Development of e-Module for Pancasila Student Profile Strengthening Project Phase E with Sustainable Lifestyle Theme Eco-Enzyme Making Topic

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***Abstract*—This research is a research and development of an e-module for the Pancasila student profile strengthening project phase E on the sustainable lifestyle theme, Eco-enzyme making topic. The purpose of this study was to determine the feasibility of the P5 e-module in terms of media experts and material experts. To assess students' response to the e-module and the development of students after using the P5 e-module. This electronic module uses the ADDIE development model. The subjects in this study were 12 students of class XB for small group trials, and 30 students of class XA for large group trials. The results of the study showed that the P5 E-module that had been developed had a feasibility level in the very feasible category with a score of 95.7 which met four aspects, namely the appearance aspect, content aspect, language aspect, and usage aspect. The developed e-module also received a good response from students 85.7 with three aspects presentation and appearance, content aspect, and usage aspect. Based on the interpretation of the dimension assessment criteria, the P5 value in class XA of SMA Negeri 1 Kota Bengkulu is in the very developed criteria after using the developed P5 e-module. This means that the developed E-module of the Pancasila student Profile strengthening project is good for use in P5 activities.**

***Keywords*—electronic module, project learning model, Pancasila student profile strengthening project**

I. Introduction

The independent curriculum is a curriculum that aims to develop character through the concept of the Pancasila Student Profile. This is realized through learning in schools including face-to-face learning (intracurricular), extracurricular and co-curricular based on projects [1]. The fundamental difference in the independent curriculum is the existence of project-based cocurricular learning to strengthen the character of the Pancasila Student Profile and soft skills. This learning is called the Pancasila student Profile strengthening project or can be called P5. Through P5, students are encouraged to contribute to their surroundings, become lifelong learners, competent, and intelligent, and have character by the Pancasila student Profile. A sustainable lifestyle is one of the crucial themes amidst global challenges related to the environmental crisis and climate change. Realizing the importance of environmental education, a project-based approach in the education curriculum is expected to encourage students to be actively involved in environmental conservation efforts.

Another characteristic of the Independent Curriculum is implementing Project Based Learning (PjBL) to support character development through the Pancasila Student Profile. The implementation of the independent curriculum requires the creation or implementation of projects carried out by students. These project activities enable students to be able to develop their potential and skills in many areas. One of the project activities in this independent curriculum is the implementation of P5 activities (Pancasila student profile strengthening projects) [2]. P5 activities can be carried out at the conceptual and contextual stages. The activities in P5 will later act as a form of implementing the independent curriculum which can provide a much more meaningful learning process and experience for students. This is because, in practice, students must be trained in discussing and making an item or event regarding the project and can train students in solving their problems so that they achieve much better results. The purpose of P5 is to develop students' skills in creating projects that are tailored to the Profile of Pancasila students [3]. In phase E of the Pancasila Student Profile Strengthening Project, students are invited to develop understanding and skills related to sustainable living, one of which is through the creation of eco-enzymes. Eco-enzymes are an environmentally friendly solution that can be used as a cleaner, organic waste decomposer, or natural fertilizer. The process of making eco-enzymes is simple, cheap, and sustainable, and can utilize leftover materials from daily activities, making it very relevant to the concept of waste reduction and waste management.

Based on observations at SMAN 1 Bengkulu City, researchers found several shortcomings in the implementation of the Pancasila student profile strengthening project.

Teachers have difficulty implementing the independent curriculum due to a lack of information about P5 and a lack of learning tools such as teaching modules and project modules needed to support learning. However, teachers continue to try to face these challenges by learning together about the independent curriculum. One of the problems faced is the lack of project modules that are by the theme and the difficulty in compiling the right project modules. In addition to problems with teaching tools, educators also have difficulty determining topics that are suitable for P5 activities. It was found from the results of observations that the character of Pancasila values possessed by students has decreased, such as lack of concern for the surrounding environment, lack of tolerance, and cooperation between friends. One effort to overcome this is to create and develop an e-module for the Pancasila student Profile strengthening

project. The purpose of creating this e-module is to serve as a guide for implementing P5 activities in schools, starting from planning, project achievements, project implementation, and evaluation. E-modules are more practical teaching materials because they can be used anywhere and anytime by students via smartphones, the presentation is more interesting, and interactive videos and animations can be included [4–7].

A sustainable lifestyle refers to a lifestyle that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. The concept emerged in response to the increasing environmental crises, such as climate change, pollution, and ecosystem degradation, caused by unsustainable human activities. With rapid population growth and urbanization, the consumption of natural resources has also increased. This phenomenon has led to the overexploitation of nature, which has exacerbated the degradation of the planet. Therefore, sustainable lifestyles involve changes in the way we consume, produce, and manage resources, as well as encouraging the use of renewable energy, waste reduction, and more efficient consumption patterns. The basic principles of sustainable lifestyles include reducing carbon emissions, managing waste responsibly, using local and environmentally friendly products, and preserving biodiversity. With the increasing global awareness of the importance of sustainability, sustainable lifestyles have become not only a choice but also a necessity to maintain the balance of nature and ensure the quality of life for future generations. P5 with the theme of a sustainable lifestyle is one way to teach Pancasila to students. A sustainable lifestyle is not only useful for creating a healthy and sustainable environment, but can also be used as a means of instructing Pancasila values such as cooperation, mutual respect, and social responsibility. Schools have a role as institutions for instilling values in students. Therefore, the creation of this e-module is very important as an effort to guide schools in implementing P5, especially on the topic of sustainable lifestyle according to the challenges of the times and the student needs.

Higher education institutions have an important role in city development towards sustainable development, so FKIP as a partner of schools is also obliged to foster schools to implement this concept [8]. This cannot be separated from the role of students as the younger generation who are involved in school projects related to environmental conservation [9].

This E-Module is designed to provide students with an understanding of the importance of an environmentally friendly lifestyle through a project involving the creation of eco-enzymes. Through this module, students not only learn theoretically but can also practically apply their knowledge in everyday life. This project is expected to shape the character of students who are environmentally aware, develop critical and creative thinking skills, and can work together to achieve common goals for the sustainability of the planet. Thus, the development of this E-Module supports the national education goal of producing students who are noble, critical, independent, and responsible for creating a better and more sustainable world. The urgency of this research is that for teachers, e-modules can be used as additional teaching material references in the implementation of the Pancasila student profile strengthening project, especially in chemistry and sustainable lifestyle themes, as well as a tool to support learning improvement. For students, it can be a teaching material that can be easily accessed and used, and make students interested in studying chemistry and increasing their creativity. The development of e-modules begins with the stages of analysis, design, development, and implementation, which are systematically arranged to solve learning problems related to student needs and characteristics. The ADDIE model provides an opportunity to evaluate development activities at each stage, which has a positive impact on the quality of development products.

