary and advice, sometimes even critical analysis, based on the product's development results. The following are the steps involved in the SBI analysis procedure.

1. Calculate the average score for each aspect by using the correlation method.

$$\overline{X} = \frac{\sum X}{n}$$

In what place

$\overline{X}$ = Average score

$\sum X$ = quantity of points

n = number of validators

2. Convert score to scale 4

Adjust the score to a level of 4 by completing the following tasks:

1) Finding the optimal averages ($\overline{X_l}$) with similarity

$\overline{X_l} = \frac{1}{2}$ (Optimal lowest score + optimum highest score)

In what place,

Maximum ideal score = highest criterion element

Minimum ideal score = lowest criterion element

2) Using the formula to determine an ideal default brightness

$$SB_x = \frac{1}{6}(skormaksimumideal + skorminimumideal)$$

3. Establishing Evaluation Standards

Table 1 shows the evaluation parameters that were determined using the formula stated above.

TABLE 1: Category Criteria Scale 4 rating.

Qualitative Score Range	Category
$X \geq \overline{X} + 1.SBx$	Very high
$\overline{X} + 1.SBx > X \geq \overline{X}$	High
$\overline{X} > X \geq \overline{X} - 1.SBx$	Low
$X < \overline{X} - 1.SBx$	Very Low

2.2. Practicality Implementation Teaching

Analysis of implementation The observation sheet filling score provides insight into the learning instrument. The Interjudge Agreement (IJA) is then computed using the following equation to interpret the data:

$$IJA = \frac{A_Y}{A_Y + A_N} \times 100\%$$

description**:**

A_Y = Actions completed

A_N = incomplete task

3. RESULTS AND DISCUSSION

A high-level biology learning tool based on Biola PJBL that includes teaching materials, RPP, and LAPPD has been successfully built by this project.

3.1. Define Phase

Using a requirements analysis instrument distributed to ten instructors and forty students from each of the four Senior High School or *Sekolah Menengah Atas* (SMA) in Saparua i.e SMAN 7, SMAN 12, SMAN 41, and SMAN 42. Need analysis was conducted at the define phase of the development of learning instruments. Using a variety of possible resources, the analysis seeks to determine whether biology education as it exists now is contextually grounded.

The instructor is provided three lift indicators. Teaching resources on contextual biology, project-based enrichment programs, and the utilization of plants as biological learning source.

In general, teachers stated that biology learning materials were not contextual in terms of the availability of contextual biology learning indicators. They consider that preparing contextual learning instruments by utilizing local sources in nature requires a lot of attention and time. It is understandable why there are still many teachers who cannot complete the enrichment program instruments. On the other side, because it requires a lot of time and makes tired, project-based learning techniques are rarely implemented by teachers. Most teachers admit that they do not know about local potential, particulary to be integrated as a teaching tool. In addition to answering questions in the questionnaire, teachers and students were also interviewed with the result as follows:

a. Most members of the community, including teachers and students, are ignorant about the flowering plants that live and adapt to the marine coastal ecosystems and how they work as part of this educational process.

b. Moreover, based on these indicators, most of students told that the biological material that has been taught by teacher did not equipped with providing examples

Table 2: Requirements for the Biology Department Based on Local Potential of the BIOLA PjBL High Level.

No	Indicator	Questions	Answer Description
A. Responden Guru			
I	The biological material is contextual	How to centextualizied biological concepts by providing a comprehensive biology textbook	20% of respondents stated that their knowledge base was based on material that was based on general principles, whilst 80% stated that their knowledge base was not based on contextual material.
		How easy is it for students to understand the contents of the text books that currently used	The learning outcomes show that 40% of teachers are not able to understand their students, and 60% of teachers are able to understand their students. Due to the fact that most students have poor learning outcomes
		What content in a contemporary book is already contextual?	According to the respondent, the material in the current biology textbook is not contextual.The theory needs to be further adjusted to the current local potential.
		How can parents/guardians make learning materials more contextual and help students learn in their environment more easily?	100% of the teachers that are available are willing to share other examples that are easier to understand rather than to criticize.
II	Instructions for a project-based learning program	How many parents/guardians have created a study guide and used it to help students understand the material taught before becoming biology teachers?	Due to time constraints, not all teachers had finished creating the pedagogical aid to be used with their students.
		How well can students understand the past-made study materials?	The enrichment instruments have not been made by the teacher.
		How much have you used the project-based learning methodology before?	Because project-based learning requires a lot of time, 80% of teachers have never used it. Of them, 20% had already used it, but the execution was not very effective.
III	Fields as a resource of education	Do you know that the seagrass ia a native plant to the saparua island?	80% of teachers are unaware of seagrass as a local potential on the island of Saparua because they believe that lalamong and sea grass are the same. Because they frequently engage in bameti activities in what disciplines, just 20% of the teachers acknowledge that they are aware of it.
		Do you know the benefits of seagrass	only 10% of teachers knew about seagrass as an alternative food source, while the remaining 90% are not.
		Does your father or mother ever use a seagrass to teach biological concepts to young children?	The teacher has never used seagrass as a biological learning resource.

