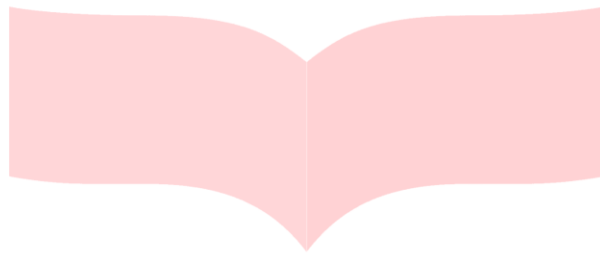




**GUIDEBOOK OF
OUTCOME-BASED
EDUCATION USING
LEARNER-CENTERED
METHODS**

2024

Versi 1.1



This Guidebook serves as a "dynamic guide" that opens for improvement, update, and enhancement according to the dynamics of needs and eras.

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USING LEARNER-CENTERED METHODS GUIDEBOOK

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PREFACE

Assalamu'alaikum Wr. Wb

Education is a strong foundation in building a bright future. In the era of ever-developing information and technology, Telkom University is always committed to providing quality and relevant education by preparing students to become competent leaders in various fields. In an effort to realize it, the guidebook to "Outcome-Based Education Using Learner-Centered Learning Methods" is developed at Telkom University.

Based on our philosophy and commitment to quality education, this guidebook aims to provide practical guidance on the development of learner-centered learning methods that enable each student to better achieve their potential. In this book, it explains the outcome-based approaches and how learner-centered learning methods can be effectively applied in the educational environment at Telkom University. This book outlines concepts, strategies, and best practices that can help educators design and implement engaging, interactive, and student-centered learning experiences.

This guidebook is expected to assist learners in understanding, developing, and implementing learner-centered learning methods. May learners benefit from the information presented in this book, and together we contribute to the development of a better and more meaningful education. And may this book be a valuable source of inspiration and guidance in the journey to improve the quality of education and create a positive impact for Telkom University.

Wassalamu'alaikum Wr. Wb

Bandung, July 2024

Dr. Dadan Rahadian

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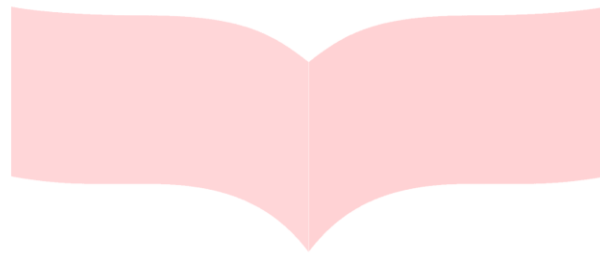
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GLOSSARY OF TERMS

- Subject Matters : Contain knowledge from a particular discipline or knowledge that is learned by the learner and can be demonstrated by the learner (Anderson & Krathwohl, 2001).
- Learning Outcomes : The ability obtained through the internalization of knowledge, attitudes, skills, competencies, and accumulated work experience (*Perpres* No. 8, 2012).
- Learning Evaluation : One or more processes of interpreting data and evidence accumulated during the assessment process (Guidelines for the Preparation of Higher Education Curricula, 2020).
- Higher Order Thinking Skills (HOTS) : Complex process of dissecting material, making inferences, constructing representations, analyzing, and building relationships by involving the most basic mental activities (Resnick, 1987).
- Assessment Criteria : The benchmark is used as a measure or reference for learning achievement in assessment based on predetermined indicators. Assessment criteria are guidelines for assessors to ensure that assessments are consistent and unbiased. Assessment criteria can be quantitative or qualitative (Brookhart & Nitko, 2015).
- Curriculum : A set of plans and arrangements regarding the objectives, content, and learning materials as well as the methods used as guidelines for organizing learning activities to achieve higher education goals so as to produce qualified graduates in accordance with the specified qualifications (*Permendikbud*, 2020).
- Higher Education Curriculum : The curriculum developed by each university with reference to the national standards of higher education for each study program, which includes the development of intellectual intelligence, noble morals, and skills, as stated in Law No. 12 of 2012 on Higher Education: Article 35, Paragraph 2 (Law, 2012).

- Massive Open Online Courses (MOOCs) : A type of online learning with a large number of audience and an open format. The most prominent characteristic of MOOCs is that the learning is designed for self-directed learning/self-paced learning.
- Course : A unit of study taught (and learned by students) at the tertiary level (source: *KBBI*) which is prepared based on the LOs imposed on it, containing learning materials, forms and methods of learning, and assessment and has a minimum weight of one semester credit unit (SKS).
- Learning Materials : Knowledge (facts, concepts, principles, theories, and definitions), skills, processes (reading, writing arithmetic, dancing, critical thinking, communication, etc.), and values (Hyman, 1973).
- Learning Methods : Techniques applied to implement learning strategies by maximizing the use of learning resources, including learning media (learning method = a way in achieving something) (Joyce & Weil, 1980).
- Learning Model : A structure designed based on principles of learning, theories of psychology, sociology, systems analysis, and other theories that provide support (Joyce & Weil 1980).
- Learning : The process of student interaction with lecturers and learning resources in a learning environment.
- Blended Learning : A learning approach that harmoniously, structurally, and systematically combines the advantages of face-to-face and online learning.
- Higher Education : The level of education after secondary education, which includes diploma programs, undergraduate programs, master's programs, doctoral programs, and professional programs, as well as specialist programs, all organized by higher education institutions based on the culture of the Indonesian nation.
- Learning Experience : The learning activity of the learners through interaction with external conditions in their learning environment (Tyler, 1949). Learning activities that transform learning

- materials into meaningful knowledge that can be used to do new things (Ornstein & Hunkins, 2004) and provide benefits.
- Assessment : One or more processes of identifying, collecting, and preparing data to evaluate the achievement of Learning Outcomes (LOs) and curriculum objectives (Guidelines for Preparing Higher Education Curricula, 2020). Assessments must be motivational, fostering confidence to contribute to the choice of life path as a lifelong learner. Then, learners use specialized skills to work within the superteam of their choice.
- Program Educational Objective (PEO) : A general statement that describes what graduates are expected to achieve in a few years after graduation. The Program Educational Objective (PEO) is based on needs and predicted future capabilities.
- Study Program : A unity of educational and learning activities that have a certain curriculum and learning methods in one type of academic education, professional education, and/or vocational education.
- Course Outline (RPS) : A course is a learning process plan that is prepared for learning activities for one semester to fulfill the Learning Outcomes (LOs) imposed on the course. Course Outlines, or other terms, are determined and developed by lecturers independently or collaboratively in an expertise group in a field of science and/or technology in the study program.
- Learning Management System (LMS) : A system used to carry out the learning process by utilizing Information and Communication Technology (ICT) and is the result of systematic integration of learning components with regard to quality, learning resources, characterized by learning interaction (engagement) across time and space. The important purpose of the LMS is to provide access and facilities for learners to build their knowledge independently and purposefully, and to give lecturers an important role as designers, triggers, facilitators, and

- motivators of learning.
- Graduate Competency Standards (SKL) : The minimum criteria regarding the qualifications of graduates' abilities which include attitudes, knowledge, and skills which are stated in the formulation of Learning Outcomes (LOs) (*Permendikbud* No. 3 of 2020: Article 5(1)).
- VCON Class : An online lecture method where online lecturers and online learners can have face-to-face learning interactions.