Based on the description, education must be managed more optimally by providing the widest possible space for community participation as part of the goals and content of education. As an implication, education becomes a collaborative effort that involves the participation and role of the surrounding environment in it. Participation in this context is in the form of cooperation between residents and the government in planning, implementing, maintaining, and developing educational activities in schools, one of which is the Pancasila student Profile strengthening project with the theme of sustainable lifestyle. This study aims to develop an interactive and contextually relevant e-module to support the Pancasila Student Profile in Project Phase E, focusing on the theme of sustainable lifestyle with an emphasis on eco-enzyme production. This e-module is intended to enhance students' environmental awareness, critical thinking, and practical sustainability skills. Guided by the ADDIE (Analysis, Design, Development, Implementation, Evaluation) instructional design model, this study explores how effective e-modules can be developed and integrated into project-based learning to promote sustainable behavior in learners. Specifically, this study aims to answer the following questions: in the Analysis Phase, what are the learning needs, challenges, student and teacher needs analysis, and conceptual analysis of teaching materials related to the integration of eco-enzyme production in the Pancasila Student Profile project. In the Design Phase, the content, structure, and learning activities of the e-module are designed to align with the objectives of the Pancasila Student Profile and the theme of sustainable lifestyle accompanied by effective learning strategies and supported by digital features that are able to encourage student engagement. In the Development Phase, the e-module is reviewed in detail, explaining how digital tools and multimedia resources can be utilized in developing an interactive and pedagogically sound e-module on eco-enzyme production. Technical and content challenges that emerged during the e-module development process are addressed, along with the methods used to overcome them. In the Implementation Phase, the e-module is implemented in the classroom, and students respond to the implemented e-module. In the Evaluation Phase, the e-module is reviewed in detail, explaining how effective the e-module is in improving students' understanding, skills, and attitudes regarding sustainable lifestyles through eco-enzyme production. It also examines feedback provided by students and teachers regarding the usefulness and relevance of the e-module in learning.

II. Literature Review

The Pancasila student profile strengthening project module is a document containing the planning of Pancasila student

profile strengthening project activities that are by certain themes and phases. This module contains objectives, steps, media and assessments to implement a Pancasila student profile strengthening project. [10]. The module is designed in the form of activities that can be completed within a specified time so that students can achieve their goals [11]. E-module is an individual learning strategy implemented in electronic form and consists of lesson plans, teaching materials, and homework assignments that are completed methodically to achieve the expected level of competency [12]. The preparation of the P5 module is prepared by a team of facilitators according to the level of readiness of the Education Unit with the following general stages: Determining sub-elements (project objectives); Developing project topics, courses and duration, and; Developing project activities and assessments. Education Units and educators can develop the Pancasila student profile project module according to the learning needs of students and modify the module [10]. Educational units and educators can develop Pancasila student profile project modules according to student learning needs and modify the modules.

Project-based learning is a project-based learning model where students face real problems that are considered relevant and then work together to create solutions to these problems [13]. This project-based learning focuses on active learning where students explore questions or tasks, make plans, evaluate solutions, and produce ideas that are poured into the work. In general, according to Fathurrohman [14], the steps of project-based learning are Project determination, Planning project completion steps, Preparation of project implementation schedule, Project completion with facilitation and monitoring from teachers, Preparation of reports and presentations or publication of project results and Evaluation of the project process and results. Canva is a free design application that can be easily used to create designs with professional results using design templates [15]. Canva can be easily used via a browser or accessed via a smartphone or laptop, where Canva is equipped with features that make the design process easier, such as text, animation and video features that are already available, so that it can attract people to use the application [16].

III. Materials and Methods

This research was conducted in the period of March-June 2024 at one of the high schools in Bengkulu City, Indonesia Class X. The trial subjects were determined using a purposive sampling technique. In this study, the subjects were selected based on the considerations of the P5 coordinator teacher at SMA Negeri 1 Bengkulu City. The subjects in this study were 12 class XB students for the small group trial, and 31 class XA students for the large group trial.

This research uses the Research and Development (R&D) research method, according to Sugiyono [17]. Research and Development R&D is a research method used to produce new products and then test the effectiveness of the product. This study uses the ADDIE model which stands for Analyze, Design, Development, Implementation, Evaluation. This model was chosen because the ADDIE model is often used by researchers in product development and has been proven to produce good products. The resulting product is in the form of a project e-module that can be useful for teachers in training students' conceptual understanding. The ADDIE development model has stages in its development, namely: 1) analysis phase, 2) initial product design or planning phase, 3) product development phase, 4) product implementation phase, 5) product evaluation phase [18].

A. Analysis

The analysis stage aims to determine the need for the development of an e-module for the Pancasila student profile development project in Phase E. This stage is carried out by identifying the needs required in the learning process, especially in the use of teaching materials by providing a needs questionnaire to students and conducting interviews with teachers. The questionnaire distributed to students and teachers has been validated by experts. This preliminary study is expected to obtain several aspects of needs, namely:

1) Needs analysis

The needs analysis aims to identify and identify the needs of students' teaching materials and the problems that occur during the learning process in P5 activities with the theme of sustainable lifestyle. The results of field observations at SMAN 1 Kota Bengkulu show that there is still a lack of teaching materials in the form of P5 modules that are in accordance with the Independent Curriculum. So this is an obstacle for the school. The use of technology in this school is still minimal and the school has not fully implemented the use of e-modules in learning. Teachers have difficulty implementing the Independent Curriculum and P5 activities. Therefore, it is necessary to develop an e-module for learning projects.

2) Student analysis

At this stage, student analysis is carried out to obtain information regarding student characteristics, learning styles and learning interests of students.

3) Concept analysis

This analysis was conducted with the aim of identifying important elements in the development of the project module for strengthening the profile of Pancasila students phase E on the theme of sustainable lifestyle in the Bengkulu region, this analysis is very important to ensure that all relevant aspects have been covered.

B. Design Stage

After the analysis stage is carried out, the next stage is the design of the product to be developed. Developers need to design products according to what has been researched. In this development, developers use the Canva Design application to design products. The reason for using Canva Design is because Canva Design is a well-known and easy-to-use graphic design platform. This platform is very suitable for teachers and instructors who want to create graphic designs quickly and easily without having to have in-depth skills in the field of graphic design. Canva Design provides various design templates, such as templates for teaching materials, so that users can choose templates that suit their needs. Not only that, Canva Design also provides various design elements, such as photos, icons, and fonts, which can be used to make beautiful teaching material designs. The activities that will be carried out in this study are as follows:

1) Preparing various references in the form of books and

journals related to the Independent Curriculum in P5 activities, sustainable lifestyle themes and eco-enzyme soap topics.

2) Compiling e-module content such as supporting videos, explanations of activity flows, and evaluations.
3) Preparation of the draft module design, the module draft consists of several parts as follows:

1) Cover 2) Foreword 3) Drafting team 4) List of contents 5) Instructions for use 6) Main course 7) Module Profile 8) Introduction 9) Dimensions, Elements, Sub elements and targets 10) Activity 1 Problem Introduction 11) Activity Task 1 12) Student Worksheet 13) Activity 2 Creating a Project Planning Design 14) Worksheet 15) Activity 3 Project Schedule Preparation 16) Worksheet 17) Activity 4 Project Design Investigation 18) Proposal assessment rubric 19) Proposal assessment 20) Activity 5 Project implementation & monitoring 21) Project journal 22) Final report assessment rubric 23) Dimension assessment rubric 24) Activity 6 exhibition of works 25) Project Assessment 26) Activity 7 evaluation 27) Activity 8 reflection 28) Student Self-Reflection 29) Student Follow-up Plan 30) Facilitator Follow-up Plan 31) Reference

C. Development Stage

The development stage is a process of realizing a previously designed product design plan. At this stage, the researcher uses the Heyzine Flipbooks application, the reason for using this application is because the Heyzine Flipbooks application has complete features and this application is easier to use and has been widely used by researchers who use this application in developing. The product design that has been conceptualized is then developed with the following steps:

1) Creating a P5 e-module in the form of a link

At this stage, the e-module of the Pancasila student profile strengthening project is made according to the HTML format using the help of the heyzine flipbooks application. The final result of the e-module that has been developed is in the form of a link. And the final result is in PDF format to be accessed offline via smartphones and laptops.