that are easy to look after in the environment and very difficult to understand. Due to the limited teaching materials and low learning literacy within community, teachers have not attempted to integrate the potential of local plants into biological learning

c. Preparing learning instruments takes a lot of time, this causes teachers to rarely implement project-based enrichment programs. or even though it is carried out routinely in the form of assignments to make material summaries, it is still not supported by designing and working on projects using these instruments.

d. Because it takes a lot of time to prepare the instruments, teachers seldom implement project-based enrichment programs. Even if enrichments are done routinely in the form of material summary tasks, it is not supported by projects designed in the tool.

e. Previously, enrichment programmes only accepted students with high academic achievements, while remedials were given to students with low academic accomplishments.

Only students in the higher academic group are eligible for the current enrichment program. Consequently, all students from both upper and lower academic groups should participate in the enrichment program by using the BIOLA PjBL high level. based on local-potency biological learning instruments. The goal is to increase students' competency of biological concepts, foster their capacity for original thought, and raise their level of environmental literacy.

Once the needs analysis is finished, the biology learning objectives then linearized using materials related to bioecology. Figure 1 illustrates the meaning of the linearity map.

The goal of biology learning spread and the bioecology content are linear, as seen in Figure 1. Beginning at the close of the 2022–2023 academic year, development for this study was limited to a few learning objectives. The two biological domains that inform these objectives are Plantae and Ecosystem & Environmental Change. Literary analyses are then conducted.

The study will concentrate on bioecological research and assess earlier results that bolster the creation of bioecological materials. Congenital theory, genetic theory, and the theory of learning are among the theoretical research that underpin the PJBL High-level model.

3.2. Phase of Planning (Design)

Following that, Biola-PJBL-based biological learning enrichment instrumsent were designed using literature reviews and field investigations. These instruments include

