Learning Model Development: Simple Case Project Integrated Peer Learning Community

Atika Atika[1*], Sita Nurmasitah[1], Abdurrachman Faridi[2], Bayu Ariwibowo[3], Azarine Shafa Milannisa[1]

[1]*Department of Fashion Education, Engineering Faculty, Universitas Negeri Semarang, Semarang, Indonesia*
[2]*English Language Education, Universitas Islam Sultan Agung, Semarang, Indonesia*
[3]*Mechanical Engineering Vocational Education, SAINTEK Faculty, Universitas IVET, Semarang, Indonesia*
[*]*Email: atikaft@mail.unnes.ac.id*

ABSTRACT

Quality learning is important in the education system. UNESCO has formulated a Sustainable Development agenda 2030 which includes the Sustainable Development Goals (SDGs). Departing from this issue, the curriculum and education policies in Indonesia lead to this goal, namely Merdeka Belajar-Kampus Merdeka curriculum. One particularly engaging activity that supports students in learning outside the campus is project-based learning. Integrating project-based learning with simple case studies into PLC is highly effective. This approach aims to enhance problem-solving abilities and prepare students for the complexities of real-world challenges across disciplines. This study employs the research and development (R&D) approach. Research and development is a method used to produce specific products and test the effectiveness of these products. The development of the simple case project integrated with peer learning community learning model can be derived from three existing models: project-based learning, problem-based learning, and peer learning community. This results in a conceptual model comprising 8 learning syntaxes.

Keywords: *Learning Model Development, Simple Case Project, Peer Learning Community* .

1. INTRODUCTION

Quality learning is important in the education system. UNESCO has formulated a Sustainable Development agenda 2030 which includes the Sustainable Development Goals (SDGs) [1]-[3]. The fourteenth goal of the SDGs specifically highlights quality education and incorporates ESD principles. The targets and indicators in question are: (1) universal access; (2) quality education; (3) skills for sustainable development; (4) promotion of a culture of peace and non-violence; (5) global participation in education; (6) global citizenship education. SDG 4 as a whole reflects a global commitment to ensure that all people have equal and inclusive access to quality education [4]. Departing from this issue, the curriculum and education policies in Indonesia lead to this goal, namely Merdeka Belajar-Kampus Merdeka curriculum.

The Merdeka Belajar-Kampus Merdeka policy is a new enthusiasm for the education world. Studies show that if the MB-KM program is implemented to prepare graduates' soft and hard skills competencies aligned with the current developments, it yields positive results [5]-[7]. There are various activities students can engage in to meet this criterion, such as student exchanges, internships in industries, teaching assistance, or project-based activities. One particularly engaging activity that supports students in learning outside the campus is project-based learning. Providing projects or giving students the freedom to initiate their projects enables a more significant percentage of their learning to occur beyond the campus. The success of a project can serve as the basis for assessing students in one or multiple courses through a conversion or recognition process. Besides project-based learning, the MB-KM policy encourages collaborative learning through interdisciplinary communities. The goal is to address real societal issues that are typically complex and require multiple disciplines to resolve. Project-based learning concepts aid students in developing competencies aligned with the demands of the 4.0 industrial revolution. This approach assists students in

A. Kusumastuti et al. (eds.), *5th Vocational Education International Conference (VEIC 2023)*,
Advances in Social Science, Education and Humanities Research 813,
https://doi.org/10.2991/978-2-38476-198-2_53

tackling problems that reflect real-world complexities, preparing them for the demands of the evolving workforce.

Collaborative learning, also known as Peer Learning Community (PLC), enables students to collaboratively learn with peers from diverse academic backgrounds, supporting Society 5.0. Project-based learning is an innovative form of education that trains students to succeed in the 21st century [8]. PLC allows teams to connect their knowledge and work together to solve public issues [9]. Learning activities using the PLC model enhance motivation by fostering knowledge and experience sharing among peers. This collaborative approach facilitates a richer learning experience and cultivates essential skills needed to address contemporary societal challenges.