2) Expert Validation

The process of validating the module to experts by filling out a product assessment questionnaire that includes several aspects and their respective indicators. The module must be declared feasible and valid by the expert before being implemented in learning activities. Data from the results of the expert evaluation are then analyzed to determine the level of validity of the module. Revisions are made based on input and suggestions from material experts and media experts. After writing the module draft, the next stage is editing the module draft. This stage consists of editing and assessment activities carried out by a team of experts. The modules that have been prepared are then consulted periodically and continued with an assessment by a team of experts. The aspects seen and assessed by the team of experts are competence, content quality, completeness of module components, suitability of the Pancasila student profile strengthening project module with the implementation of the Independent Curriculum, presentation, and design.

3) Phase I Revision

The first stage of revision is the process of improving the e-module based on the editing results, the researcher makes revisions according to the module's shortcomings. After the module is declared feasible, the module manuscript processing or production process is carried out.

4) Product Trial

The revised e-module in stage I was then tested. The product trial was conducted on class XB students of SMAN 1 Kota Bengkulu. The purpose of the product trial was to determine the response of students, as well as to obtain suggestions and input related to the developed e-module.

5) Phase II Revision

After the product trial was conducted, suggestions and input were obtained from students. These suggestions and input were used as guidelines for making improvements to the developed e-module.

D. Implementation Stage

At this implementation stage, the P5 e-module was tested on a small scale and a large scale on a small scale to find out how students responded to the developed project e-module. This trial was conducted on 34 class XB students of SMA Negeri 1 Kota Bengkulu in May 2024. The selection of this class was based on the consideration of the coordinating teacher of the Pancasila student profile strengthening project. The purpose of this phase is the effective and efficient delivery of instruction through the e-module created.

E. Evaluation Stage

This stage measures the effectiveness and efficiency of instruction. Evaluation should truly occur throughout the process from analysis, design, development and implementation in the classroom.

Data analysis techniques are carried out qualitatively and quantitatively. Qualitative data consists of suggestions or input on the validation sheet by experts and student response questionnaires. The data is analyzed descriptively qualitatively and used as a reference for revising the developed e-module.

1) Product validation results analysis

The assessment scale used in the product validation instrument is a Likert scale. The Likert scale consists of very feasible, feasible, quite feasible, less feasible, and not feasible. For quantitative analysis purposes, the Likert scale data can be scored [19]. The Likert scale data scores are in accordance with the provisions in Table 1 below.

Table 1. Likert scale data for product validation

Scale	Score
Very worthy	5
Worthy	4
Quite decent	3
Not worthy	2
Not feasible	1

Calculate the percentage of relative frequency with the following formula:

$$V = \frac{\sum x}{Smax} \times 100\%$$

Information:
V = Percentage of validity
$\sum x$ = Total value obtained

Smax= Total ideal value

Product validity criteria according to Hariono [19] can be seen in Table 2.

Table 2. Validity criteria based on the values obtained

Percentage	Category
81%–100%	Very Valid
61%–80%	Valid
41%–60%	Quite Valid
21%–40%	Less Valid
0%–20%	Invalid

Based on the validity criteria table in Table 2, the e-module of the Pancasila student profile strengthening project Phase E on the theme of local wisdom in the Bengkulu region can be said to be feasible if the product validity percentage reaches ≥ 60%.

2) Analysis of student response results

The assessment scale used in the product validation instrument is a Likert scale. The Likert scale consists of strongly agree, agree, less agree, disagree, and strongly disagree. For quantitative analysis purposes, the Likert scale data can be scored. The Likert scale data score is in accordance with the provisions in Table 3 below.

Table 3. Likert scale validation [20]

Score	Evaluation
5	Very good
4	Good
3	Pretty good
2	Not good
1	Very Bad

The first stage in the analysis is to calculate the student response score using the following formula:

$$R = \frac{\sum x}{N}$$

Information:

R: Average score of students

$\sum x$: Total score of student responses

N: Number of questions

The average percentage of the project e-module assessment is determined using the formula:

$$V = \frac{\sum x}{Smax} \times 100\%$$

Information:

V: Percentage of student responses

$\sum x$: Total score obtained

Smax: Maximum score

The percentage obtained is then changed into an assessment statement to determine the feasibility of the e-module that has been created by adjusting it to Table 4.

Table 4. Student response percentage assessment scale [19]

Percentage (%)	Category
1–20	Very Bad
21–40	Not good
41–60	Pretty good
61–80	Good
81–100	Very good

IV. Results and Discussion

This study uses the ADDIE development model, therefore the stages in the product development process that will be produced include analyze, design, develop, implement, and evaluate. However, because this study has limited time, this study is limited only to student responses so that the application or implementation stage is not carried out. This study only consists of ADDIE, namely analyze, design, develop, implementation and evaluation. The research procedure used in this study is in accordance with the ADDIE development model described by Tegeh [21] are as follows:

A. Analysis

The analysis stage aims to determine the need for the development of an e-module for the Pancasila student profile development project in Phase E. This stage is carried out by identifying the needs required in the learning process, especially in the use of teaching materials by providing a needs questionnaire to students and conducting interviews with teachers. This preliminary study is expected to obtain several aspects of needs, namely:

1) Initial analysis

In the initial analysis, an analysis was carried out on the conditions and availability of learning devices available at the school. Based on the results of interviews in January 2024 with the P5 coordinator teacher at SMA Negeri 1 Bengkulu City, several problems were found in the Pancasila student profile strengthening activities where teachers still had difficulty implementing the independent curriculum and the lack of teaching materials in the form of P5 modules that were in accordance with the independent curriculum. Teachers stated that they experienced obstacles with the current teaching materials which were still relatively limited. The use of technology is also still very minimal in the learning process, then the lack of teacher experience with the concept of the independent curriculum, limited references so that teachers still use the lecture method so that learning tends to be monotonous [22]. The results of field observations at school also showed that there was still a lack of teaching materials in the form of P5 modules that were in accordance with the Independent Curriculum. So that this is an obstacle for the school. The use of technology in this school is still minimal and the school has not fully implemented the use of e-modules in learning.

Problems in the existing learning process indicate that improvements need to be made. Efforts to overcome these problems are by developing teaching materials in the form of P5 modules. This is also in line with input given by teachers that there needs to be easy-to-use, free and innovative learning media so that students do not get bored easily in the learning process.

2) Student analysis

Student analysis aims to understand their learning characteristics, including group work, learning styles, and learning interests. In the Pancasila Student Profile Strengthening Project (P5) activities, this analysis helps understand how students interact, learn, and develop through projects that strengthen Pancasila values.

