

HPjBL to optimize output SDGs themed

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Abstract. This research described the achievements of project assignments in the form of SMA/MAN economics lesson plan with the theme SDGs, which is carried out by prospective teachers using HPjBL (Hybrid Project Based Learning) produced by students as prospective teachers in learning planning courses. This study used a qualitative descriptive approach and was carried out in 4 classes (A, B, C, and I) with offline HPjBL learning (Classes A and B) and online with the Sidia platform, which consists of online classes (Asynchronous and synchronous (Classes C and International). The research objects were students from the class of 2022 who are in 4 (four) classes (A, B, C, and International, a total of 93 people divided into 18 groups. The results showed that HPjBL learning is carried out was communicating with presentations carried out with a combination of online and offline classes via the SIDIA platform. In addition, output optimization occurred when the achievement of the lesson plan/RPP with the theme of SDGs material applied in class X is 61%, and in class, SDGs-themed material has been applied to 12 SDGs topics/themes, the output of lesson plans/RPPs with SDGs-themed material has been achieved as a whole at Very Complete criteria (67%).

1 Introduction

The 21st become the high challenging for the teacher, so, in realizing the dream of a 21st-century teacher, stakeholders, and policymakers have to design regulations or policies that can develop teacher capacity and educational curriculum [1]. Economic education undergraduate students are prospective teachers who must have pedagogical skills, including the skills to plan economic learning. Learning planning is a teacher's core task, this skill is learned by teachers [2]. These skills are provided by the institution (study program) through learning planning courses. So far, learning planning lectures at Surabaya State University have only been to fulfill output that is ready to be used in microteaching which has been required as a course assignment bill in the RPS (Semester Lesson Plan). To increase the

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meaningfulness of learning output for students' careers as teachers, the output that needs to be achieved must provide more meaning. Learning planning can be directed at building prospective teachers' awareness of the importance of making learning plans based on SDGs (Sustainable Development Goals) so that they can contribute to solving environmental problems through economic learning [3].

Teachers as social actors in the 2030 Agenda for Sustainable Development in learning practices [4]. By doing this, future education professionals will be able to incorporate Education for Sustainability into their teaching practices [5]. The concept of sustainable development is very necessary for prospective teachers to realize when preparing programs that can integrate the concept of sustainable development well [6]. In preparing the syllabus content, it is important to bridge the gap in SDGs coverage, so that there is relevance and effectiveness in achieving the SDGs [7].

Implementing the SDGs Program in mandatory teacher assignment courses, modern society faces the challenges of sustainability by harmonizing the balance of nature to preserve the environment to meet the needs of future generations [8]. The education sector is recognized as a key sector for solving problems regarding the topic of climate change which is a common problem, teachers are part of the mandate given responsibility in preparing the younger generation of society [9]. Scottish education policy conceptualizes Learning for Sustainability Learning for Sustainability (Lfs) [10]. This is also done by almost all countries in the world. There are important terms for the field of Environmental and Sustainability Education (ESE) such as EE, ESD, E4E, EfS, EJE, O/EE, and SE. Researchers often use these terms interchangeably [11]. However, in reality, to date, we have found limited theoretical, practical, and contextual applications in innovative practice, lack of sustainability literacy, and its implementation has better literacy but is still not satisfactory. These findings show that it is important to transform and modify education and the education curriculum towards Sustainability Education (SE) which will be very beneficial in the professional and ethical dimensions of the education system, especially in Indonesia.

Project Based Learning (PjBL) in Hybrid classes, Abdullah et al. [12] stated that Hybrid as a hybrid learning model is a hybrid learning model based on Moodle e-learning, syllabus, Linguistics course design teaching materials, and activities or student worksheet exercises which can improve students' learning abilities, especially in the English Department which includes aspects of knowledge, attitudes and skills under the demands of the current curriculum. In addition, current learning uses active, creative, and communicative learning strategies and techniques as well as flexible learning strategies and methods. This hybrid learning model is very compatible with the constructivist approach [13]. So in this research, the project-based model (PjBL) which includes constructivism is referred to as HPjBL. It is hoped that merging can predictably improve learning [14]. A similar approach to Problem-Based Learning (PBL) is highly recommended in learning in higher education [15]. The outcomes of learning depend on learning assessment methods [16-17]. Researchers would recommend research from Luppi [8] to design SDGs-based learning in learning that is important for the new generation. However, it is important to note that HPjBL certainly cannot be applied to all higher institutions.

Sustainability Development Goals (SDGs), constructivism is ensured by a consistent experimental teaching process, learning plans are designed using the principle of constructive alignment, curriculum design must begin by defining learning outcomes, and students must be given opportunities to build their knowledge [13]. Teachers and state officials are advised to design and implement teaching interventions in education for sustainable development and to verify and monitor them, considering that teachers and local state civil servants are responsible for environmental education policies [8]. The role of teachers is very important

to change destructive social behavior into sustainable behavior through teaching about sustainability [18]. It shows that the learning process is one of the important things to reach the SDGs.