I. INTRODUCTION

This introductory chapter presents the basic concepts of Outcome Based Teaching and Learning (OBTL), an approach that emphasizes the desired learning outcomes as central to the implementation process of Outcome Based Education (OBE), as well as how this approach can be integrated into curriculum, learning, and assessment to improve the effectiveness of OBE implementation.

1.1 Rationale

Outcome Based Education (OBE) is an educational philosophy that emphasizes the achievement of learning outcomes as the main focus of the educational process at Telkom University. In the OBE framework, Outcome Based Curriculum serves as the foundation that determines the structure and substance of what students must learn to achieve certain competencies by the end of the learning process. In its implementation, a strategy is needed to align the outcomes with the syllabus or course outline, namely through Outcome Based Teaching and Learning (OBTL), which is a method of actualizing Outcome Based Curriculum into classroom practice and determining 'how' these outcomes can be achieved through effective and interactive learning strategies. Outcome Based Education, Outcome Based Curriculum, and Outcome Based Teaching and Learning are a series of interrelated concepts in the context of education. In OBTL, there are learning strategies and assessment methods to ensure that every aspect of learning aims to achieve predetermined outcomes effectively.

Regarding learning in the Industrial 4.0 era, or often referred to as Education 4.0, there have been many significant transformations in terms of approaches, methods, and goals in education. In this era, education no longer focuses only on the process of knowledge transfer but also on developing skills that are relevant to technology and the changing needs of the workforce. One of the prominent features of the Education 4.0 era is the extensive use of information technology in the learning process, so that lecturers and students have access to a wider range of learning resources and can learn in more diverse times and places. Education 4.0 also promotes lifelong learning, which recognizes that individuals need to continuously learn and adapt to the rapid development of technology.

In addition, there has been a shift in the way learning resource needs are fulfilled. Previously, resources included printed books, classroom learning materials, and other

resources available in the library. Nowadays, these have turned into electronic media that can be accessed easily and quickly via the internet. This indicates a change that not only impacts the transfer of technology in the industrial world but also impacts wider areas of life at an exponential rate of change. Technological advancement in education is beneficial in the expansion of accessibility, collaboration, communication, value diversity, active and social learning, self-direction, content engagement, project-based learning, and global exposure.

Currently, both lecturers and students, who are referred to as learners, can easily access online educational resources, such as online courses, learning videos, and e-learning platforms. This allows learners to choose learning resources according to their own interests and schedules, removing geographical barriers in access to education. The availability of communication devices such as smartphones and tablets has made a new communication model between lecturers and students, between lecturers, between students, and also other support personnel. The interaction between lecturers and students can take place anytime and anywhere, which allows learners not to be constantly on the campus ground, but can also determine other enjoyable environments that facilitate their learning and provide real-world experiences needed in life after completing their education. Education 4.0 explicitly demands lecturers and education managers to provide more choices than before, including more personalized choices (Personalized Learning) according to students' interests and talents. These choices include how students learn, how lecturers teach, and how to manage learning that is required to be more open, more flexible, and attuned to the use of technology in accordance with the heutagogy approach, which is a highly learner-centered learning approach. This approach provides an in-depth understanding of the concept of Self-Directed Learning (SDL) and encourages learners to be active in planning, managing, and evaluating learning independently. In addition, it is important that changes related to learning not only focus on achieving students' learning competencies or mastery of knowledge in accordance with their fields, but also require the ability to develop multidisciplinary, interdisciplinary, and transdisciplinary science and technology, while also accommodating the formation of character and noble virtues.

In reality, this also presents challenges in evaluating and filtering online education resources to ensure the quality of learning. Therefore, it still requires guidance and assistance so that the scientific information sought is accurate and in accordance with the learning objectives.

According to George Courous, technology will never replace great teachers, but in the hands of great teachers, technology is transformational (Dabbagh, Marra, & Howland, 2018). To accommodate these challenges, Telkom University designed the 2024 Curriculum with the aim of "Education for Sustainable Development," which applies fundamental principles organized into four pillars, namely Alignment, Adaptive, Flexible and Sustainability as shown in Figure I.1.

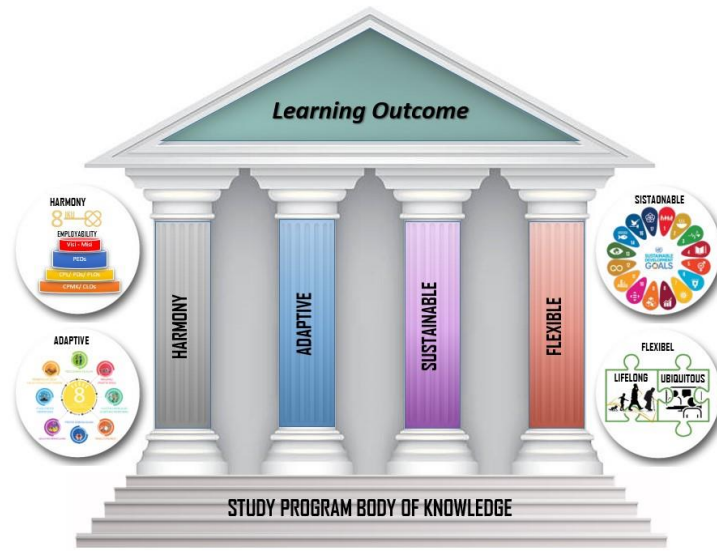


Figure 1.1 The Four Pillars as Fundamental Principles

These four pillars are used to support the scientific framework (Body of Knowledge) in achieving the learning outcomes of the study program. The first pillar of Curriculum 2024 is Alignment, where in the preparation of the study program, curriculum must be developed and arranged in harmony with the vision and mission of the University, as described in each element of the tiered learning outcome targets. The second pillar of Curriculum 2024 is Adaptive, where the curriculum must be developed and organized by applying principles that are able to adapt to the needs and environmental conditions in which the curriculum will be implemented. This ensures that the study program can produce talents that are adaptive to rapid and dynamic changes in the external environment. The third pillar of Curriculum 2024 is Flexible, where the curriculum must be designed by prioritizing the ease of access to learning from anywhere and anytime "Learning from Everywhere" through the support of information technology in accordance with the concept of ubiquitous learning. This pillar also emphasizes for strengthening the learning process through participatory and

collaborative learning activities thoroughly using the "Active Learning" method that utilizes technology so as to support the "Learning from Everywhere" approach. Participatory and collaborative learning is a shared learning approach (using case-based learning and project-based learning) that involves interaction and active participation between individual learners to produce capitalization of attitudes, knowledge, and skills to achieve certain learning outcomes. Finally, the fourth pillar is sustainability, where the curriculum needs to be developed and structured in alignment with some of the goals of the sustainable development blueprint, aiming to achieve a better and more sustainable future for all within the framework of the Sustainable Development Goals (SDGs).