Integrating project-based learning with simple case studies into PLC is highly effective [10]. Implementing simple case study project-based learning involves selecting a topic, forming groups, creating a program plan and schedule, field observation, project completion, testing the project's outcomes, evaluation, and project reporting. Meanwhile, PLC requires team members with diverse academic backgrounds to solve problems collectively. A conceptual model integrating these two approaches might involve: 1. Selecting a topic, 2. Forming teams with different academic expertise, 3. Identifying problems, creating a program plan and schedule, 4. Conducting observations, 5. Identifying issues and devising solutions (tools, products, services, etc.), 6. Testing project outcomes, 7. Evaluating activities, and 8. Reporting the work [11].

This concept is designed to be flexible and applicable to various project activities. Reports and project outcomes can be used to analyze Learning Outcomes in each student's study program, allowing for conversion with specific courses. The urgency of this research lies in developing a multi-disciplinary learning model and fostering collaboration between professors and students. This approach aims to enhance problem-solving abilities and prepare students for the complexities of real-world challenges across disciplines.

2. METHOD

This study employs the research and development (R&D) approach. Research and development is a method used to produce specific products and test the effectiveness of these products. The steps involved in implementing the Research and Development (R&D) method can be seen in figure 1.

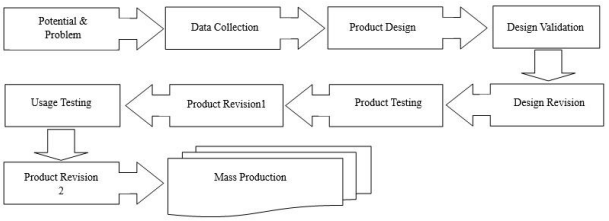

Figure 1 Steps in the Application of the Research and Development Method.

The ten steps of the R&D research are simplified up to the first product revision step as the final model. These steps are grouped into three main stages: the preliminary study stage, the development stage, and the product testing stage. These stages are implemented to ensure efficiency in terms of time and finances, enabling the product testing phase to occur on a limited scale. Research steps can be seen in Figure 2.

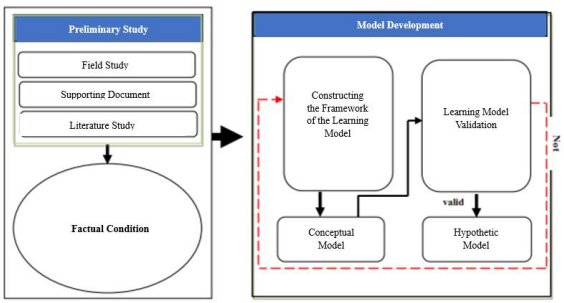

Figure 2 Steps in Research Model Development.

2.1 Research Stage

Steps in the Development of the Integrated Simple Case Project Model with the Peer Learning Community can be seen in Figure 2.

The steps taken to obtain the necessary data are as follows:

a. Conducting Field Studies

This involves understanding the factual conditions on the ground by administering questionnaires to several professors from 10 universities in Central Java who have implemented the MB-KM program. The questionnaire content comprises various information about the implementation of the MB-KM curriculum. The data gathered serves as initial information to design a strategy for creating the Simple Case Project integrated with the Peer Learning Community learning model.

b. Searching for Supporting Data and Documents

Seeking documents and previous analyses or research findings serve as tools to fortify the development of the learning model. Data utilized to reinforce this learning model's development includes

survey results from the government and community related to MB-KM, supporting documents, and theoretical data associated with MB-KM and the implementation of its curriculum. These data are summarized to form the basis for creating the learning model concept.

c. Determining Supporting Theories as the Foundation

This involves selecting relevant research data related to the Simple Case Project and Peer Learning Community learning models. The purpose is to derive precise steps for creating data collection instruments and analysing the gathered data based on the research and development of the model.

3. RESULT AND DISCUSSION

3.1 Preliminary Studies

a. The observation results indicate that project-based learning, case studies, and peer learning are being conducted separately. Information gathered from several instructors at the Faculty of Engineering, UNNES, suggests that 94% of the courses using the project-based learning model still focus on topics found in textbooks or course materials and have yet to be implemented inclusively or directed toward case studies. The peer learning community must be integrated into a well-organized and systematic learning system. Peer learning is only implemented when students participate in interdisciplinary research projects led by the lecturer.