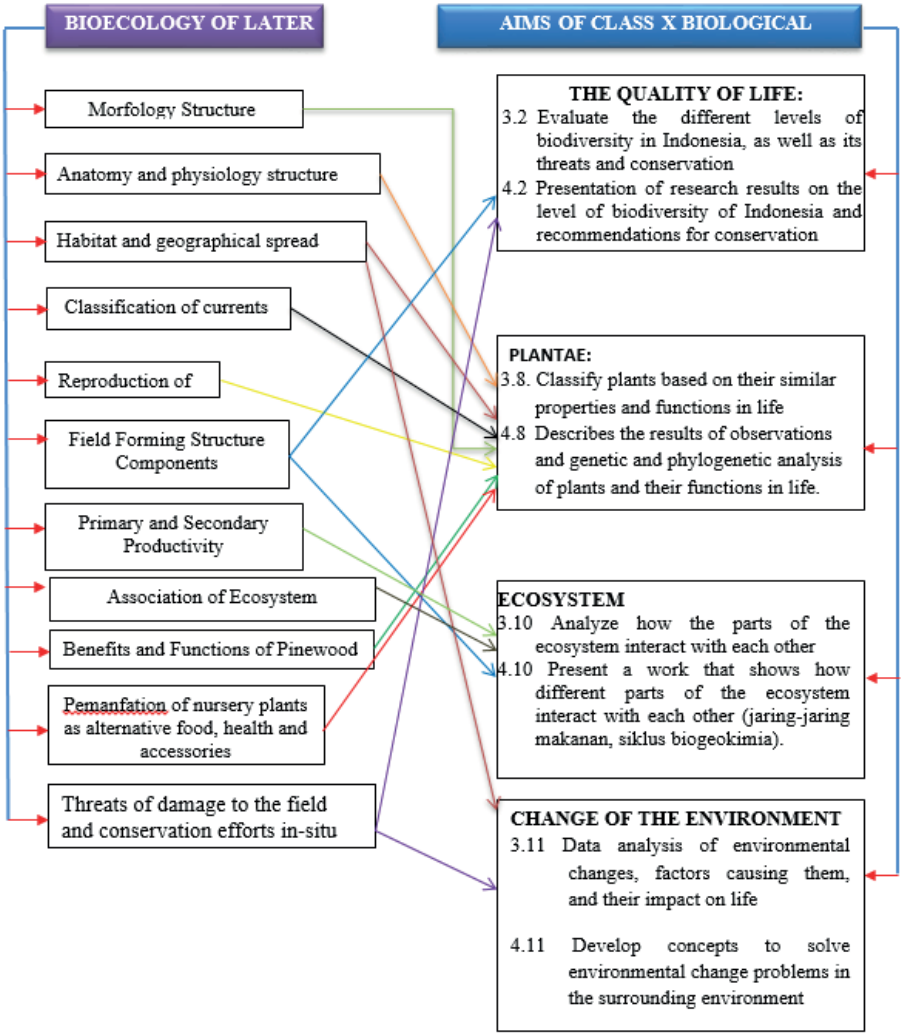

Figure 1: Depicts the linearization of the learning objectives for bioecology-related biology in the 10th grade Senior High School in Saparua.

RPP, LAPPD, and biological teaching materials that combine the bioecological contents of seagrass. The field media serves as a learning resource. Early prototypes are displayed in Prototype 1.

Based on the guidelines for the application of curricula in order to restore learning related to the learning and assessment guidance (Kemendikbudristek No. 262/M/2022), this RPP is made by adopting the principles of innovation to guarantee the learning standard of the enrichment program. Where researchers can determine learning activities and teaching instrumentss based on learning objectives, context of the educational unit, and characteristics of the student. It is in line with the Alsabilla 2023, which states that an independent curriculum allows educators to choose, create, use, and develop RPPs freely, but keeps attention to the three main components of RPP making: learning

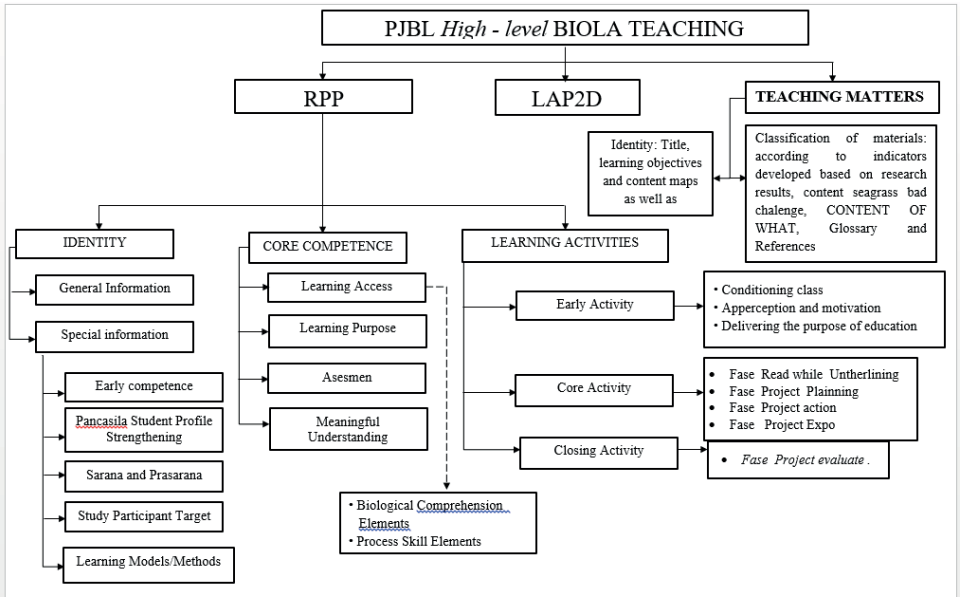

Figure 2: Design of the PJBL-High Level bioecology learning instruments to support the enrichment program.

objectives, learning activities, and evaluation. The learning steps in RPP are tailored to the high-level PjBL model syntax. This teaching module aims to enhance the creative skills and literacy of the student's environment. The identity of the teaching module, the purpose of learning (using the principles of ABCD, HOTS, and TPACK), the learning model, the means of learning, the learning activities (preliminary, core, and closing), and the evaluation are the main components of the modulus designed. The high-level PJBL model integrated in this learning instruments was adapted and adapted from Lucas and Dopelt 2005, and refers to the 2014 ministry of education and culture and kemendikbudristek 262/M/2022. Phase read while underlining (1) Phase project planing, (2) Phase project action, (4) Phase project expo (5), and (8) Phase project evaluate.