In its implementation, Curriculum 2024, especially in the third pillar, states that the curriculum must be designed by promoting easy ways of learning through innovative and student-centered learning methods. This approach places students as active subjects in the learning process, allowing them to develop independent thinking skills, critical thinking, creative and logical action, communication skills, problem-solving, and a deep understanding of the material provided. In this case, the success of learning also depends on the appropriateness of chosen learning methods and learning activities. Therefore, lecturers must have creativity in choosing forms and methods of learning that encourage students to develop skills through several activities, including teamwork, collaboration, creative action, and argumentative skills. In other words, the role of lecturers in facilitating the learning process must include the ability to develop a learning system that focuses on students and can provide opportunities for students to gain their own knowledge from various learning sources and meaningful learning experiences. Such learning methods also encourage collaboration between lecturers and students, where lecturers act as facilitators who guide, encourage, and provide constructive feedback. In addition, this also supports the concept of lifelong learning, where lecturers as learners also need to be encouraged to continuously update their knowledge to acquire the knowledge and skills needed to develop and implement learning methods in line with students' learning needs.

1.2 Purpose of the Guide

Through this guidebook, Telkom University hopes to change the conventional learning paradigm into a more progressive approach that suits the needs of learners in the current era. Thus, the approach can provide a more relevant, engaging, and effective learning

experience for lecturers and students as learners. This includes encouraging students to be actively involved in the learning process, developing metacognitive skills, and promoting critical thinking and creativity in accordance with the National Higher Education Standards, which places students at the center of learning by achieving Learning Outcomes (LOs) through a learning process that prioritizes the development of creativity, capacity, personality, and meets student needs. In addition, this guide can be used to create an inclusive learning environment where every learner feels valued, supported, and has equal opportunities to develop. Through this guide, Telkom University also seeks to improve the quality of the learning process by facilitating lecturers in the selection of innovative learning methods to support the achievement of learning objectives in accordance with the characteristics of the field of study and the material being taught. This is in line with the Key Performance Indicators (IKU) of Higher Education, especially IKU 7 (seven) collaborative and participatory classes that use case-solving learning methods (Case Method) or group learning based on project (Team-Based-Project) as part of the evaluation weight. As such, this guide aims to create better educational experiences and empower lecturers and students to become competent and adaptive lifelong learners.

II. CHARACTERISTICS OF THE LEARNING PROCESS

Learning is an interaction between students, lecturers, and other learning resources in a learning environment that must prioritize the development of creativity, capacity, personality, and student needs, as well as develop independence in seeking and finding knowledge. In the implementation of learning in Telkom University study programs, there are minimum criteria or standards for the learning process to achieve Learning Outcomes (LOs). This learning process standard refers to the standards set by *SN-Dikti* (National Standard for Higher Education) where the learning applied must include interactive, holistic, integrative, scientific, contextual, thematic, effective, collaborative, and student-centered characteristics, as illustrated through Figure II.1.

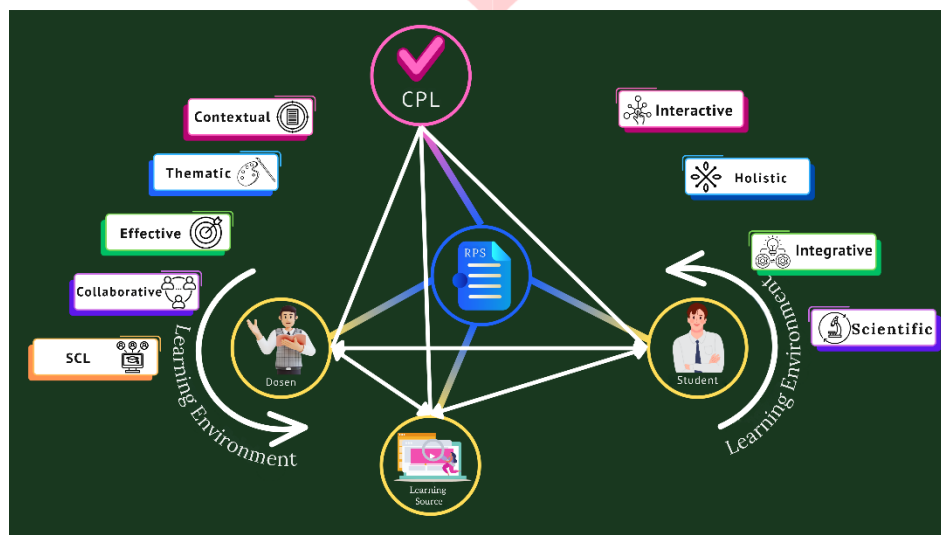


Figure II.1 Learning Process Characteristics

In addition to the above characteristics, there are four additional characteristics, which are Constructive, Reflective, Multisensory, and Higher Order Thinking Skills (HOTS).

2.1. Interactive

According to Warsita (2008), interactive is two-way communication. When explained, interactive is a characteristic of the learning process which states that the Learning Outcomes (LOs) are achieved by prioritizing a two-way interaction process between students and lecturers through student-centered learning. This encourages students to be actively involved because of an engaging and meaningful learning process. This approach

not only involves direct participation from students, but also creates a dialogical learning environment where learning is part of a communicative social process. There is a continuous exchange of ideas between lecturers and students, as well as between students. Through this method, it is possible to increase student enthusiasm for the material through various learning media in the pursuit of achieving learning outcomes.

2.2. Holistic

Holistic learning is one of the characteristics of the learning process that encourages the formation of a comprehensive and in-depth understanding by integrating local and national excellence and wisdom. In the learning process, students are encouraged to connect the information learned with other topics to build a comprehensive and in-depth knowledge framework. The characteristics of this learning process encourage students to gain learning experience by utilizing all the potential of their mind, soul, and body actively and effectively. For example, in studying strategies to handle a disease outbreak, students need to understand other aspects such as climate, culture, and population levels in the region.

2.3. Integrative

Integrative characteristic is a learning process that aims to meet the overall Learning Outcomes (LOs) in a unified learning program through an interdisciplinary and multidisciplinary approach. An example of integrative characteristics that can be done is to encourage learners to be able to connect or identify relationships between different topics or fields.

2.4. Scientific

The scientific characteristic prioritizes a scientific approach to create an academic environment based on a system of values, norms, and rules of science while upholding religious and national values. Learning with scientific characteristics involves a series of activities, including presentation of phenomena and formulation of problems, formulation of hypotheses, design and implementation of data collection to test hypotheses, management and analysis of data that has been collected, and drawing conclusions. Although not all aspects of learning can apply this characteristic at the tertiary level, students need to experience learning that is similar to the process of discovering

knowledge by experts. This experience also helps train students in a systematic approach to solving problems they may face in the future.

2.5. Contextual

This characteristic is learning that is tailored to the demands of problem-solving abilities in the field of expertise to achieve Learning Outcomes (LOs). In learning with contextual characteristics, knowledge and skills are acquired in accordance with students' areas of expertise. Contextual learning can also mean that the learning material presented by the lecturer is related to real life through REACT activities/strategies, Relating, Experiencing, Applying, Cooperating, and Transferring (Davtyan, 2014).