Given this information, there is an urgent need to develop an integrated model of project-based learning coupled with peer learning community involvement to facilitate the implementation of specific courses characterized by their suitability. This integration aims to create an integrative, holistic, and problem-oriented learning approach that aligns with fundamental societal issues.

b. The policy study focused on the factual conditions of the MB-KM policy, established by the Ministry of Education and Culture of Indonesia. The MB-KM policy encourages higher education institutions to become more autonomous and flexible in learning. The right to study for three semesters off-campus supports the attainment of 21st-century competencies known as the 4C: Creativity, Collaboration, Critical Thinking, and Communication.

The implementation of the MB-KM policy urges higher education institutions to adapt their learning processes according to the established policy. Project-based learning is an intriguing activity that supports students in learning beyond the campus. Allowing students, the freedom to undertake projects enhances the percentage of learning that occurs off-campus. The success of a project can serve as the basis for assessing students in one or several courses through a conversion or recognition process.

Beyond project-based learning, the MB-KM policy also emphasizes collaborative learning through interdisciplinary communities. This policy shift aims to foster a collaborative learning environment that transcends disciplinary boundaries.

c. Supporting Theories

PLC helps improve a school as a place for learning and professional development. The significance of integrating Design Thinking is extensively discussed. The project shows how co-teaching can be applied, given a proper problem selection. Higher motivation and better behavior among students are noticeable [9].

Effective professional learning communities are crucial for supporting and developing the practice and identity formation of beginning teachers. Professional networks facilitate collegial learning and continuous improvement of the professional practice of all teachers and are especially important for out-of-field teachers. Rural practice is characterized by professional isolation, the need to be a 'specialist generalist,' and broad work and social networks that rarely include others working in a closely related professional specialization. In rural schools, Science, Technology, Engineering, and Mathematics (STEM) are frequently taught by beginning or out-of-field teachers [12].

The value of technical and entrepreneurial skills of experimental class students increased significantly; thus, the final learning model used a hypothetical model with the learning model name PjBL in Entre (Project-Based Learning Integrated with Entrepreneurship) [13].

Project-based learning (PjBL) is a promising approach that improves student learning in higher education [14].

3.2 Factual Model

Based on the preliminary study, the implemented project-based, case-based learning, and interdisciplinary community learning are as in figure 3.

Figure 3 Factual Model.

With immense benefits for learners, each of these three learning concepts has distinctive characteristics.

Integrating these concepts into a single model yields significant advantages. Meeting the demands of 21st-century competencies is achievable by utilizing this learning model. Developing the Integrated Simple Case Project with a Peer Learning Community Learning Model is an excellent concept for preparing learners to face the challenges of the 21st century.

3.3 Conceptual Model

A new model was developed based on the three main models: the Integrated Simple Case Project with a Peer Learning Community. This model serves as a bridge for collaboration between lecturers and students, both within a single discipline and across multiple disciplines.

The model concept consists of 6 steps, including:

1. Topic Determination: Involving case determination, self-direction, self-monitoring, self-correction, equality of consideration, and equal opportunity (across multiple disciplines).
2. Project Planning: Comprising power distribution, study questions, and small group work.
3. Schedule Arrangement: Incorporating equal opportunity, power distribution, periodic process monitoring, and group discussion.
4. Evaluation: Encompassing consultative learning, post-course evaluation, self-monitoring evaluation, and follow-up activities.
5. Testing: Involving self-correction, post-course evaluation, self-monitoring evaluation, discussion questions, and follow-up activities.
6. Monitoring: Comprising participatory evaluation, consultative and interpersonal learning, group discussion, small group work, and periodic monitoring.

Each stage is conducted collaboratively between the lecturer and the students. The conceived project will be carried out with several study programs that can collaborate. Conceptual model as in Figure 4.