In addition, the preparation of the RPP is accompanied by the LAPPD, which is tailored to the principles of the high-level PjBL learning model and consists of identity, research information, research project activities, as well as working procedures, material instruments, data collection instruments, and work demonstration or product evaluation instruments. The development of teaching materials also takes into account the structure of science, 21st century skills in 4C, student potential, student development, relevance, usefulness, digital literacy (link voice tread), and life skills. By integrating the local potential of bioecology, the material is prioritized in biology learning. The teaching material covers factual, conceptual, procedural, and metacognitive aspects. accompanied by links to learning videos as well as SBC content (Seagrass Bed Chalengge).

"Now I Understand" has a record room where students can write their attitudes and understanding of the importance of preserving the fields.

3.3. Phase of Development (Develop)

Then, using RPP, LAPPD, and instructional materials, the learning tools then produced by combining the BIOLA PjBL high level. Table 3 provides an overview of the goods that come from the creation of biological learning instrumentss based on bioecology.

TABLE 3: Summary of Pjbl High-level Biology Learning Instruments Development to Support Enrichment Program.

Learning instruments	phase	Description	
TEACHING MODULES	**Identity**		
	General Information	**Phases, Classes, Semesters, Programs, Year of Study, Allocation of Time, Number of Meetings and Beneficiaries**	
	b.Special Information		
	Early competence	**Linearity of the scope of phase E biological material with bioecological content**	
	Pancasila Student Profile Strengthening	**Dimensions**	**Element**
		Believing, fearful of the Lord, and worthy of worship.	Morality to nature
		It's critical.	Making decisions thinking and reflecting thoughts.
		Creative	have the ability to consider alternative solutions to problems
	Facilities	Laptops or computers, internet networks, educational materials on bio-ecology, writing instruments, and field environments as natural laboratories, etc.	
	Study Participant Target	Students of 10^{th} Grade	
	Model/Method of learning used	PJBL high-level discussion and answering methods, field research	
	II.Core Component		
		Biological Understanding	Students can create solutions to problems related to understanding the diversity of native plants and their roles, ecosystem components and intercomponent interactions, as well as environmental changes in native native areas in coastal waters of Saparua Island.
		Process skills	Throughout the planning, implementation, and project output, students make connectiona between what they already know and what they already learned about, particularly related to bioecology. They also consider the linguistic usage, scientific standart and concept, as they related to a specific study settings

TABLE 3: Contniued.

Learning instruments	phase	Description	
	a.Learning access	**Element**	**Learning Access**
	b.Learning Purpose	Adjusted to the scope of the Subject and the Purpose of Learning	
	c.Asesmen	1. Creative thinking skills assessment instrument 2. Environmental Literacy Skills Assessment instrument 3. Pancasila student profile character assessment section	
	D.meaningful understanding	Information about the benefits that students will gain after learning about bioecology. These advantages they can use in everyday life to help preserve the in-situ watches.	
	III.learning activities		
	Early Activity	**Teacher Activity**	**Student activities**
		- Conditioning class and customization - Apperceptions and motivation (presenting vidio representations related to the contents of the plant) - Delivering the purpose of reproduction	-Reflecting and responding to the teacher's activities - focus on the object
	Core Activity		
	Fase Read while Underlining	-Dividing students into different groups - Providing bioecology tutorials to students in the form of manual and digital documents -Motivating students to undertake independent literacy activities outside the classroom and completing a SOME understanding test independently or in groups.	- Dividing students into different groups - Providing bioecology tutorials to students in the form of manual and digital documents - Motivating students to undertake independent literacy activities outside the classroom and completing a SOME understanding test independently or in groups.
	Project Plainning Phase	Students are mapped based on the learning interests of each group Instructs students to compile research projects using bioecology materials for the field and the field as a learning resource:Determining project problems with students and making LAPDs with them In collaboration with the students, the teacher sets the end date of the research-based project.	Investigate using pictures, videos, and reading objects to foster critical and creative thinking in the form of hypotheses. Design the project in the form of LAPD, including choosing the way to complete the project, assembling the material instruments, observation instrument work steps, and product creation. Create the project timeline with the teacher. Each group studies the steps of the research project according to LAPPD needs.
	Fase **Project action**	*Provides guidance and guidance for students' research projects, as well as motivates and encourages them to create research products based on differentiation. Evaluates and revises products if necessary.*	Develop creative ways to solve project problems Conducting research in accordance with the LAPPD and within the specified time limits. create a product that is relevant to the project problem (poster, artikel, video, makanan dan minuman, dll.) Modify products when needed