2.6. Thematic

According to Poerwadarminta (Abdul Majid, 2014), thematic learning is integrated learning that uses themes/main ideas to connect several courses so as to provide meaningful experiences to students. The principles underlying the thematic learning process are: 1) integrating several study materials in a theme that is in accordance with the scientific field of study; 2) addressing real problems related to the theme; 3) solving problems with a transdisciplinary approach involving several disciplines and/or methods; and 4) providing direct experiences for students in solving real problems. These thematic principles must be reflected in the Course Outline (RPS) in the form and method of learning, as well as student learning experiences. Essentially, all student-centered learning methods can integrate thematic principles.

2.7. Effective

Effective characteristics are learning processes that are concerned with understanding/internalizing the material properly and correctly within an optimum period. The strategy that can be done for effective learning is to carry out learning design in accordance with the Program Learning Outcomes (CPL/PLO) and Course Learning Outcomes (CPMK/CLO). Achieving effective characteristics requires a thorough learning design that includes all essential components such as materials, interaction, assessment, and evaluation. The effectiveness of learning can be observed through the evaluation of the process and learning outcomes.

2.8. Collaborative

Collaborative characteristics state that the Learning Outcomes (LOs) are achieved through a shared learning process that involves interaction between individuals to produce capitalization of attitudes, knowledge, and skills. The process of collaborative learning and interaction between learners to achieve the Learning Outcomes (LOs) certainly requires a well-designed learning environment. Examples of collaborative characteristics in learning can be seen in group discussions, group assignments, and group practicums, where there is interaction between group members, and each actively contributes to the group activities.

2.9. Learner-Centered

The characteristics of learner-centered learning, as mentioned in SN-Dikti, indicate that Learning Outcomes (LOs) are achieved through a learning process that prioritizes the development of learners' creativity, capacity, personality, and needs, as well as developing independence in seeking and finding knowledge. Learner-centered learning is a characteristic of learning that gives an active role to learners to improve their ability to learn independently and gives them full trust and responsibility for their learning. It also provides the opportunity to expand beyond the capabilities for which it was designed. Through these characteristics, it is expected that graduates of the study program will have strong independent learning skills and become lifelong learners who are able to adapt to the changes that occur. On the other hand, the role of the educator becomes that of a designer, facilitator, and motivator in the learning process.

2.10. Constructive

Constructive characteristics allow students to incorporate new ideas into their pre-existing knowledge. This process helps students to not only memorize information, but also understand the deeper meaning of what is learned. In a constructive learning environment, students are encouraged to explore their curiosity and confront their doubts in a critical and analytical way. Through combining new ideas with existing knowledge, it will help the gradual and deeper development of knowledge, ultimately improving their ability to apply what they have learned in various contexts. Constructive learning also encourages students to become lifelong learners, continuously seeking and building new knowledge based on existing understanding.

2.11. Reflective

Reflective characteristics allow students to make what they have learned a part of the learning process itself. Students are invited to actively reflect on their learning experiences, evaluate what they have learned, and understand how the new knowledge can be applied in various contexts or real-world problems. This reflection process helps students internalize knowledge, so that they do not just remember information, but also understand its deeper meaning. In this way, students can identify their strengths and weaknesses and develop strategies for future improvement. Reflective learning encourages students to continuously improve and develop, making each learning experience a step forward in their academic and personal journeys.

2.12. Multisensory

Multisensory is a method that involves various senses, such as sight, hearing, taste, smell, and touch, to help learners understand information better. This approach not only improves students' understanding and retention, but also motivates them to learn in an active and fun way. Multisensory learning techniques can be visual (using images and videos), auditory (music and stories), kinesthetic (physical activities), tactile (real objects), and gustatory (taste). By using various techniques and selecting those that are appropriate to the content, multisensory learning can be an effective method for students, including those with special needs, by providing hands-on experiences that help students understand the material more deeply.

2.13. High Order Thinking Skills

High Order Thinking Skills (HOTS) learning encourages students to go beyond memorization and understand concepts deeply. High Order Thinking Skills (HOTS) challenge students with complex problems, encouraging them to think creatively and innovatively in search of solutions. High Order Thinking Skills (HOTS) also equip learners with the ability to analyze, evaluate, and construct their own logical arguments. In addition, HOTS frees learners to generate innovative ideas, connect different concepts, and find unconventional solutions. Furthermore, High Order Thinking Skills (HOTS) encourage students to reflect on their own thinking, evaluate their learning, and develop the ability to understand how they learn. High Order Thinking Skills (HOTS) also train students to communicate ideas clearly, logically, and coherently.

III. LEARNER CENTERED LEARNING METHOD

Currently, the shift in the educational paradigm has encouraged a learning process that focuses from lecturers to students, which ultimately requires changes in the academic atmosphere to ensure that the teaching and learning process can develop optimally to achieve the expected competencies. These changes include improvements in curriculum design that better accommodate learning needs through more student-centered approaches, such as active learning, which encourage the development of social, collaborative, and leadership skills that will be beneficial for life after graduation. Student Centered Learning (SCL) has long been widely recognized as an approach to learning.

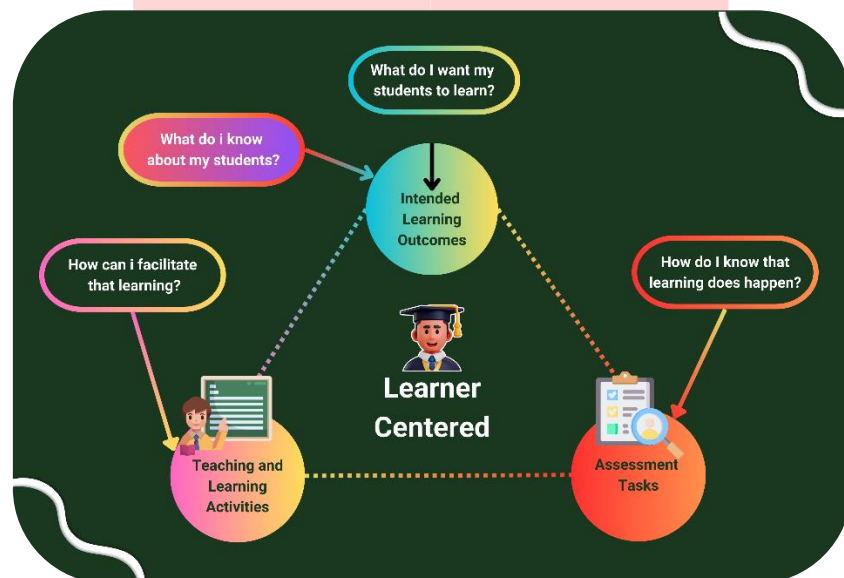


Figure III.1 Learner Centered Learning

In a broader sense, Student Centered Learning (SCL) describes the power of interaction between students and lecturers. Lea, et al (2003) formulated the principles of SCL, including: 1) a tendency towards active rather than passive learning; 2) an emphasis on deep learning and understanding; 3) increased responsibility and accountability on students; 4) increased independence of student learning; 5) interdependence and mutual respect between lecturers and students; and 6) a reflective approach to the teaching and learning process by both lecturers and students. However, of the various SCL methods developed, not all are claimed to have been done correctly (Lea, et al., 2003).