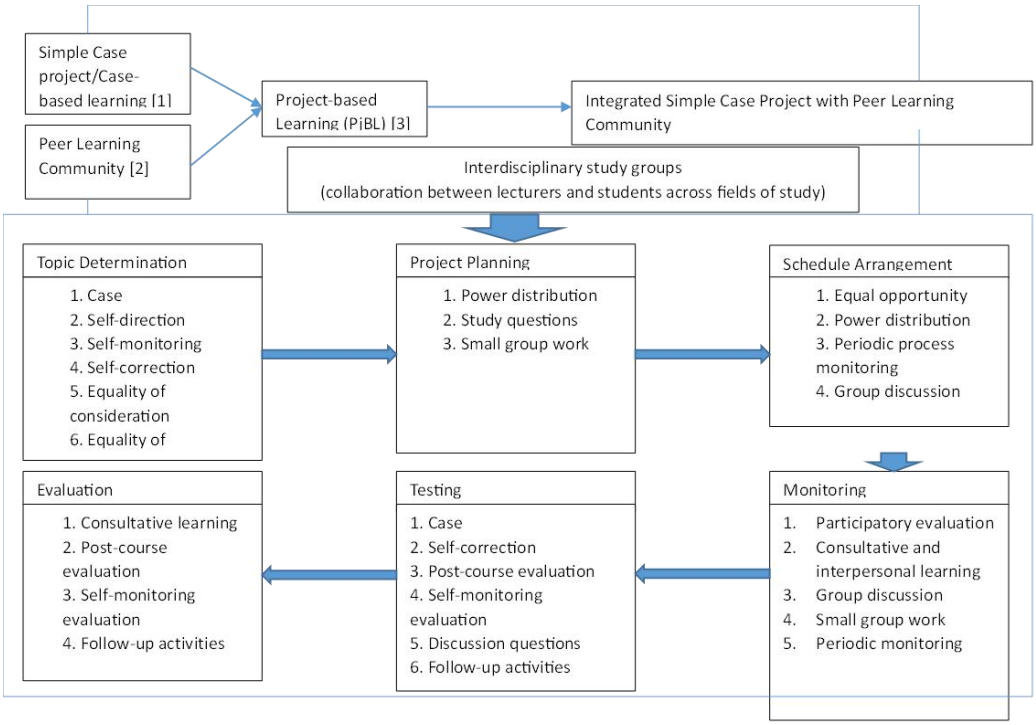

Figure 4 The concept of Integrated Simple Case Project with Peer Learning Community.

3.4 The Results of Research Instrument Validation

The validation test of the instructional model development instrument shows that the utilized instrument is valid, reliable, and suitable for developing a learning model.

3.4.1 Results of Conceptual Learning Model Validation

The conceptual framework of the learning model and the steps involved in implementing the Integrated Simple Case Project with the Peer Learning Community were validated by educational experts and practitioners. The validation outcome for the conceptual learning model scored 517 out of a maximum score of 560. With 28 questions posed, the percentage obtained from this learning model validation is 92.56%, categorized as 'Strongly Agree.'

3.4.2 Results of Conceptual Learning Model Revision

There were several notes regarding the validation results by the learning model validators. The revisions made to the learning model as in table 1.

3.4.3 Discussion of the Conceptual Model

The concept of this Learning Model is oriented towards product/project-based learning. It aims to ensure that every learning outcome from this model yields a product capable of providing real solutions to actual challenges.

This learning model employs the syntax of the Integrated Simple Case Project with a Peer Learning Community. The syntax of this learning model is derived by mapping the syntax of Project-Based Learning, Case-Based Learning, and Peer Learning Community. The result is the fundamental syntax of this learning model, which comprises eight components, namely:

1. Real Case Disclosure

Learning step 1 involves revealing a real-life case. Learners are divided into several workgroups, not limited to similar backgrounds. Forming heterogeneous groups is preferable. Learners are directed to analyze real-life cases occurring within their scope. This step allows learners to explore their thoughts on the cases to be resolved. The cases they discover can be simple but rather issues requiring solutions. Cases are determined based on the material being studied.