There are significant differences between the implementation of the 2013 Curriculum and the Independent Curriculum. The Independent Curriculum focuses more on students, making them feel more comfortable compared to the

complicated workload in the 2013 Curriculum. In the Independent Curriculum, the role of teachers is more as a learning supporter, helping students achieve educational goals. Ki Hadjar Dewantara's view also supports this concept, emphasizing the importance of involving students in interactions with their environment to increase awareness, sensitivity, and problem-solving skills [23]. The problem-solving approach in the Independent Curriculum is carried out through group work based on certain topics. This collaborative learning involves several individuals working together to achieve goals. The active participation of each group member is considered important for the success of learning, and individual success reflects the success of the group [24].

From the analysis of student involvement in group projects, differences in their characteristics are visible. Some students actively participate in discussions, provide ideas, solutions, and show high responsibility and initiative. However, there are also students who contribute less, are less responsible, and do not have good initiative. Based on the results of the analysis of student needs distributed online using Google Form, it is known that students have different learning styles and interests. There are students with visual, audio, and kinesthetic learning styles. According to Kurniawan [25], visual learning style means that students prefer to process information through sight, auditory style is to prefer information through hearing, and kinesthetic learning style is to prefer information through movement, practice or touch. The results of this analysis also show that 82.9% of students want electronic learning materials that are equipped with text, images and videos so that they can meet their learning style and are more interesting and follow technological developments.

Based on the distribution of the questionnaire, it is known that 94.3% of students often use smartphones during activities and during the learning process if permitted by the teacher. Students also stated that they were interested in electronic modules. This is a consideration in developing teaching materials in the form of e-modules for waste processing-based projects that can be accessed via students' smartphones. This e-module is designed by utilizing technology that is familiar to students, so it is expected to increase student interest and involvement in the learning process.

3) Concept analysis

Concept analysis was conducted with the aim of identifying important elements in the development of the Pancasila student profile strengthening project module phase E on the theme of sustainable lifestyle. The Pancasila Student Profile Strengthening Project (P5) is an integral part of the Merdeka Curriculum which aims to form a student profile with character in accordance with Pancasila values.

Concept analysis is conducted to identify the main concept, pour it into a hierarchy and also arrange the steps taken rationally. Based on the results of interviews with teachers, it is known that in the design and implementation of P5 activities, 3 themes were chosen from 7 themes offered for one year. The seven themes are: 1) Sustainable lifestyle, 2) Local wisdom, 3) Entrepreneurship, 4) Bhinneka Tunggal Ika, 5) Build the soul and body, 6) Voice of democracy, and 7) Engineering and technology to build the Republic of Indonesia. The selection of themes is based on the readiness of the school such as the assets owned by the school and the conditions and needs of students. The theme that is the topic of attention is the theme of sustainable lifestyle which aims to build students' awareness to act and behave in an environmentally friendly manner, as well as seek solutions to environmental problems [26].

The Pancasila Student Profile is a form of the goal of improving the quality of education in Indonesia in the form of strengthening character in accordance with the values of Pancasila. The Pancasila Student Profile has 6 characters, namely: (1) faithful, devoted to God Almighty and has noble morals, (2) working together, (3) independent, (4) globally diverse, (5) critical thinking and (6) creative [27].

The learning objectives of P5 activities are adjusted to the dimensions, elements, sub-elements and phase achievements that are adjusted to the abilities of the students. Learning objectives are also adjusted to the theme raised and adjusted to the selected topic/issue. The Independent Curriculum does not require teachers and students to achieve all aspects of the dimensions in one theme, teachers can focus on only 3 dimensions because the main objective in P5 activities is to achieve the Pancasila student profile. However, teachers are expected to be able to innovate in designing project implementation, so that students can feel happy and comfortable when the Pancasila student profile strengthening project activities take place [28]. The process of determining the topic requires mature time so that new ideas emerge and project activities can proceed as planned.

Based on this, it is necessary to develop teaching materials that offer several dimensions and design systematic learning steps that can later be used by teachers and students in realizing the values of Pancasila in everyday life. Based on this analysis, a project e-module was developed that not only provides theoretical information but also practical steps. In particular, the e-module with the theme of sustainable lifestyle raises the topic of waste management, where waste is very close to the environment of students. It is hoped that the development of this e-module will help students apply the knowledge they gain directly through real projects and develop skills and foster character values contained in Pancasila.

The evaluation conducted at the analysis stage, namely, the researcher conducted the analysis only at one school, namely SMA Negeri 1 Kota Bengkulu, so that the problems analyzed were only the problems observed at the school. Therefore, more comprehensive research is needed to find the relationship between the problems and the products developed through analysis in several schools.

B. Design

The design stage includes several planning stages for developing teaching modules by designing several of them, such as designing teaching module components, compiling teaching module materials, and designing instruments.

1) Design of teaching module components

The design stage means determining the components of the teaching module to be developed. The initial stage is determining the cover, table of contents, module usage instructions and main menu. Furthermore, the General Information section contains the module identity.

Furthermore, the core components include Introduction, Dimensions, Elements, Sub-elements and Target achievements, learning scenarios and their syntax, trigger questions, etc. and the final part of the teaching module is the references and author biodata. So that the prototype results at this design stage produce an initial design for the e-module components of the Pancasila Student Profile Strengthening Project Phase E on the Theme of Sustainable Lifestyle, namely: (1) Cover, (2) general information, (3) core components, (4) Closing Components. Fig. 1 and Fig. 2 is an example of an e-module design, a product produced in this research:

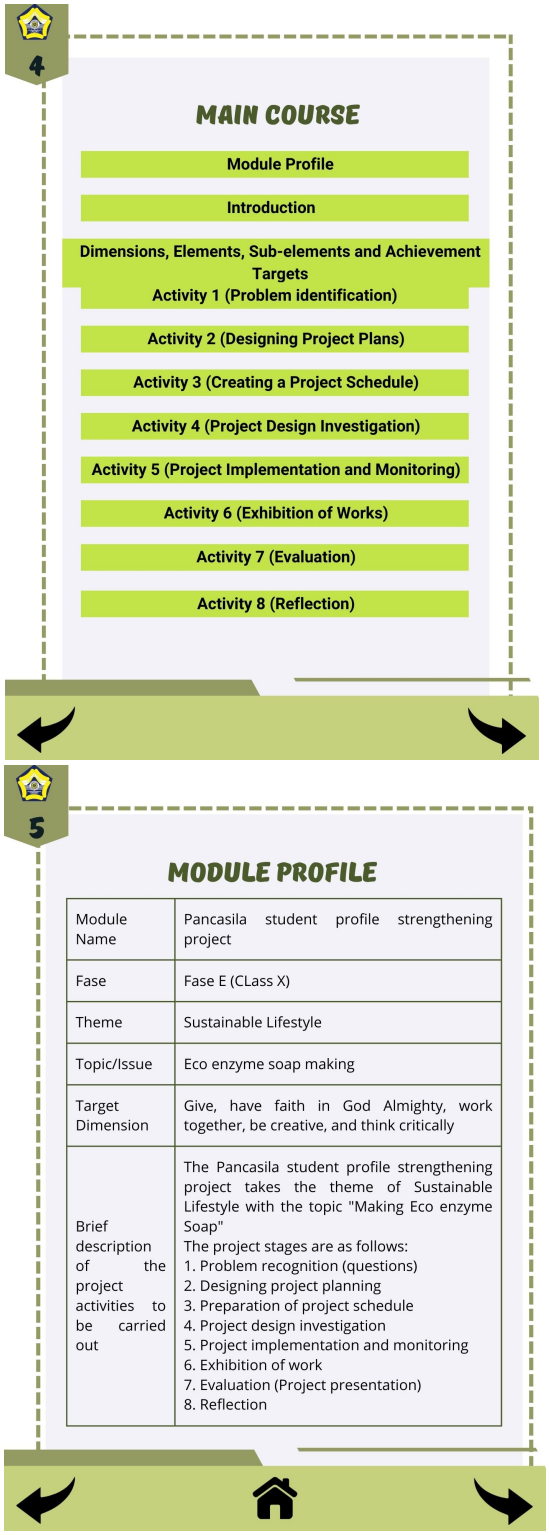

Fig. 1. Main menu e-module and module profile.