Nowadays, the concept of SCL has far developed into Learner Centered Learning (LCL) where every individual can be a learner. This paradigm recognizes that learning is a lifelong process open to all, regardless of age, background, or occupation. Learner-Centered Learning promotes personal responsibility for learning and self-development. It emphasizes the importance of the ability to identify learning needs, organize resources, and manage time efficiently. In this context, information technology and digital resources play an important role in providing easier access to various learning materials, online courses, and online learning communities. In addition, learner-centered learning also encourages collaboration between individuals. This emphasizes that learning is no longer solely focused on the instructor and students, but also involves peers, mentors, and a supportive learning community. As such, learning is not only a tool to achieve academic goals, but also a means for continuous personal, professional and social growth throughout life. In this era, the ability to be an effective learner is a key skill in dealing with the rapid changes in the modern world. In its implementation, LCL is also related to Active Learning (AL), as both complement each other in creating effective and empowering learning experiences for learners. In the practice of teaching and learning process using LCL principles, students are also placed at the center, and it is important to ensure that they are fully engaged and active in the learning process. On the other hand, lecturers also need to act as facilitators or mentors who support students' activeness in exploring knowledge. In a class where the LCL concept uses AL, the lecturer is tasked with designing learning activities that trigger active participation, encourage discussion, and motivate students to think critically. For this reason, this section will describe some AL methods that are adapted from various reference sources. Meanwhile, the rubric of the assessment will be described in Chapter IV. Here are some methods that can be used as powerful tools in supporting the LCL approach:

3.1. Small Group Discussion



Figure III.2 Illustration of Group Discussion Guided by Lecturer

a. Preparation

- 1) Lecturers should prepare teaching materials and develop guidelines for group discussions.
- 2) Lecturers choose topics or materials that are relevant to the learning objectives and allow students to think critically.
- 3) Lecturers group students into small groups of 3 - 5 members (can be done randomly or based on certain indicators).
- 4) Lecturers may provide an identity for each group formed (can also be done independently by students).

b. Implementation

- 1) Students/group members interact with each other in learning by exchanging ideas, information, experiences, and providing solutions to the problems discussed.
- 2) The lecturer acts as a facilitator and may also act as a moderator in the discussion.
- 3) For example, the lecturer may use this method to discuss the planning of a new product in groups. Then, students are asked to develop ideas and realization plans on the topic, which will later be presented in front of other groups.
- 4) Assessment using the formative method can be given to each student in the aspects of mastery of the material, the structure of written reports, presentations skills, the

ability to answer questions posed in the question-and-answer process, or the attitudes and skills demonstrated by students during group discussions.

- 5) Assessment can use rubrics or portfolio instruments. The recommended rubric is the analytic rubric, or the perception scale rubric discussed in Chapter V.

Notes:*

There are five things that need to be considered for SGD to be effective, namely: 1) maintaining positive interdependence, meaning that each member motivates one another in learning interaction; 2) individual accountability, mutual support and help between group members to cover each other's shortcomings and weaknesses because each member is likely to have a diverse level of ability and learning speed; 3) Face-to-face interaction, or interact directly to build interaction in learning, both among students and between students and lecturers; 4) Each group member has a role as a learning resource in the context of peer learning.

Peer learning is often more effective at understanding ideas and solving problems together due to the equal level of communication. This promotes social skills, including polite behavior, respecting others' opinions, listening without dominating, and having the courage to make suggestions and defend logical thinking; 5) group processing, \ which focuses on evaluating the extent to which each group member can interact effectively in achieving a common goal, as well as assessing the level of participation and cooperation so that it can be improved in the future.

c. Conclusion

- 1) The results of the formal assessment during the implementation of learning can be used by lecturers to evaluate the mechanisms and procedures of the discussion for improvement.
- 2) At the end of the discussion session, the lecturer as moderator can provide feedback and input related to the material discussed.
- 3) In addition, a reflection session can also be conducted at the end of the Small Group Discussion (SGD), which can be used by students to improve their learning results according to the recommendations given by the lecturer.

3.2. Peer Learning

Peer Learning is the process of learning together/in groups that have similar or different levels of knowledge, experience, or skills. This interaction and collaboration engage students in learning, where students can contribute to each other's understanding and enrich knowledge through discussion, exchange of ideas, and helping each other with anything related to the group. This method can be applied to other learning methods. Here is one implementation of Peer Learning in the Jigsaw learning method.

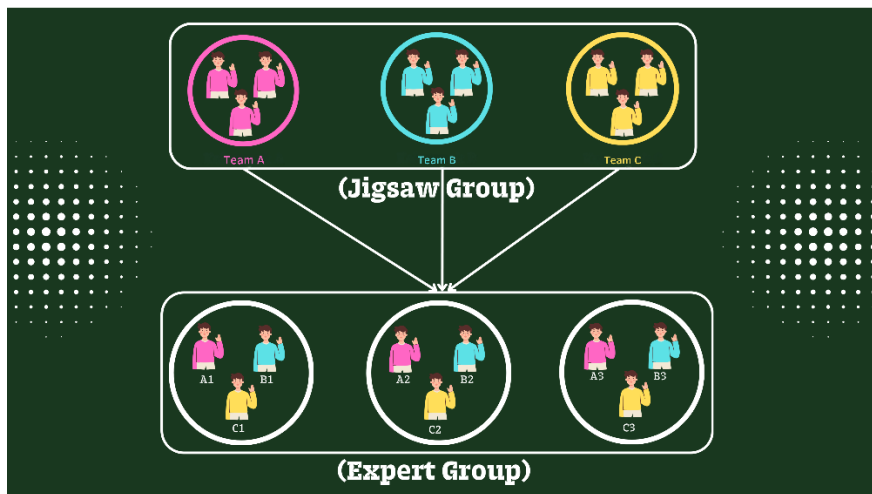


Figure III.3 Illustration of Jigsaw Learning Method

a. Preparation

- 1) Lecturers prepare materials that must be discussed by the groups.
- 2) Lecturers create original groups by considering students' expertise, level of understanding, and level of communication. Each member of the original group will get a different topic to determine their expert group.
- 3) Lecturers provide clear instructions on the tasks or activities to be performed. The instructions can be in the form of rules, restrictions, and clear outputs.
- 4) Lecturers ensure that participants have access to relevant resources, materials, or content for learning.
- 5) Then, the lecturer will create and determine expert groups that come from the original group according to the topic studied.
- 6) Lecturers ensure sufficient time is available for participants to carry out peer learning activities.
- 7) Lecturers prepare clear holistic assessment criteria or rubrics.

b. Implementation

- 1) Students gather according to their original group and study their respective topics/materials with the time limit set by the lecturer.
- 2) Afterward, students gather into expert groups according to their topic/matter.
- 3) Students learn and discuss according to their level of understanding and access to resources through the online media prepared by the lecturer.
- 4) Groups may ask questions to the lecturer through the features that have been prepared by the lecturer.
- 5) After the discussion, students reconvene in their original groups and share the learning outcomes from their expert groups.
- 6) Lecturers provide feedback regarding understanding and identify areas that need to be completed or corrected during the course of the discussion if any.

c. Conclusion

- 1) Representatives from the original group can explain the understanding that has been learned in front of the class to equalize understanding with other groups.
- 2) Lecturers can provide summative assessment through a holistic rubric according to each student's understanding of the material obtained during the Peer Learning process.