This research will explore 1) learning activities in learning planning, which consist of: The HPjBL process applied to learning planning courses by OBE provisions; 2) Optimizing the output of project results from PjBL learning in learning planning courses according to the SDGs theme, which consists of: a) Achieving output/lesson plans based on class objects. 3) Achievement of module completeness based on MBKM; c) Achievement of SDGs-based materials. d) Application to types of teaching materials; e) Achievement of implementing the SDGs theme in lesson plans/RPP; f) Overall achievement between the characteristics of the MBKM lesson plan and the implementation of the SDGs.

Based on the introduction, the research question of this study is as follows:

1. Does PjBL process applied to learning planning courses in accordance with OBE?
2. How to optimizing the output of project results from PjBL learning process based on SDGs theme?

2 Literature Review

2.1 Project-Based Learning (PjBL) through Hybrid

DuPage [19] explains that hybrid learning is learning that combines face-to-face and online teaching into one cohesive experience. The terms blended learning and hybrid learning are the same as blended learning, a combination of traditional methods and modern methods implemented in hybrid learning combining face-to-face learning with computer and internet technology [20-22]. However, each has advantages and disadvantages. Hybrid-Project Based Learning (PjBL) is a combination of Hybrid and PjBL, as project-based learning to study and solve real-world problems in a project, with stages: the process of asking questions, processing and analyzing data, interpreting and evaluating results, and communicating [23]. Project-based learning (PjBL) is a model that can improve learning in higher education [14]. Learning based on a constructivist pedagogy project [24]. In project-based learning, there is a long-standing tradition in schools of “doing projects,” incorporating “hands-on” activities, developing interdisciplinary themes, implementing laboratory investigations, and creating useful artifacts or systems. Project-based learning is often described as consisting of five main stages: identifying a problem or need; investigating; planning technological devices; construction and problem solving; and evaluating, as illustrated in It is important to note that project-based learning is a cyclical process and not a linear process [1, 23]. This research will refer to the PjBL stages from Zhao et al. [23] which are considered to be the results of the latest research found, including: Stage 1, the process of asking questions; Stage 2, processing and Stage 3, analyzing data, Stage 4, interpreting and Stage 5, evaluating results and Stage 6, communicating with presentations to improve project results. Learning in higher institutions currently uses a platform, that consists of Asynchronous and Synchronous, even in the post-Covid era, learning has been combined into online learning (asynchronous and synchronous virtual face-to-face) and offline (face-to-face). This research will use PjBL in online, offline, and hybrid modes as the novelty of this research.

2.2 SDGs themes in learning

In the PBL model with an ESD context, it was found that the experimental group obtained higher learning outcomes than the control group with the conventional model, in the high category of emotional awareness [25]. Erica Zimmerman as the coordinator of the Education for Sustainability Network and a regular contributing editor at the Community Works Journal, being involved in education for sustainability (ESF) requires hard work, professional development, and community collaboration [26]. What are the real results of student and community achievement? Has there been a change in school culture? What are the indicators of school success in the ESF? This is a topic of conversation nationally and internationally. Indonesia will be in line with Malaysia which is preparing Malaysian Higher Institutions to implement green campuses, developing a “tailored” Green University Framework based on a localization approach, and exploring the readiness of Malaysian Higher Institutions to engage and measure the importance of implementing Green University (GU) initiatives in their respective organizations [27]. Design and implement teaching interventions on education for sustainable development and to verify their effectiveness through monitoring considering that teachers and local civil servants are responsible for environmental education policy [8].

SDGs Themes The Learning Objects created to cover the following topics: - History of sustainable development - Basic elements of the concept of sustainable development - Ecological, economic, and social implications of sustainability - Actions for sustainable development - Educating towards sustainability. Sustainability competence from the perspective of professional practitioners is labeled 'intervention competence', this ability consists of a series of interrelated knowledge, skills, attitudes, and behaviors which include: appreciating the importance of (trying to) make decisions or interventions; being able to learn from practical experience and relate this learning to one's own scientific knowledge; able to engage in political-strategic thinking, deliberation and action, related to different perspectives; the ability to demonstrate goal-oriented and adequate actions; adopt and communicate ethical practices throughout the intervention process; able to overcome levels of complexity, and ultimately able to translate the diversity of stakeholders into collectively produced interventions (actions) towards sustainability [28]. The emergence of problems resulting from human actions that endanger the ability of future generations to fulfill the necessities of life that come from nature requires them to restructure their education system in terms of environmental and sustainability education [29]. However, the results show that students are relatively knowledgeable about environmental issues, but their knowledge about elementary school is less than satisfactory, students have significant knowledge gaps regarding certain environmental and sustainability issues. This research will be useful in reducing the gap in this problem.