Fig. 2. E-module worksheet and exhibition of work results.

2) *Preparation of teaching module materials*

The main focus at this stage, the researcher designed the teaching module is to design and determine the appearance of the cover and also the contents of the teaching module to be developed and create activities that match the theme of the teaching module. The teaching module was designed using the Canva design application and the change in the form of

the module into an e-module using the help of the Heyzine Flipbooks application. This flipbooks application can be flipped like a real book [29]. The way researchers create teaching modules includes paying attention to:

1) Cover

The initial stage carried out by researchers in making the cover is to explore various shapes, colors, and also take pictures of eco-enzyme soap. This is done with the aim that the appearance of the module cover can look more attractive and the selected image can describe the topic/issue of the activity that will be carried out in the project.

2) List of contents

The table of contents provides information about the titles contained in the e-module and the page locations where these sections can be found.

3) Instructions for use

In the user manual, the author provides information containing information on how to operate the e-module, not only how to operate it, but the user manual displays three button icons that can be used to operate the e-module.

4) Main course

In the main menu, the information displayed is similar to the table of contents. However, the difference is that in this main menu there are no page numbers. This main menu will later function as a home page, where each menu can be clicked and will take the user to the appropriate page.

5) Module Profile

In the module profile section, the author provides some information contained in this project e-module, including the name of the module, activity theme, phase, topic/issue, target dimensions and a brief description of the activity idea to be carried out.

6) Dimensions, elements, sub-elements and target achievements

Dimensions are aspects or large categories of competencies that students want to achieve. Dimension determination is done by looking at the P5 development guide and then developed through discussions with experts to be adjusted based on the identification of the main objectives (themes). Elements are more specific components in each dimension. Elements are determined based on previously determined dimensions. Sub-elements are more detailed parts of elements that describe more specific abilities or knowledge. Each element is divided into smaller and more specific sub-elements.

Achievement targets are expected results or standards that must be achieved by students at the end of the learning process. The steps taken in determining achievement targets are first conducting an initial assessment to understand the level of student ability, based on the results of the initial assessment and curriculum standards, setting realistic and challenging achievement targets. Ensuring achievement targets are specific, measurable, achievable, relevant, and time-bound (SMART principle).

7) Activity

The determination of project activities is determined based on the themes and topics raised. In the e-module of the Pancasila student profile strengthening project Phase E on the theme of sustainable lifestyle, the author determines activities following the PJBL syntax.

8) Assessment Rubric

In this project e-module, there are 4 assessment rubrics, including the proposal assessment rubric, the final report assessment rubric, the presentation assessment rubric and the last is the dimension assessment rubric.

3) Instrument design

After deciding to create and design a teaching module, the researcher began to design the instrument. This instrument design includes interview instruments, expert validation sheets and student response questionnaires.

The evaluation carried out at the design stage, namely at this stage, the researcher designs the teaching module by designing and determining the appearance of the cover, and also the contents of the teaching module to be developed, and creating activities that match the theme of the teaching module. Considerations in choosing an application for e-module design must be considered so that the research does not experience obstacles. The canva application is the choice because it is easy to use, easy to access, and has many features. In this study, the transformation of the module into an e-module used the help of the Heyzine Flipbooks application.

C. Development

1) Product development

The development stage is a process of realizing a previously designed product design plan. At this stage, the researcher uses the heyzine flipbooks application, the reason for using this application is because the heyzine flipbooks application has complete features and this application is easier to use and has been widely used by researchers who use this application in developing. At this stage, the e-module of the Pancasila student profile strengthening project is made according to the HTML format using the help of the heyzine flipbooks application. The final result of the e-module that has been developed is in the form of a link. And the final result is in PDF format to be accessed offline via smartphones and laptops.

2) Product validation

The process of validating the module to experts by filling out a product assessment questionnaire that includes several aspects and their respective indicators. The module must be declared feasible and valid by the expert before being implemented in learning activities. Data from the results of the expert evaluation are then analyzed to determine the level of validity of the module. Revisions are made based on input and suggestions from material experts and media experts. After writing the module draft, the next stage is editing the module draft. This stage consists of editing and assessment activities carried out by a team of experts. The modules that have been prepared are then consulted periodically and continued with an assessment by a team of experts. The aspects seen and assessed by the team of experts are competence, content quality, completeness of module components, suitability of the Pancasila student profile strengthening project module with the implementation of the Merdeka curriculum, presentation, and design. The media validation data are presented in Table 5 below:

Based on Table 5, it is known that the average score of the assessment of the three aspects of product feasibility, namely the appearance, content, language and use aspects carried out by the validator team is 95.7. Based on the validity criteria in

Table 5, the e-module developed according to the material expert is included in the very feasible category. The description of each aspect assessed in the validation aspect is as follows.

Table 5. Validation results

Assessment aspects	Score				Category
	V1	V2	V3	Average	
Display Aspect	96	96	96	96	Very worthy
Aspen Contents	100	100	100	100	Very worthy
Language Aspects	100	87	93	93.3	Very worthy
Usage Aspects	100	100	80	93.3	Very worthy
Average			95.7		Very Worth It

1) Display aspect

The validation score on the appearance aspect is 96% with a very feasible category. The high score results on the appearance and presentation aspects indicate that the cover layout is appropriate for the e-module. The cover components are the author's name, identity logo (Tut Wuri Handayani logo, Bengkulu University logo, and Bengkulu City 1 State High School logo), images related to the contents of the e-module, and the target users of the e-module are for phase E or class X.

The e-module presented uses 3 color combinations, namely green, yellow and white. The use of these colors is not excessive so that readers can still focus on the content presented in the e-module. Other components in the e-module are in accordance with *background,* images, and navigation. However, on the other hand, based on the validation results on the shapes, there are still shortcomings, namely based on the analysis there are still shapes with inappropriate sizes that can distract the reader's focus so that improvements need to be made.

The type of font used in the e-module is open sans for the contents of the module and bree serif for the page and title. The use of this font is not excessive and the size is appropriate so that it is easy to read. The choice of color in the writing is also right with a color that contrasts with the background and does not use a shadow so that it is easy to read. According to Zhafirah [30]. A good e-module is an e-module that uses a type and size of font that is easy to read, an attractive cover display, and the images and videos presented can be observed clearly so that they are easy for teachers and students to understand.