3.3. Collaborative Learning

A learning method that focuses on cooperation between students based on the mutual agreement of group members. According to Klemm (1994), this method has the following characteristics: 1) positive interdependence, 2) interaction, 3) individual and group accountability, 4) development of interpersonal skills, 5) formation of heterogeneous groups, 6) sharing of knowledge between lecturers and students, 7) sharing of authority or roles between lecturers and students, and 8) lecturers as mediators. The advantages are that students can develop the ability to work together, foster tolerance, mutual reliance, motivate each other, and foster leadership. However, the disadvantages are that it is difficult to apply to classes that have inadequate knowledge and skills, especially in the early classes that are in the adaptation and socialization stage, and it may not work if the lecturer does not have the ability to motivate and manage the group well.

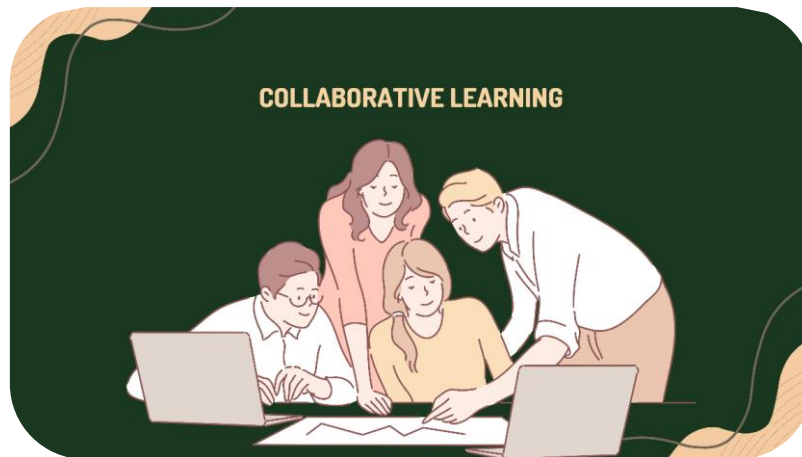


Figure III.4 Illustration of Collaborative Learning Methods

a. Preparation

- 1) Lecturers prepare a course activity design consisting of open-ended problems/tasks/cases, each of which must have multiple and more than one answers.
- 2) The activity design of the course can be created in a document format that contains the course title, objectives, topics, and how the sequence of activities will be carried out by students in completing tasks in groups.
- 3) Lecturers must prepare the formulation of indicators and assessment criteria in the form of holistic and analytic rubrics.
- 4) Students create groups of 3 - 5 members based on interests.
- 5) Group work procedures, determination of the time and place of discussion/group work, up to how the results of discussion/group work are to be assessed by the lecturer are decided by the students by mutual consensus among group members.
- 6) Students need to have an initial understanding of the task at hand. In this process, the lecturer can provide teaching materials and resources in the form of main material and supporting materials.

b. Implementation

- 1) Each group member has a different task to complement each other.
- 2) The task begins with reading a number of theoretical materials or concepts related to the assigned task to be done together.
- 3) Then, the results of the reading are discussed again to reach an agreement.

- 4) The lecturer acts as a facilitator, motivating, or providing instructions around learning together in groups.

Notes:*

Lecturers need to understand the learning outcomes of the Collaborative Learning method, which are that students have the ability to appreciate opinions, share ideas, and make decisions together.

c. Conclusion

- 1) Lecturers can assess not only cognitive learning outcomes (summative) but can also conduct formative assessment by evaluating students' ability to discuss.
- 2) Lecturers are recommended to choose formative assessment methods with analytic rubrics in assessing student learning processes and providing feedback.
- 3) Lecturers may also select peer evaluation (peer assessment) to conduct the assessment.

3.4. Role-play and Simulation

Role-Play is a method that facilitates students in learning by dramatizing, simulating, playing or acting out, demonstrating a scenario related to real-life phenomena and in accordance with the topics discussed. This method aims to develop soft skills, both social and personal. This method has the advantage of increasing interaction between students, practicing management skills as well as communication/argumentation, fostering responsibility, courage, and involving students' emotions. However, some of its disadvantages include: it takes time from preparation to discussion and evaluation, and success highly depends on the readiness and commitment of students in playing the role.



Figure III.5 Illustration of Role-play and Simulation

a. Preparation

- 1) Lecturers prepare targeted learning outcomes, topics, or cases to be used, and draft scenarios that also contain roles and situations.
- 2) The lecturer prepares a draft of the rules for the implementation of Role-Play as material to be discussed and agreed upon.
- 3) Apart from the lecturer, the draft scenario can also come from the group that will perform.
- 4) The roles are divided according to the scenario that has been made, and can be done individually or in groups.
- 5) Adjusting the classroom layout based on the scenario. The classroom can be set up to create the feel of a real situation, such as a courtroom or hospital emergency department, with appropriate equipment and costumes. However, classes can also be made simple without any special equipment or costumes.
- 6) Students study the topic of scenario draft material to support the execution of Role-Play.

b. Implementation

- 1) Students (individually/group) play their roles according to the scenario that has been prepared.
- 2) Non-participating students or groups can take on the role of observer who must write down important notes from the scenario being played out.

3) Lecturers observe and note the implementation of formative assessment using an analytic rubric to evaluate aspects that require assessment and feedback, such as how to interact, argue, and emotional involvement from students.

c. Conclusion

Students and lecturers discuss two things, namely the results of the analytic rubric or evaluation of the play that can be used as material for reflection for future Role-Plays, and evaluation to see how far the implementation of Role-Play can achieve student learning targets for both actors/players and observers.

Notes:*

This method increases interaction between students, as each group must have a discussion before and after the role play. Neither the lecturer nor other observers are allowed to intervene or interrupt the process. However, if the play deviates from the scenario, causing potentially dangerous situations, the lecturer can intervene and even stop the activity.

3.5. Cooperative Learning

This is a structured learning method designed by lecturers to solve or work on a problem/case in groups. This method is highly structured due to the formation of groups, the material discussed, the steps of discussion, as well as the final product that must be produced, are all designed by the lecturer. Students, in this case, play an active role in the discussion and follow the guidelines designed by the lecturer. Some of the advantages of this method are that it can encourage active learning habits, increase the sense of responsibility for individuals and groups, improve the ability and skills of cooperation and improve social skills. There are 5 principles of Cooperative Learning according to Johnson and Smith (2006), namely: 1) Positive interdependence, 2) Face-to-face interaction, 3) Individual and group accountability, 4) Interpersonal skills, and 5) Assessment of group functioning.



Figure III.6 Illustration of the Cooperative Learning Method

a. Preparation

- 1) Lecturers prepare a problem or assignment form to be solved by students in groups.
- 2) Group formation is carried out by the lecturer proportionally according to the design of the problem to be solved, with each group consisting of 3 - 5 members.
- 3) Groups are made up of students of varying academic abilities.
- 4) Lecturers can assign roles to each student member.
- 5) Lecturers design the learning process that will be carried out by students.
- 6) Lecturers present information or concepts of learning materials.

b. Implementation

- 1) Lecturers convey objectives and motivation to students, and present information or concepts of learning materials.
- 2) Each member of the group has an equal share of the task and will later show the results of the work in a forum.
- 3) Students perform and complete the tasks and materials provided by the lecturer in groups.
- 4) Students play an active role in discussions conducted in groups by discussing and concluding problems/cases to solve learning materials in groups.
- 5) Each group member has the same task and there is a forum to show the results of the task between groups so that students gain perspectives from other group members.
- 6) Lecturers guide and monitor the study groups.