Educators play a role in providing examples of cases and their resolutions. They also validate the real cases presented by learners. Educators can also negotiate with learners for rewards and punishments during case resolution. The outcome of step 1 is a real case requiring a solution. Disclosing real cases trains learners to be sensitive to their environment, think critically, communicate effectively, collaborate, and be creative.

2. Project Analysis

In the second step, learners begin planning, analyzing, organizing, and documenting the project. Project analysis occurs after learners conduct preliminary studies in step 1. Learners document every crucial step discovered through visuals, videos, or writing. Educators play a role in guiding learners with the proposed project, providing feedback and solutions for any challenges encountered by learners.

The output of step 2 is the design solution for the case discovered in step 1. Project analysis trains learners to solve problems, communicate, broaden their perspectives, think critically, collaborate, be creative, and innovate.

3. Time Schedule Determination

Step 3 involves determining the schedule. In this phase, learners allocate time to complete the planned project, validated according to the set deadline. At this stage, each group can appoint a leader to guide every step of the project's completion. Learners have the freedom to allocate their time until the case is resolved. Learners are required to document significant and intriguing events. Documentation can be done through writing, capturing images, or creating videos. Educators play a role in monitoring and providing feedback on the timeline designed by learners.

The outcome of step 3 is a schedule document. Determining the time schedule trains learners in time management, discipline, attention to detail, and collaboration.

4. Job Description Determination

Step 4 involves determining job descriptions. Educators guide learners to delineate the tasks to be accomplished. Educators act as facilitators, guiding learners in defining the specific tasks to solve the case. The output of step 4 is a document outlining job descriptions. Determining job descriptions can train learners in communication, collaboration, creativity, and respecting diverse opinions encountered throughout the process.

5. Regular Consultation

Step 5 involves regular consultations. Learners report through presentations observed by educators and other groups. Learners present the background of the case determination, project plan, schedule, job descriptions, encountered challenges, and the solutions found. Learners can express intriguing aspects that need to be addressed by other groups. Learners are free to create engaging presentations using various media formats. Educators play a role in conducting initial assessments, considering learners' challenges, and concluding at the end of the learning process.

The output of step 5 is a presentation document and a 50-70% product result. The product here is not limited to a physical creation but can also be documented. Regular consultations can train learners in communication, collaboration, expressing opinions, and respecting differences in opinions.

6. Testing Phase

Step 6 involves testing the project outcomes developed by learners. The testing is conducted on a small scale concerning the targeted object. During the testing phase, learners analyze whether the proposed solutions can serve as the primary or alternative solution for the users. Educators play a role in evaluating each

step taken by learners. Additionally, educators monitor and provide feedback on the testing analysis conducted by learners. Testing trains learners in communication, collaboration, and expressing opinions.

Table 1. Learning Model Revision.

No	Validator	Suggestion	Revision
1	V1	The learning model is specified for both virtual and face-to-face learning.	Changing the model scheme tailored to virtual and face-to-face learning.
2	V2	Clarifying certain aspects to avoid double perceptions.	Specifying learning aspects according to their characteristics.
3	V3	The learning model is schematized for easier understanding and elaboration.	Creating a hypothetical model scheme accompanied by a description.

7. Final Outcome Evaluation

Step 7 involves evaluating the outcome. After conducting the testing and obtaining data, learners revise the project accordingly. Learners present the final evaluation, showcasing the completed project. They analyze the outcome against the initial plan, identifying differences and outlining any challenges encountered and their respective solutions.

8. Publication

This learning model employs an engaged approach involving research, active exploration, problem-solving, creation, and information sharing.