Table 3: Contniued.

Learning instruments	phase	Description	
	Fase project Expo	Provides a thesis-based learning reception on the theme "Maintaining the fields as local natural resource sites on Saparua Island." Monitoring the degree of action and the work of the pupils	In exhibition activities, students create products and communicate them through the degree work action.
	Closing Activity		
	Fase project evaluate	Resume: Teachers help students draw conclusions about learning experiences and instill positive habits about the importance of preserving the field as a local natural resource site.	To preserve the field as a local resource site, he must share his knowledge, perspectives, and skills.
		Reflection: Give the student the opportunity to reflect on the enrichment learning program.	Fill reflection sheet
		Provides assessments intended to evaluate the creative skills and literacy of the student environment.	Participate in the assessment of critical thinking skills and environmental literacy provided by teachers
LAPPD	**Identity**	Information on research purposes, titles, instruments and materials, working procedures, instructions for observation and sampling, and instruments for product evaluation	
Teaching Materials	**Identity**	Title, learning objectives, indicators and content maps	
	Matter Reproduction	Classification of material based on indicators developed based on research results, content of bad chalenge seagrass, contents of WHAT, glossaries, and references	

Prior to field trials, the product (prototype II) was validated by four experts comprises of two lecturers and two practitioners who are senior teacher. Documents containing biological material and instruments were sent to the validator to be validated as part of the validation procedure. The purpose of the validation is to offer suggestions, critiques, and advice for the learning instruments product that has been created. Each lift includes a score, a remark with numerous suggestions for enhancements, and a marker designating the part of the learning instruments that may require repair in order to assess the learning instruments development product. The Validator uses the Ideal Balance deviation was used by the validator to examine the validation findings (Table 4).

The four professional validators have validated the learning instruments and found five components in the validation results: Self-Instruction, Self-Contained, Stand Alone, Adaptive, and User-Friendly. Table 4 displays the findings of the validation test conducted on the developed Bioecology PjBL-High Level local-based biological learning enrichment instrumentss. High-level learning instruments have all the qualities of a good learning instruments, and the content they offer satisfies exceptional standards; validators rate them as excellent, giving them an average rating of 3,198.

Table 4: Validation Results of Learning Instruments.

Validation Results of Learning Instruments	Aspects	Xi/ X	Sbi	X	Category
	Self Instruction	2.5	0.5	3.45	Valid
	Self Contained	2.5	0.5	3.04	Valid
	Stand Alone	2.5	0.5	3	Valid
	Adaptive	2.5	0.5	3.25	Valid
	User Friendly	2.5	0.5	3.25	Valid
Average				3.198	Valid

3.4. Revision of Product

A record of validation outcomes accompanied by subsequent improvement records is analyzed in order to improve learning and assessment instruments prior to deployment in learning. Table 5 provides an overview of the learning instrumentss' improved results.

After the instrument has been evaluated and repaired, it is then validated by the validator who is an expert for the validating. The validation results are shown in Table 6.

Table 6 displays the result of validation of learning instruments of Biola High level PjBL based on the local bioecology. The average of validator is about 3,93 which is categorized in to valid category. As a result, the educational resources developed are already deserving of being employed in the enrichment program's learning process. Validity is composed of appropriateness, relevance, utility, originality, practicality, and suitability, among other elements [7].

3.5. Field Trial

After the validation of the PjBL high-level Biola learning instruments, the next step is a field trial to examine the effectiveness of learning process with the PjBL high level Biola teaching instruments. 7 state senior high school, 12 state senior high school, and 42 state senior high school are located near to the coastal area of Saparua Island. These schools are targeted of interest for the implementation of the design and development of validated instruments, and the research sample consists of 8 (eight) teachers as observers and 90 X-grade students for the academic year 2022/2023.