Notes:*

There are fundamental differences between the Cooperative Learning method and Collaborative Learning method, in which Cooperative Learning allows group members to have equal shares of the task so that group members will get perspectives or points of view from other members. Whereas in Collaborative Learning, group members have different parts of the task to complement each other's goals. In addition, in Cooperative Learning, all activity agendas are fully organized by the lecturer, and students only follow the instruction given.

c. Conclusion

- 1) Students present group results.
- 2) If needed, lecturers conduct formative assessment related to the formulation of indicators. Assessment criteria may be in the form of analytic or portfolio rubrics.
- 3) Lecturers can conduct formative assessment using class discussion techniques, observation, peer assessment, and surveys as outlined in the analytic rubric.
- 4) Lecturers provide feedback on the results of the analytic rubric to students.
- 5) Lecturers may also conduct summative assessment by evaluating group work and assessing the presentation of group results as outlined in a holistic rubric.

3.6. Case Based Learning

Case-based learning is a method that involves students in real-world situations presented in the learning process to improve problem-solving and decision-making skills. Cases can be real or fictional stories relevant to the study material or it may recount events, problems, dilemmas, theoretical, or conceptual issues that require analysis and/or decision making (Kemendikbudristek, 2021).

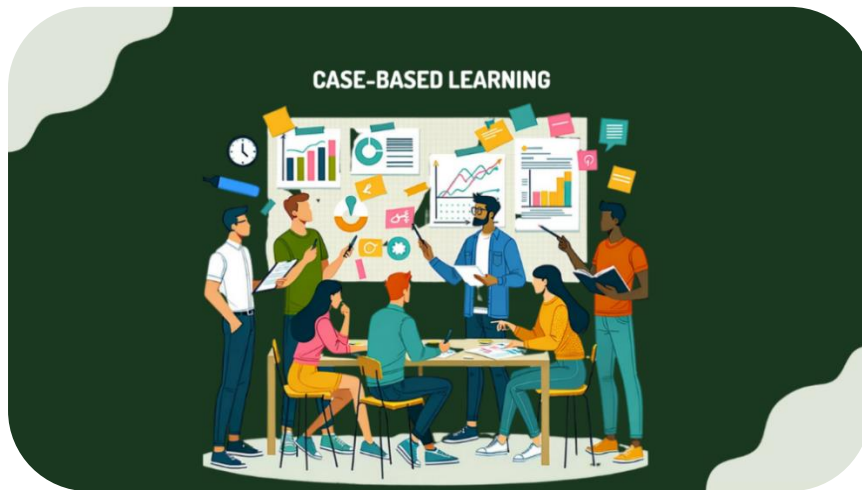


Figure III.7 Illustration of Case Based Learning

This method has the advantage of being able to train students to learn contextually, think critically, introduce problem-solving procedures as well as decision making, and provide opportunities to integrate prior knowledge with existing problems in order to learn to make professional decisions, explore their potential, develop ideas and appreciate tolerance, democracy and other people's opinions. However, there are weaknesses in this method, including learning is not optimal if students have not mastered the material/case, requires a long time in managing class dynamics, and may not be carried out properly if the lecturer is not creative and actively looking for relevant cases.

a. Preparation

- 1) Lecturers prepare cases that will be discussed based on the learning outcomes achieved in the course in narratives.
- 2) The lecturer determines the procedure, time allotted, and alternative solutions to the problem.
- 3) This method can be combined with the Small Group Discussion method, where the lecturers group students into small groups of 3-5 members (can be done randomly or based on certain indicators).
- 4) Students receive their assigned case study from their group.
- 5) Students prepare various literature sources including fact finding according to the assigned case.

b. Implementation

- 1) Lecturers can start the activity by explaining the learning outcomes to be achieved, and then distribute cases and facilitate groups (if done in groups).
- 2) Students identify problems and analyze them to find alternative solutions by discussing with the group.
- 3) Students analyze the case to build a recommended solution to test and develop the best solution design for the problem.
- 4) The results of group discussions are presented in class to get feedback from other students or groups.
- 5) The lecturer makes observations and, if necessary, can provide additional information needed by the group.

c. Conclusion

- 1) Lecturers gather students or groups for a class discussion and report the results of their discussions, which include analysis and solutions to the selected problems.
- 2) Students present the problem solving of their assigned case study.
- 3) Students from other groups give feedback.
- 4) Lecturers provide reinforcement on the conclusions or results of student work.
- 5) The lecturer can bridge theory and practice, as well as clarify (emphasize) what the group has learned and ask the group about impressions as a reflection on the process and results of learning.
- 6) If the presentation is done at the end of the semester, the lecturer can conduct a summative assessment related to the presentation or final report from students using a holistic rubric.

Notes:*

The key to the success of the case study is the "involvement" of the students. Therefore, the lecturer needs to pay attention so that each student has an equal opportunity to actively participate in the group. In this method, the given case is more specific (mini case) than in Problem Based Learning.

3.7. Problem Based Learning

The Problem Based Learning (PBL) method is a learning method that challenges students to solve real-world problems. The problem should be authentic, meaning that it comes from a real-world situation and is rooted in the principles of a particular discipline. The problem is

presented clearly, easy to understand, and covers all the material taught in accordance with the time, space, and resources available. Students must search or extract information (inquiry) to be able to solve or find alternative solutions to the problem.



Figure III.8 Illustration of the Problem Based Learning Method

a. Preparation

- 1) Lecturers prepare problems relevant to the learning outcomes and based on complex real-world situations requiring deep understanding.
- 2) Lecturers also need to prepare guiding questions that help students identify the necessary information and direct their problem-solving efforts.
- 3) Lecturers can also prepare technical instructions from a case so that problem solving meets expectations.
- 4) This method can be combined with the Small Group Discussion method, where the lecturer groups students into small groups of 5-10 members (can be done randomly or based on certain indicators).

b. Implementation

- 1) The lecturer introduces the big picture of the problem to the students.
- 2) Lecturers provide guidance or statements that help students to understand the problem.
- 3) Group members independently search for information through literature, the internet, or other resources. Group members must learn how to evaluate the information found and use it to support the identification of problems, gaps, and practical solutions.

- 4) Group members collaborate by periodically coming together as a group to discuss problem-solving progress, consider different approaches, and reflect on group members' understanding of the topic.
- 5) Lecturers as facilitators can guide group discussions, provide feedback, and direct students if they experience difficulties.

Notes:*

The following are the differences in characteristics between the Problem Based Learning and Case Based Learning methods according to Mari K. Hopper (2018).