2) Content aspect

The validation score on the content aspect is 100% with a very feasible category. The high score on this content aspect shows that the topic presented in the e-module in the form of waste processing is in accordance with the theme, namely a sustainable lifestyle. The completeness of the content presented in the e-module is good by presenting images, videos and concrete steps in each activity. Then the dimensions presented contain 6 dimensions that can be selected by teachers according to the conditions of the school and students. The six dimensions are: 1) Faith and devotion to God Almighty, 2) Mutual cooperation, 3) Independence, 4) Global diversity, 5) Critical thinking, and 6) Creative [27].

The elements and sub-elements presented are appropriate based on the references of the six dimensions and topics of waste management raised with the theme of sustainable lifestyle in the developed e-module. The learning objectives or achievement targets presented in the e-module are in accordance with the phase achievements, in this e-module the phase to be achieved is phase E or class X. The PjBL learning flow is appropriate with the activities carried out also by displaying each syntax in the activity. The stages in project-based learning in the e-module are as follows:

a) Determining basic questions, in this first stage students are directed to conduct observations related to problems in the surrounding environment, students are also asked to work on initial assessments related to waste that are carried out with group members. The purpose of this stage is to build student awareness regarding the surrounding environment and problems in the surrounding environment, especially on the problem of organic waste around schools and homes.
b) Making a design, at this stage students are asked to make a design or solution related to the problems that have been found in the field. At this stage students are also directed to be creative and think critically in its implementation.
c) Making a schedule, at this stage students are asked to make a project implementation schedule into an implementation schedule table, then determine the target to be achieved. At this stage students are also directed to divide tasks to each group member and help each other in each stage. Students are also asked to prepare and submit a report on the activity plan that has been designed.
d) Monitoring project progress, at this stage students are asked to complete the project that has been designed so that the target that has been determined at the beginning can be achieved. In this activity, the role of the teacher as a facilitator to motivate students and guide students in carrying out the project is also inseparable. Teachers can also assess the character of students at each stage carried out.
e) Result assessment, this stage is carried out at the end of the P5 activity which is usually called a work exhibition, this activity can be done independently or in groups with several other classes. Teachers or facilitators can provide assessments and input from the beginning of planning, implementation and also results.
f) Evaluation, at the project evaluation stage, students and teachers reflect on the P5 activities that have been carried out, and can also design a follow-up plan for the future to be more optimal.

3) Presentation & Language Aspects

The validation score on the language aspect is 93.3% with a very feasible category. The high results on the usage aspect indicate that the developed e-module has accuracy in selecting sentences and appropriate language in accordance with the General Guidelines for Indonesian Spelling (PUEBI), the language used is simple, easy to understand and does not cause double meanings and is communicative. Language criteria, language requirements and the use of appropriate and correct terms and symbols so that the message to be conveyed can be understood well by the reader and does not cause misinterpretation [31]. The linguistic aspect category is classified as very feasible, although there is one that is not perfect. This shows that in the linguistic aspect, the e-module still has several shortcomings. Based on the analysis conducted by the researcher and the validator's input, there are words and sentences that must be corrected, such as errors in spelling words.

4) Usage Aspects

The validation score on the usage aspect is 93.3% with a very feasible category. The high score on the usage aspect shows that the use of e-modules during the learning process in the classroom is effective and efficient. This is because the developed e-modules are useful for students, are not difficult to operate because there are instructions for use and appropriate navigation, namely the next page, previous, home, and hyperlink buttons that are easy to operate.

The developed e-module does not require large storage because it can be accessed online via a link so that it does not complicate students in the learning process using the e-module. However, the layout of the link on the e-module is too close, causing errors in accessing, so it is necessary to make improvements to the layout. The e-module can also be accessed using various devices, both smartphones and laptops.

The average score obtained overall is included in the very feasible category. This shows that the product developed is feasible, which according to the e-module validator can be tested on students. Based on the results obtained, the e-module is feasible because it has met the 4 aspects assessed, namely appearance, content, language and usability, but at the validation stage there were several suggestions and input from the validator which were used as a reference for the revision of stage I.

3) Phase I revision

Based on the validation results of the e-module of the Pancasila student profile strengthening project that has been validated by experts, it is known that the developed e-module obtained a score of 95.7% with a very feasible category. At this revision stage, there were suggestions and input from the validator so that a revision was needed. The suggestions and input that have been given became a reference in the revision stage I. The revision I from the validator can be seen in Table 6.

Table 6. List of validator revisions

Before Revision	Follow-up
There are errors in writing words that do not comply with PUEBI	Correction of writing with the correct words according to PUEBI
Some points in the e-module assessment rubric are not precise	Improvements to the assessment rubric by adding a presentation assessment rubric
Lack of videos on soap making, especially detergent, dish soap, and bath soap	Improved by adding some soap making videos
The use of the image of trash on the cover is not clear and is too small.	Improvements to the image on the cover

Based on Table 6 above, improvements have been made as suggested by the validator so that the developed project e-module can be tested on students.

The evaluation conducted at the development stage, namely the developed e-module product has been evaluated through validation by media experts and material experts and tested on small groups to obtain student responses. The validation results from the media expert and material expert team stated that the developed product was very feasible to be tested with several revisions because several shortcomings were found. The researcher has corrected input from the validator. The researcher conducted revision based on input from the validator to improve the product so that the quality of the product produced would be better.

D. Implementation

The implementation stage is applying the e-module project in class based on the expected learning objectives. At this stage, trials are conducted on small and large classes to determine student responses to the designed e-module. This trial aims to obtain student responses to the developed e-module. The results of this trial will be used to make product improvements. The results of the student response test are presented in Table 7.

Table 7. Student response test results data

Aspect	Score (%)	Category
Presentation and display aspects	85.5	Very good
Content Aspect	85.1	Very good
Usage Aspects	86.5	Very good
Average score	85.7	Very good

Based on Table 7, it can be seen that the average score of student responses to the e-module of the Pancasila student profile strengthening project consisting of 3 aspects, namely presentation and appearance, content aspects and usage aspects is 85.7%. Based on the category of student responses, the student responses to the developed e-module are included in the very good category. The aspects assessed in student responses are as follows.

1) Presentation and display aspects

The score of the presentation and display aspect in the student's response got a score of 85.5% with a very good category. This high score result shows that according to students, the appearance of all e-modules makes them interested in using e-modules in P5 activities, the language used is easy for students to understand and does not cause misinterpretation, the type of font used is not boring and clear to read because the size is not too small and a clear color combination using 3 color combinations, namely red, cream and dark blue so that it is easy to read and supported by the images presented in the e-module so that it is not boring when reading the project e-module. According to Zhafirah [30], a good e-module is an e-module that uses a type and size of font that is easy to read, an attractive cover display, and the images and videos presented can be observed clearly so that they are easy for teachers and students to understand.

According to Kosasih [32], a good learning e-module has several characteristics, namely adaptive and user friendly. Adaptive means that the learning e-module is designed with the development of science and technology. An e-module can be said to be adaptive if the e-module is in accordance with the development of science and technology and is flexible to use. User friendly means that the e-module should be familiar or friendly to its users. Every instruction and explanation contained in the e-module is intended to help its users. A user friendly e-module uses simple and easy to understand language.