Table 5: Revision Results of BIOLA PjBL High Level Learning Instruments.

No	Instruments	Before Revision	After the revision
1	Teaching module	The read while Underlining stage should be included in the initial introductory activities	The Underlining read stage has been included in the initial introductory activities
		Students need to be organized on the basis of their interests.	It has been included in the phase of organizing student groups based on their interests
		Need to include time at each stage of the learning activity	Time has been included for each stage of learning activities
		It is necessary to include reflective instruments of pupils and teachers at the closing activities.	A reflection instrument has been done by students and teachers at the closing activities.
		Need to include LAPD identity	The LAPD's identity has been added in the title of project activity, class, learning program Enrichment, time and location.
		The names and identities of group members have not been included	The names and identities of group members have been included
		The is replaced with research information according to the title of the LAPD activity	The has been replaced with research information according to the LAPD activity title
		There is no instance format for the evaluation of work demonstration or product creation activity	There is already an instance format for evaluating work or product demonstration activity
		There is No. confirmation evaluation format for Pancasila student profiles	The Pancasila student profile improvement assessment format has been included
2	Teaching Materials	It is necessary to include the objectives and indicators of learning on the identities of the teaching material.	It has been added on the identity of the teaching material
		Supplied with the latest Reference List	Has been completed with the latest Reference List
		glossary is needed	Glossary already exists
3.	Assessment instrument	We have to consider the importance of the issue and adjust our approach to the subject's level of expertise.	Questions have been adapted to meet the level of competence.

Practicality analysis data obtained from the lifting response through the observation of teachers and pupils. with the result is shown in Table 7 and 8.

Theoretically, based on the validator's evaluation results, Biola PJBL's high-level learning model as a supporter of enrichment programmes is considered worthy to be used in the classroom. Empirically, the learning instruments in the field test meets very

Table 6: Validation Results of Learning Instruments.

Validation Results of Learning instruments	Aspect	Xi/ X □	Sbi	X	Category
	Self Instruction	2.5	0.5	3.9	Valid
	Self Contained	2.5	0.5	4	Valid.
	Stand Alone	2.5	0.5	3.75	Valid.
	Adaptive	2.5	0.5	4	Valid.
	User Friendly	2.5	0.5	4	Valid.
Average				3.93	Valid.

Table 7: Results of Data Analysis of Implementation of High-Level PJBL Biola.

Teacher's response		
Laernig instruments	**Presentase**	**Category**
Teaching module	88%	Very practical
Educational material	92.40%	Very practical
LAPD	92.70%	Very practical
Average Total	**91%**	**Very practical**

Table 8: Results of Data Analysis Students' Responses to the Application of PJBL High-Level Biola Learning instruments.

Students' Response		
Laernig instruments	**Presentase**	**Category**
RPP	88.80%	Very practical
Educational material	89%	Very practical
LAPD	90%	Very practical
Average Presentation	**89.20%**	**Very practical**

practical criteria with some technical recommendations on time efficiency, according to the results observed by teachers and students.

The practicality test results shown in Tables 7 and 8 showed that educators' responses to the implementation of learning instruments reached 88% of presentations, 92.40% of teaching materials, and 92.70% of LAPPD, with an average score of all instrumentss of 91% with the category Very Practical. Furthermore, the respondents of learners shown in Table 8 indicated RPP presentations of 88.80%, teaching material of 92,40%, and LappD of 92.7%. Thus the instrumentss developed have qualified practically based on teacher and student response data. In addition to this, an analysis of the practical aspects of implementation by the teacher as an observer is carried out.

Data on the implementation of learning is obtained from the observation sheet by the observer. The data is shown in Figure 3.