3.5 Model of Hypothetic

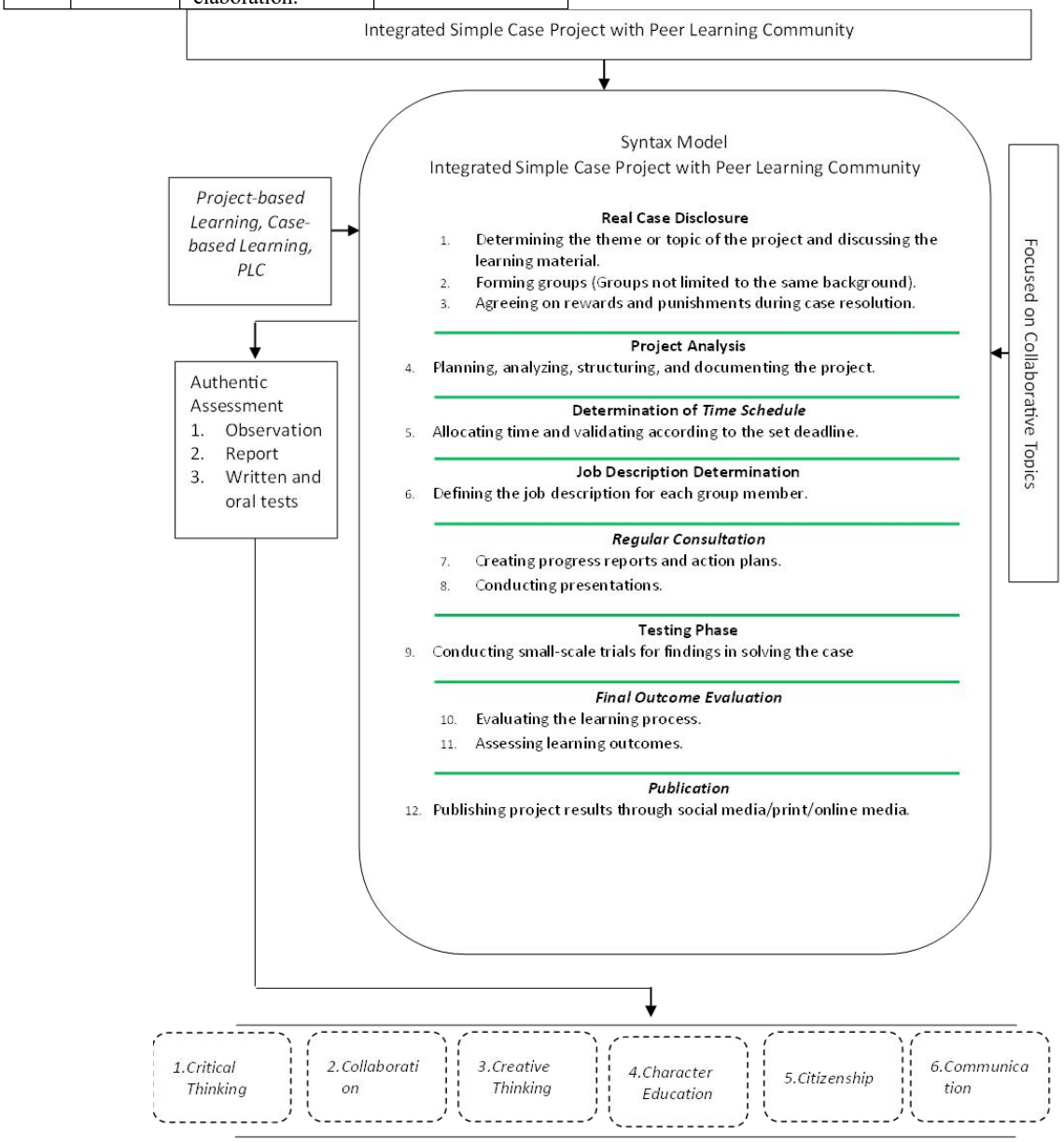

Figure 5 Integrated Simple Case Project with Peer Learning Community.

3.6.1 Conditions for Using the Hypothetical Model

The use of the hypothetical model adheres to the following conditions [15]:

a. Relevance to Learning Objectives: The learning model must align with the predetermined learning objectives. Ensure that the model can achieve the desired outcomes and support the attainment of the targeted competencies.

b. Learner-Cantered: The model should be oriented toward the learners.

c. Availability of Resources: This includes textbooks, technological devices, and support from the school or institution.

d. Flexibility: Flexibility allows educators to adjust the model to suit classroom dynamics.

e. Regular Monitoring and Evaluation: This aids in assessing its effectiveness and making changes if needed.

f. Continuous Learning: It should not solely focus on current material understanding but also develop relevant and transformative skills for the future.

g. Non-discriminatory and Inclusive: It should be non-discriminatory and inclusive of all students, regardless of their social, economic, or cultural backgrounds.