2) Content aspect

The content aspect score on the student's response got a score of 85.1% with a very good category. This high score

result shows that students can independently understand the topics contained in the e-module, the videos displayed also make it easier for students to plan projects and foster creativity and care for the surrounding environment. The explanation given about sustainable lifestyles makes it easier for students to understand the objectives of the theme.

The processing topics presented in the e-module can make it easier for students to build awareness to care about the surrounding environment. In addition, it also trains critical thinking related to problems in the environment, builds discipline and self-control in students. The topics presented also enable students to express their thoughts in the form of works and train and build creativity levels.

3) Usage aspects

The score of the usage aspect in this trial got a score of 86.5% with a very good category. The high score results in this usage aspect indicate that the developed e-module is useful for students, namely it can make it easier for students to carry out projects and be more independent in the learning process. This is in accordance with Padwa's opinion [33] which states that teaching materials that use e-modules will direct students to carry out more independent learning and help students in the learning process, because e-modules can be interpreted as a tool in the learning process that is packaged in the form of visualization.

Based on the results of student responses to the e-module of the Pancasila student profile strengthening project that was developed, it was very good because according to students, the e-module that was developed could foster students' awareness of the surrounding environment, could train critical thinking and develop creativity, could facilitate students regarding the theme of sustainable lifestyles and this project e-module was also interesting for students. However, there were suggestions and input from students, namely errors in the navigation buttons so that revisions needed to be made again.

Based on the results of the responses of class XB students of SMA Negeri 1 Kota Bengkulu to the e-module of the Pancasila student profile strengthening project, the score was 85.7% with a very good category. These results indicate that the e-module is suitable for use, but still needs improvement according to the suggestions and input of students, namely the color of the main menu is too bright so that when students want to access the menu it is not clearly visible and less attractive, so improvements are made by changing the color of the main menu which was originally white and yellow to green.

Next, a large-scale trial was conducted on students. The trial consisted of 30 students of class XA Phase E of SMA Negeri 1 Kota Bengkulu. In the implementation of the trial of the P5 e-module product with the topic of making soap from eco-enzymes, it was given in the form of a link that can be accessed by students using a cellphone/smartphone or computer. Then the researcher explained the use of the project e-module that had been distributed to students and the students operated the developed e-module. The following are the results obtained by students after using the P5 e-module. The results obtained based on the targets achieved by students based on the previously determined dimensions are presented in Table 8.

Based on Table 8, it can be seen that the results of the observation of the P5 assessment of students obtained an average score of 3.5. Based on the interpretation of the dimension assessment criteria, the P5 value in class XA of SMA Negeri 1 Kota Bengkulu is in the very developed criteria. The following is a description of the data from the observation of the P5 dimension assessment of students. From Table 8, student assessments are obtained from the results of observations and project assignment reports given to students.

Table 8. Assessment results

Dimensional Assessment Aspects	Mark	Category
Mutual cooperation, collaboration, cooperation	3.4	Developing as expected
Critical thinking, acquiring and processing ideas, identifying, clarifying, and processing information and ideas	3.7	Very developed
Creative, producing original works and actions	3.4	Developing as expected
Average	3.5	

The first dimension in the developed module is mutual cooperation with the collaboration element with the cooperation sub-element getting a score of 3.4 which is in the developing category according to expectations. In this eco-enzyme soap making project, students work together with other students and can align actions in groups to create harmony and achieve common goals. The achievement of this dimension can be seen in activity 1 where students are asked to work on group worksheets and activity 3 to design the division of tasks for each member. The results of this dimension are that students have the ability to work together to foster a mindset that working together can make a job easier and faster, and instill an attitude of mutual respect and appreciation for differences of opinion between individuals. This is in accordance with research conducted by Kharisma [34], where mutual cooperation is a sensitivity that stems from self-awareness, this awareness arises from a sense of compassion for one person towards another.

The second dimension is critical thinking, with elements of obtaining and processing information and ideas, and its sub-elements identifying, classifying, and managing information and ideas with a score of 3.7 which is in the highly developed category. The results of this dimension are that students can explore information about the theme and topic of making soap from eco-enzymes. Exploring information is not only by receiving but also managing the information obtained. The achievement of this dimension can be seen in activity 1 with the stage of determining the project to be implemented. In this activity, the teacher gives students assignments to examine and finally solve the problems faced. This project makes students active in critical reasoning by providing their opinions and ideas. Having critical reasoning skills enables students to identify and solve problems well so that they are able to make the right decisions [35].

The third dimension in the e-module is creative, with elements of producing original ideas and producing original

works with a score of 3.4 which is in the category of developing according to expectations. The results obtained by students are able to find original creative ideas from their thoughts related to the eco enzyme soap making project. The achievement of this dimension can be seen in activity 2 where students are able to design the design of the project they are doing. The many ideas submitted by students make the achievement of this creative dimension increasingly visible, although there are still some students who do not play an active role.

The evaluation conducted at the implementation stage, namely after validation and revision, the developed e-module product was tested on a small group consisting of 12 XB students of SMAN 1 Kota Bengkulu. The results obtained were in the form of a very good response to the developed e-module. In addition, students also provided some suggestions and input to improve non-functioning navigation and typos. These suggestions and input were used as a reference by researchers to conduct product evaluation and the revision phase II so that the developed e-module product had even better quality.

V. Conclusion

Based on the results of the research that has been carried out, the following conclusions were obtained, the developed e-module obtained a feasibility score of 95.7 by fulfilling four aspects, namely the appearance aspect, content aspect, discussion aspect and usage aspect. The students' response to the developed e-module received a good response from students of 85.7 by fulfilling three aspects, namely the presentation and display aspect, the content aspect and the usage aspect. After using the e-module in the P5 process, it was found that the P5 score of class XA of SMA Negeri 1 Bengkulu City was in the very developed criteria with an average of 3.5 on a scale of 4, meaning that students' abilities in carrying out the project of making soap from eco enzymes developed very well.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

All authors conducted the research, wrote the paper, analyzed the data, revised and edited the paper; all authors had approved the final version.

References

[1] N. Solikhah and A. Wahyuni, "Problem analysis of the independent learning curriculum implementation," *Pendas J. Ilm. Pendidik. Dasar*, vol. 8, no. 02, pp. 4627–4630, 2023. doi: 10.35568/naturalistic.v7i2.2203

[2] L. N. Kholidah, I. Winaryo, and Y. Inriyani, "Evaluation of the P5 local wisdom activity program phase D in junior high schools," *EDUKATIF J. ILMU Pendidik.*, vol. 4, no. 6, 2022. doi: 10.31004/edukatif.v4i6.4177

[3] D. A. Saraswati *et al.*, "Analysis of P5 activities at SMA negeri 4 tangerang city as an implementation of differentiated learning in the independent curriculum," *J. Pendidik. MIPA*, vol. 12, no. 2, pp. 185–191, Jun. 2022. doi: 10.37630/jpm.v12i2.578

[4] I. Laili, Ganefri, and Usmeldi, "The effectiveness of developing project-based learning e-modules in the subject of electric motor installation," *J. Imiah Pendidik. dan Pembelajaran*, vol. 3, no. 3, 2019. doi: https://doi.org/10.23887/jipp.v3i3.21840

[5] Alexon and D. Handayani, "The development of e-LKPD with a Culture-Based Integrated Learning Model (MPTBB) to improve student learning outcomes on buffer solution material," *Int. J. Inf. Educ. Technol.*, vol. 14, no. 1, 2024. doi: 10.18178/ijiet.2024.14.1.2034

[6] R. Julian and Suparman, "Analysis of E-LKPD needs to stimulate critical thinking skills in solving problems," *Proceeding 1st Steeem*, vol. 1, no. 1, 2019.