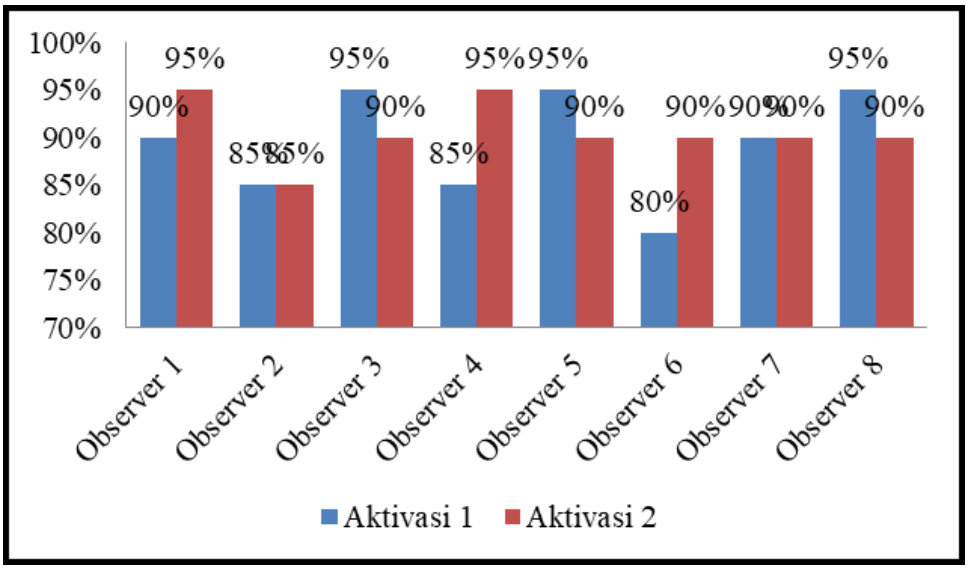

Figure 3: Results of Learning Implementation Assessment.

According to Figure 3, the learning instrumentss developed meet validation standards and are very practical to apply in learning, especially in enrichment programs. The results showed that the average implementation of the learning phase after validation, revision, and application was between 85 and 95 percent in the highly practical category.

It suggests that Biola PJBL's high-level local potential-based biology learning instruments can help teachers in enrichment programs. This learning tool has many advantages, such as the design of bioecology material that integrates the concepts of biology, ecosystem material and environmental change, as well as the scope of the material of biodiversity and its functions for human life. The material has video information about bioeconomics, pictures and information about research, seagrass based challenge (SBC) content linked to the LAPPD, and the content as a way for students to reflect on what they have learned about bio-ecology.

In the reading phase while emphasizing, the teacher directs the student to undertake independent literacy related to the bioecology material of the Guru outside the classroom. They were also asked to consider their reflections on WHAT material, underlining or underlining what material was considered relevant, and answer questions about WHAT materials individually or in groups. At this stage, students solve practical issues. It helps them simplify and summarize the information they have learned and link it to real-world situations, as well as packaging it into the final task project. The easiest way for students to do it is to strip the bottom of the reading; this is because students are already interacting indirectly with the reading material [8] gives an explanation that untherlining

is an activity that involves the selection of important concepts during reading. Obviously, this activity can reveal the learners' understanding and help them find more important information during literacy. Besides, it helps students learn on their own self and focus on more important things.The field as a learning resource helps students formulate problems and solve them through research projects. This is in line with the statement by Zakirman and Rahayu in 2018 that effective communication between teachers and students will appear in better student learning outcomes.

The next phase is project plaining, project action, project expo which refers to the LAPPD. Where at this stage the students are very enthusiastic in exploring the understanding of the concept and curiosity through the discussion of the preparation of the project, field observation up to the stage of the manufacture of products such as articles, posters, leafleats and other products related to food, vegetable beverages and is displayed at the school expo activities that involve all school citizens and other stacholder in this case the heads of schools and teachers intergenerational SD, SMP and high school who are in the region of Saparua Island, the corvillas, the community and the figures of the Church. It is carried out as a form of campaign in focusing coastal communities to preserve the lake as a site of local natural resources that can be used as a source of learning and the well-being of peasant communities.

The development's outcomes are consistent with earlier studies that created and used PJBL learning instruments for a variety of learning contexts, including math. [6, 9, 10], science literacy [11], English [12], and vocational learning [13]. In theory, the use of a instruments in conjunction with the Project Based Learning (PjBL) approach can enhance students' diverse skill sets and be a valuable tool for learning. According to [12] research, students who use the PjBL-based for learning exhibit strong motivation and proficient opinion presentation. In this work, the Project Based Learning approach is used to construct learning by including local potential components of bioecology. (PjBL). Its goal is to make it simple for pupils to connect the lessons they are learning with the real world.