4. CONCLUSSION

The development of the simple case project integrated with peer learning community learning model can be derived from three existing models: project-based learning, problem-based learning, and peer learning community. This results in a conceptual model comprising 8 learning syntaxes.

REFERENCES

[1] World Health Organization, Health in 2015: from MDGs, millennium development goals to SDGs, sustainable development goals, 2015.

[2] Sachs, D. Jeffrey, G. Schmidt-Traub, M. Mazzucato, D. Messner, N. Nakicenovic and Johan Rockström, Six transformations to achieve the sustainable development goals, Nature sustainability, 2 (9), (2019), pp. 805-814.

[3] U. Sdg, Sustainable development goals. The energy progress report, Tracking SDG, 7, 2019, pp. 805-814.

[4] M. Melchiorri, M. Pesaresi, A. J. Florczyk, C. Corbane and T. Kemper, Principles and applications of the global human settlement layer as baseline for the land use efficiency indicator—SDG 11.3. 1, ISPRS International Journal of Geo-Information, 8(2), 2019, 96. DOI: https://doi.org/10.3390/ijgi8020096

[5] Anonymous, Kebijakan Merdeka Belajar Kampus Merdeka, Indonesia, 2022.

[6] R. Wahyuningtyas, D. Isynuwardhana, R. Rismayani and I. Gunawan, The Awareness and Implementation of MBKM Program as Flexible Learning in Faculty, Humaniora, 13(3), 2022, 231-239. DOI: https://doi.org/10.21512/humaniora.v13i3.8382

[7] K. Krishnapatria, Merdeka Belajar-Kampus Merdeka (MBKM) curriculum in English studies program: Challenges and opportunities, ELT in Focus, 4(1), 2021, 12-19.

[8] S. Bell, Project-based learning for the 21st century: Skills for the future, The clearing house, 83(2), 2010, 39-43. DOI: 10.1080/00098650903505415

[9] K. Phusavat, D. Delahunty, P. Kess and H. Kropsu-Vehkapera, Professional/Peer-Learning Community: Impacts on Workplace Training at Bangkok Metropolitan Administration (BMA) Schools, Journal of Workplace Learning, 29(6), 2017, 406-427.

[10] A. Mader, A classification of PLC models and applications, In Discrete Event Systems: Analysis and Control, Boston, MA: Springer US, 2000.

[11] W. Hu, A. G. Starr and A. Y. T. Leung, Two diagnostic models for PLC controlled flexible manufacturing systems, International Journal of Machine Tools and Manufacture, 39(12), 2000, pp. 1979-1991. DOI: https://doi.org/10.1016/S0890-6955(99)00022-X

[12] S. Kilpatrick and S. Fraser, Using the STEM framework collegially for mentoring, peer learning and planning, Professional Development in Education, 45(4), 2019, pp. 614-626. DOI: https://doi.org/10.1080/19415257.2018.1463925

[13] B. Ariwibowo, A. Slamet and R. Syamwil, R, Development of a project-based learning model integrated with entrepreneurship in the productive learning of motorcycle tune-up competence, Journal of Vocational and Career Education, 3(1), 2018. DOI: https://doi.org/10.15294/jvce.v3i1.13424

[14] P. Guo, N. Saab, L. S. Post and W. Admiraal, A review of project-based learning in higher education: Student outcomes and measures, International journal of educational research, 102, 2020, 101586. DOI: https://doi.org/10.1016/j.ijer.2020.101586

[15] T. Karakose, Assessing the relationships between internet addiction, depression, COVID-19-related fear, anxiety, and suspicion among graduate students in educational administration: A structural equation modeling analysis, Sustainability, 14(9), 2022, 5356. DOI: https://doi.org/10.3390/su14095356