2.3 Completeness of lesson plan/RPP as output

New policy directions for teachers include: Teachers can freely choose, create, use, and develop an RPP format with 3 core components (other components are complementary and can be chosen independently): a) Learning objectives b) Learning activities c) Assessment. The teacher only prepares 1 (one) page, apart from that the lesson plan writing is done efficiently and effectively so that the teacher has more time to prepare and evaluate the learning process itself.

In the article in Teacher's Room [30], it is explained that lesson plans should contain General Information (selection of unit type and level of education; selection of phases and classes; selection of subjects; identification of special needs*; title of the lesson plan; general

description of the lesson plan; identity of the module author (name and origin of the organization); Cover image (optional). Module Objectives (Selection/uploading of Learning Objective Flow references which are used as a reference for preparing Learning Objectives for the entire lesson plan). Usage Plan (Total allocation of Lesson Hours (JP)**; Determination of learning mode (optional)**; Target students (optional); Number of students (optional); Facilities and infrastructure (optional); Competency prerequisites (optional).

The design of the complete module follows the minimum component requirements in the Learning and Assessment Guide (a complete lesson plan must at least include: learning objectives, assessment plan, activity details, and learning media (*Merdeka Belajar 11*, 2019). Contributors can choose "Already attached to the complete module ") and References (optional) (If references to other material sourced from PMM and/or from other credible sources are still required, contributors can upload the reference links in the reference column provided. In this research, the content of the module will be criticized: Very Complete: There are 3 core components: 3 core components: ▪ Learning objectives ▪ Learning activities ▪ Assessment + other components affective, psychomotor); Enrichment/remedy; Reflection. Complete: 2 Core components; Incomplete: 1 core component.

3 Methods

This research is a case study research using a qualitative approach. The case study research in this research is PjBL which is applied to learning planning classes for the class of 2022 for the even academic year 2023-2024. The object of this research is to optimize the output of the HPjBL learning model "Output of SDGs Themed Learning Planning Courses in the form of Economic Education Lesson Plans/ RPPs". The research subjects were students from the class of 2022 consisting of 4 (four) classes (A, B, C, and International). Details of research subjects are Class A used offline PjBL (27 people divided into 6 groups); Class B used offline PjBL (23 people divided into 4 groups), Class C used Hybrid PjBL (27 people divided into 5 groups) and International Class used Hybrid PjBL (16 people divided into 3 groups). In total, there were 93 people divided into 18 groups. Hybrid PjBL which consists of offline (face-to-face) and online (virtual face-to-face) learning consisting of Asynchronous and Synchronous learning. All classes held 7 meetings (before mid-exam/formative test).

The PjBL model is implemented through stages using stages: which are considered to be the results of the latest research found, including: Stage 1, the process of asking questions; Stage 2, processing; Stage 3, analyzing data; Stage 4, interpreted; Stage 5, turning the results; and Stage 6, communicating through presentations to improve project results [23]. Furthermore, this research also presents the results of the PjBL research project in the form of lesson plans/RPPs with the theme of SDGs. "The output of the SDGs-themed Learning Planning Course is in the form of Economic Education lesson plans/RPPs." To measure the completeness of the lesson plan/RPP, three measurement indicator criteria are used. In this research, the module content will be categorized as: Very Complete: There are 3 key components: 3 key components: ▪ Learning objectives ▪ Learning activities ▪ Assessment + other components affective, psychomotor); Enrichment/remedy; Reflection. Complete: 2 key components; Incomplete: 1 key component

4 Result and Discussion

This research examines PjBL OBE-based learning planning with the SDGs theme, through stages: including: Stage 1, (questioning) process of asking questions - Meeting 1; Stage 2, processing - Meeting 2; Stage 3, analyzing data - Meeting 3; Example of a lesson plan review

made (first review) - Stage 4, interpreting - Meeting 4; Stage 5, evaluating the results - Meeting 4. In small groups, discuss and the lecturer monitors the modules in each group and provides assistance in preparing the modules with in-class activities in presenting the results of Cambridge school field observations (Classes A and C offline) by Ardhita Eko Ginanjar, et al (Study field at SMAN 1 Rengel) and Class C and International asynchronous online classes regularly to optimize the results of the SDGs-themed economics lesson plan project. Online activities with Sidia were observed to optimize learning. Stage 6, communicating with presentations to improve project results - Meetings 5 (composing modules and guidance), 6 (composing modules and guidance), and 7 (module presentations) Group representatives present the results of economic lesson plans prepared through surveys on data sources that are trusted as valid data source in this research. Next, revisions are carried out for perfection. Offline classes show that students can display the results of the modules that were prepared and presented in front of the class and accompanied by the course lecturer. Student participants review their work by asking several questions and input for the presenters. Finally, input was obtained to improve the lesson plan. Online classes, in online classes with the *Sidia Asynchronous platform*, students are able to present the results of the modules that have been prepared via virtual face-to-face, other participating students respond with various reviews for improvement, the lecturer directs the results of the discussion to improve the lesson plan. After completing several stages of processing data from the results of student projects, interesting things about the application of SDGs in SDGs-themed lesson plans/RPPs with the SDGs theme were achieved, as follows:

Table 1. Achievement of the Independent Module with the SDGs Theme

Object Output-Lesson plan/RPP themed SDGs (1)	Lesson plan Class (2)	Module Contents (3)	Implementation of SDGs (5)	SDGs material (6)	Achievement of output (7)
Total Achievements from 18 sample groups	Class X= 11 Class XI=7	Module contents are very complete (17)	SDGs Material (12) No SDGs teaching materials (6)	Implementation of SDGs (12) No Implementation of SDGs (6)	Output of lesson plans and teaching materials: Complete (12) and incomplete 6)
Percentage (%) Achievement of the Independent Module with the SDGs theme From 18 sample groups	Class X = 61% Class XI= 39%	100% Very complete module	SDGs material (67%) No SDGs teaching materials (33%)	Implementation of SDGs (67%) No Implementation of SDGs (33%)	Output of lesson plans and teaching materials: Complete (67%) and incomplete 33%)

Based on the data above, it was found that the level of achievement of SDGs implementation from 18 sample groups that were experimented with through HPJBL in class X was 61% and in class XI it was 39%. Achievements based on the characteristics of the lesson plan, RPP as one of the product results with HPjBL as a whole from 16 sample groups were 100% having prepared very complete lesson plan/RPP criteria based on the MBKM (Merdeka-Learn-Kampus-Merdeka) curriculum.

Achievements seen from the teaching materials in column 4 that can be implemented for SDGs include: National Income; scarcity as the core problem of economics; Basic Concepts of Economics; Economic Development; Materials/teaching materials: Business Entities; Material on basic concepts in economics; Macro; economic activity; Scarcity and Human Needs; Human Needs; The role of business entities in the economy; BUMN, BUMS, BUMD;

Scarcity; Capital market; Economic agents; Economic activity; Market Structure; Needs and Scarcity of Resources; Economic Growth and Development.

The achievement of module preparation as one of the product results with PjBL as a whole from 18 sample groups with lesson plans/RPPs themed on SDGs material was (67%), and lesson plans/RPPs that were not themed on SDGs material was (33%). Skill in preparing SDGs material was found in lesson plans that implemented SDGs (67%) and SDG material was found in lesson plans that did not/had not implemented SDGs (33%). The achievement of SDGs-themed material on 12 SDGs topics/themes, which resulted included: 1) Citarum River which is located in West Java and is in the Citarum Watershed. Climate change, a source of gas emissions; 2) Greenhouse effect/Green House Gas (GHG), and carbon footprint along with sources of carbon footprint contribution; 3) Economic Development Issues; The Importance of Nature-Based Economic Development; 4) Business entities to manage their waste; 5) Why is it important to manage waste effectively (ii) How to manage waste effectively (iii) How good waste management can support business sustainability goals; 6) Link economic material from 4 sectors with SDGs goals, which are likened to RTP with SDGs and the environment at large; 7) Make a list of commercial and crucial human needs that come from the natural environment and how to produce them according to what you know, and do your needs affect environmental sustainability?; 8) Eco Culture Based Economic Learning and Eco Culture Based Learning Objectives; 9) Case study analysis of climate change on the availability of rice food in economic activities in Indonesia; 10) Scarcity of renewable resources (clean air) in big cities; 11) Green Economy: Growth and Environmental Sustainability in Verdana; 12) Case study analysis: Measuring the Impact of El Nino on Indonesian Food Security. The output of lesson plans/ RPPs with material on the SDGs theme was achieved as a whole in the criteria of complete (67%) and incomplete (33%). This study proved that the lesson plan with the material of SDGs has accordance with the future need.

5 Conclusion

HPjBL learning for SDGS-based learning planning courses is carried out through Stage 1, the process of asking questions; Stage 2, processing and Stage 3, analyzing data, Stage 4, interpreting and Stage 5, evaluating results and Stage 6, communicating with presentations to improve project results through a combination of online and offline classes via the SIDIA platform. In addition, optimization of output occurs when the lesson plan/ RPP is achieved: in 18 groups in class X it reaches 61% and in class XI it reaches 39%. Research subjects Lesson plans/ RPPs themed SDGs material were achieved (67%), found in lesson plans that implemented SDGs (67%), SDGs themed materials were able to be applied to 12 SDGs topics/themes, Output of lesson plans/RPPs with material themed SDGs was achieved overall the criteria are Very Complete (67%).

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