According to [13], teachers ought to set up the instructional materials before the class begins. Teachers focus on signs of learning achievement found in learning. Additionally, educational help teachers become more professional, act as indicators, and enhance learning. Furthermore, [13] and [14] clarify that, in practice, teachers hardly ever create educational resources or instrumentss; instead, they merely impart knowledge that has already been presented in textbooks, and students merely listen to and take notes on what their teachers say. As a result, the teacher dominates classroom activities.

By integrating the high-level bioecological content of the PJBL into the biology lessons, it will be able to create variation in learning and make learning more meaningful by promoting the fields as a source of learning and as a conservation target, which in turn will result in an improvement in the economy and well-being of coastal communities.

4. DISCUSSION

Based on the information gathered from the observation leaflet and interviews with biology teachers, it was discovered that while new schools have started to use independent curriculum as a model for implementing learning, there are still certain challenges and inadequacies with them. It is challenging for teachers to create instructional materials that have the local capacity to carry out high-quality learning in compliance with the independent curriculum's requirements. Among the possible natural resources in the area are the fields, which might serve as educational resources. [13] It explains why before beginning instruction in the classroom, teachers should set up the educational technology. Teachers focus on markers of learning achievement found in the learning. In addition, educational technology pushes boundaries, enhances instructor professionalism, and provides hints for better learning. Further, [13] and [14] stated statement, the teacher is very strict about the curriculum and learning materials and only assigns material that has already been covered in textbooks. Students are only allowed to read and copy the teacher's explanations, thus the teacher controls all of the class activities.

Furthermore, due to time constraints, teachers hardly ever conduct enrichment activities or even set up their. Teachers have been using project-based learning (PjBL), problem-based learning (PBL), and discovery learning in conjunction with the use of innovative learning models in the learning process. However, the implementation of these models has not strictly adhered to the learning process's design, and teachers continue to have a dominant role in the learning process.This suggests that the teacher is not providing students with a varied and relevant learning experience, which results in low student participation in the teaching process.

According to [15], effective education models can increase students' motivation and make them more actively involved in their studies, resulting in optimal learning outcomes. In relation to the teacher-student learning process, the prior learning strategy should be taken into consideration. Within the curriculum, teachers are given the opportunity to enhance learning activities through the use of teaching aids. The results of the observations show that the teaching instruments designed by the teacher already contains three components of the independent teaching module of the curriculum

including general information, core components, and attachments, but on the part of the core component have not been completed reflection sheets of teachers and pupils, formative assessment kits, glossaries, and lists of libraries that are still few as well as teaching materials that are not systematically assembled and have not connected local natural resources so that they can not be used by pupils specifically in learning. Furthermore, the documentation of the teacher-developed enrichment program was not discovered by the researchers.even if it is limited to assigning pupils with advanced academic skills homework.

The learning instruments used in this study are RPP, LAPPD, and Seagrass Bioecology, which is relevant to biological content. This includes the following phases: : (1) *Phase define*; (2) *Phase of Planning*; (3) *Phase of development*; and (4) *Revision of product*. (5) *Field trial*. This is expected to be an innovative solution for teachers to create engaging lessons for students, especially in the context of a study program.

The produced instruments are legitimate and useful, demonstrating that they satisfy the needs of an independent curriculum that encompasses evaluations, core activities, learning objectives, and learning access. Based on empirical observations of the school's learning process, it can be observed that teachers and students with high levels of intelligence can easily be included in the learning process by using the high-level BIOLA PJBL instruments. The students were very enthusiastic in the learning phases by using the PJBL high level model. They also demonstrated critical thinking skills and creativity in creating collaborative products such as leaflet posters and other products made from leftover materials, such as food and drink ingredients. Apart from that, the students demonstrate their communication skills in showcasing the finished products to every participant at the exhibition that was held during the peer education session.

It is expected that the Biola PJBL high level teaching instruments can be utilized by instructors and trainees in carrying out the teaching program. Learning process is potential to increase students' reactivity in class and teach them how to effectively handle real-world situations by using project-based learning methods.

5. CONCLUSIONS

Based on research and development results, it can be concluded that the biological teaching materials based on local BIOLA PJBL high level potential are highly suitable and useful for use by instructors and students in 10^{th} grade Senior High School in Saparua island. The validation results obtained from 4 experts on learning instruments, consisting of 2 lecturer and 2 senior teacher, are 3.93 with a very good category. On

the other hand, the practical results of 8 teachers were scored 91%, and 90 students were scored 89.20% with each category being very practical.

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