[7] G. S. Nurulia and N. Qomariyah, "Development of E-LKPD based on learning cycle 5E on digestive system material to improve integrated process skills of grade XI high school students," *Berk. Ilm. Pendidik. Biol.*, vol. 11, no. 2, 2022. doi: 10.26740/bioedu.v11n2.p285-293

[8] X. Piao and S. Managi, "The international role of education in sustainable lifestyles and economic development," *Sci. Rep.*, vol. 13, no. 1, pp. 1–12, 2023. doi: 10.1038/s41598-023-35173-w

[9] A. Biancardi, A. Colasante, and I. D'Adamo, "Sustainable education and youth confidence as pillars of future civil society," *Sci. Rep.*, vol. 13, no. 1, pp. 1–11, 2023. doi: 10.1038/s41598-023-28143-9

[10] R. Satria *et al.*, *Pancasila Student Profile Strengthening Project,* Education Standards, Curriculum, and Assessment Agency, 2022.

[11] S. F. S.Sirate and R. Ramadhana, "Development of literacy skills-based learning modules," *Inspiratif Pendidik.*, vol. 6, no. 2, 2017. doi: 10.24252/ip.v6i2.5763

[12] A. Barokah, I. R. Kurnia, D. Maulana, and R. N. Umah, "Training and mentoring on the use of science e-modules at pondok bambu elementary school 06," *Lentera Pengabdi.*, vol. 1, no. 3, 2023. doi: 10.59422/lp.v1i03.117

[13] S. A. Aziz and K. Nurachadijat, "Project based learning dalam meningkatkan keterampilan belajar siswa," *J. Inovasi, Eval. dan Pengemb. Pembelajaran*, vol. 3, no. 2, 2023. doi: 10.54371/jiepp.v3i2.273

[14] M. Fathurrohman, *Curriculum 2013 Learning Paradigm Alternative Learning Strategies in the Global Era*, Yogyakarta: Kalimedia, 2015.

[15] Y. Purwati and L. Perdanawanti, "Design training using the canva application for members of the banyumas raya professional mothers community," *J. Pengabdi. Mitra Masy.*, vol. 1, no. 1, 2019. doi: http://dx.doi.org/10.35671/jpmm.v1i1.821

[16] E. A. Rahmasari and A. F. Yogananti, "Usability study of the canva application (case study of design student users)," *ANDHARUPA J. Desain Komun. Vis. Multimed.*, vol. 7, no. 1, 2021. doi: 10.33633/andharupa.v7i01.4292

[17] Sugiyono, *Quantitative and Qualitative Research Methods and R&D*, Bandung: Alfabeta, 2010.

[18] Sugiyono, *Research and Development Methods*, 2nd Edition, Bandung: Alfabeta, 2017.

[19] I. Hariono, I. Wiryokusumo, and A. Fathirul, "Development of a Google form-based cognitive assessment instrument for mathematics lessons," *Edcomtech J. Kaji. Teknol. Pendidik.*, vol. 6, no. 1, 2021. doi: 10.17977/um039v6i12021p057

[20] Sugiyono, *Quantitative, Qualitative, and R&D Research Methods*, Bandung: Alfabeta, 2013.

[21] I. M. Tegeh and I. M. Kirna, "Development of educational research method teaching materials with the ADDIE model," *J. IKA*, vol. 11, no. 1, 2013. doi: https://doi.org/10.23887/ika.v11i1.1145

[22] S. Zulaiha, M. Meisin, and T. Meldina, "Teachers' problems in implementing the independent learning curriculum," *Terampil J. Pendidik. dan Pembelajaran Dasar*, vol. 9, no. 2, 2023. doi: 10.24042/terampil.v9i2.13974

[23] I. W. Sulistyati *et al.*, *Pancasila Student Profile Project. Teacher's Guidebook for the Pancasila Student Profile Strengthening Project*, 2021.

[24] Z. Hasanah and A. S. Himami, "Cooperative learning model in cultivating student learning activity," *Irsyaduna J. Studi. Kemahasiswaaan*, vol. 1, no. 1, 2021. doi: 10.54437/irsyaduna.v1i1.236

[25] M. R. Kurniawan, "Analysis of learning media characters based on students' learning styles," *JINoP (Jurnal Inov. Pembelajaran)*, vol. 3, no. 1, 2017. doi: 10.22219/jinop.v3i1.4319

[26] Sari, "Development of project modules with creative characters on the theme of sustainable lifestyle for grade VII," Surakarta: Fakultas Keguruan dan Imu Pendidikan Universitas Sebelas Maret Surakarta, 2023.

[27] D. Irawati, A. M. Iqbal, A. Hasanah, and B. S. Arifin, "Pancasila student profile as an effort to realize national character," *Edumaspul J. Pendidik.*, vol. 6, no. 1, 2022. doi: 10.33487/edumaspul.v6i1.3622

[28] N. Rachmawati, A. Marini, M. Nafiah, and I. Nurasiah, "Pancasila student profile strengthening project in the implementation of the prototype curriculum in elementary school leader schools," *J. Basicedu*, vol. 6, no. 3, 2022. doi: 10.31004/basicedu.v6i3.2714

[29] D. Handayani, Elvinawati, Isnaeni, and M. Alperi, "Development of guided discovery based electronic module for chemical lessons in redox reaction materials," *Int. J. Interact. Mob. Technol.*, vol. 15, no.

7, 2021. doi: 10.3991/ijim.v15i07.21559
[30] T. Zhafirah, M. Erna, and R. U. Rery, "Development of e-module based on Problem Based Learning (PBL) in hydrocarbon material," *AL-ISHLAH J. Pendidik.*, vol. 12, no. 2, 2020. doi: 10.35445/alishlah.v12i2.263
[31] K. Dwiningsih, Nf. Sukarmin, Nf. Muchlis, and P. T. Rahma, "Development of chemistry learning media using virtual laboratory media based on learning paradigms in the global era," *Kwangsan J. Teknol. Pendidik.*, vol. 6, no. 2, 2018. doi: 10.31800/jtp.kw.v6n2.p156--176
[32] Kosasih, *Development of Teaching Materials*, Bumi Aksara, 2021.
[33] T. R. Padwa and P. N. Erdi, "Use of e-modules with a project based learning system," *Jav. J. Vokasi Inform.*, 2021. doi: 10.24036/javit.v1i1.13
[34] M. E. Kharisma, F. Faridi, and Z. Yusuf, "Instilling the character of mutual cooperation based on P5 at muhammadiyah 8 batu middle school," *J. Ilm. Profesi Pendidik.*, vol. 8, no. 2, 2023. doi: 10.29303/jipp.v8i2.1420
[35] A. S. Shibgho and I. Alfiansyah, "Project-based learning model in realizing the pancasila student profile in elementary madrasahs," *J. Pendidik. dan Keislam.*, vol. 239, no. 2, 2022.

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