Table III.1 Characteristic Method Differences between Problem Based Learning and Case Based Learning Methods

Characteristics	Problem Based Learning	Case Based learning
Advance Preparation	No advance preparation required	Advance preparation required
Activity	Based on the case	Based on the case
Learning Objectives	Written by students	Provided to students
Organization	Small groups (4-8 students)	Small groups (4-8 students)
Implementation	Self-directed learning	Self-directed and shared lecturer learning
Lecturer's role	Provide limited guidance	Provide active guidance
Q&A	Open	Structured
Number of Sessions	Multiple sessions	Single session
Conclusion	Student presentations	Conclusions by the lecturer

c. Conclusion

- 1) Problem Based Learning can conclude with the presentation of the results of student solutions or recommendations, after which the lecturer or students from other groups may provide feedback on the results presented.
- 2) Lecturers assess students' ability to solve problems using formative methods through Peer Review (peer evaluation), self-assessment, or direct assessment using analytic rubrics.

3.8. Project Based Learning



Figure III.9 Illustration of Project Based Learning Method

The project-based learning method is a systematic learning method that involves students in learning to acquire skills through a structured exploration process of authentic and complex questions, to then demonstrate performance and be accountable for the results of group work in the form of a product. The project may be a combination of several courses applied to solve a particular problem. Therefore, this learning method can ideally be implemented at levels two to four because students are considered to have received theoretical knowledge necessary to support this project-based learning model.

In Bloom's taxonomy, project-based learning is included in the ability levels of applying, analyzing, evaluating, and creating. Activities in this model include improving students' evaluation skills by examining theories related to the data obtained, as well as building students' abilities in terms of oral and written communication skills through collaborative research reports in a research project. Another advantage is that it gives students the experience of learning and practicing managing projects (including making allocations of time and other resources). On the other hand, the disadvantages include requiring a significant amount of time and the possibility of students not mastering the learning material comprehensively if the topics of each group are different and if students have weaknesses in information gathering. These weaknesses can be overcome by limiting the time allocated and ensuring the groups prepare their presentation well so that constructive feedback can be given.

a. Preparation

- 1) Students are grouped into several groups to work on an assigned task for a set period.
- 2) The group can consist of 4-5 students, which can be determined by the lecturer or based on student interest as needed.
- 3) Lecturers prepare real-world problems that occur in society or complex questions that are projected to be solved in groups and produce a product in a certain period.
- 4) Lecturers as facilitators help students explore the problem in general by strengthening knowledge and skills.
- 5) Students may use technology in data collection, data analysis, and presentation.

b. Implementation

- 1) The lesson begins by asking prompting questions to guide students in determining the problem and to agree on the problem to be solved. The questions have a relation to the real-world situations and students' experiences and are challenging for students to solve.
- 2) Students agree on a problem-solving plan by considering the conditions of their abilities, equipment, and infrastructure that allows for the project's implementation. In this case, technology may be used.
- 3) To support problem solving, it is necessary to create a series of activities using a flow chart, and then design a block diagram where each part of the block diagram needs to be clarified.
- 4) Students carry out the stages in project-based learning implementation, namely problem identification, design planning, schedule preparation, monitoring, results testing, and project evaluation. This process also needs to be known by lecturers.
- 5) Students actively carry out the stages of problem solving that have been designed by conducting collaborative discussions.
- 6) Lecturers monitor the progress in the project's completion by students, both the activities and quality of the project products according to the set standards.
- 7) Lecturers can conduct formative assessment through observation techniques, class discussions, Peer Assessment, or surveys related to the progress made by the group using analytic rubrics.

Notes:*

The learning process is focused on making a product as a solution to a problem. Creating a product as a result of the project is what distinguishes it from the Problem-Based Learning method. The resulting product must answer the driving problem or prompting question, reveal the students' level of conceptual understanding, be meaningful, and help students to master the concepts of the study material studied.

Project-Based Learning and Problem-Based Learning are two learning approaches that are similar in some aspects, but they have significant differences in approach, such as the project context in Project-Based Learning is much broader and more structured and can cover a wider or multidisciplinary topic.

c. Conclusion

- 1) At the final stage, students in groups present the product produced to solve relevant problems.
- 2) Students in groups present the final product/work produced to solve relevant problems to lecturers and other audiences.
- 3) Students' active participation in project completion and discussion, and product quality, are also assessed with appropriate techniques and instruments.
- 4) At this stage, reflection on the student learning experience is conducted.
- 5) Students engage in discussions, either individually or in groups, to share their experiences. Lecturers and peers provide feedback, which is documented to enhance performance and improve the final product.
- 6) Lecturers can conduct summative assessment with the project/presentation/final report of the product that has been produced using a holistic rubric.

Whereas in Problem-Based Learning, it is often smaller and focused on a specific context and designed to illustrate a particular concept or principle. Project-Based Learning also focuses more on creating a larger and clearer final product, which may include sequential steps to achieve it, whereas Problem-Based Learning focuses more on the learning process, problem-solving, and understanding of concepts rather than on the final product.

3.9. Discovery Learning and Inquiry

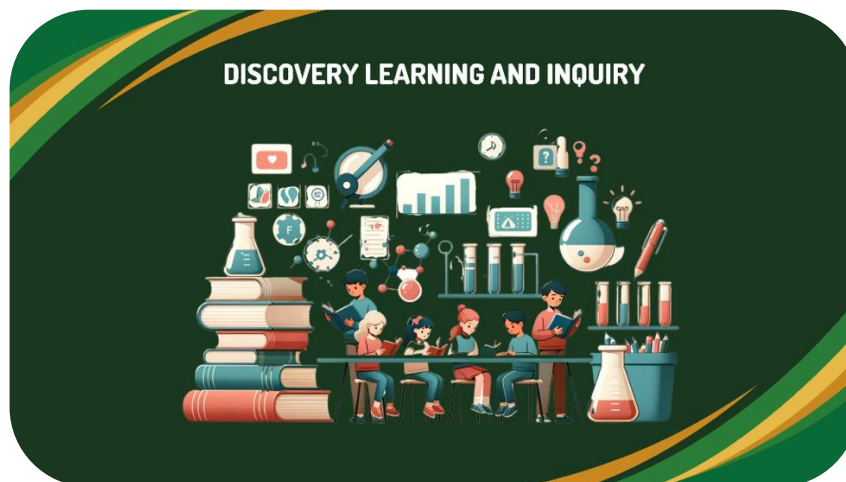


Figure III.10 Illustration of Discovery Learning and Inquiry Learning Methods

Inquiry is a learning process that encourages learners to seek their own knowledge or solutions to problems, much like scientists do. According to Wiyanto (2008), inquiry learning is a method that facilitates learners to question why phenomena occur until they find the answer to the problem themselves. The advantages of this method can foster skepticism, objectivity, curiosity, critical thinking, creativity, problem solving, cooperation, communication, and the use of measuring instruments. Trowbridge et al. (1981) distinguish the inquiry strategy from the discovery strategy. Discovery is the mental process of assimilating concepts and principles. The process of Discovery includes observing, classifying, measuring, predicting, describing, and inferring. While inquiry is a process of uncovering and investigating problems, formulating hypotheses, designing experiments, collecting and analyzing data, and drawing conclusions.

The activity of the learner who discovers a concept independently leads to longer retention of learning and the hypothesis testing activity can eliminate doubts. However, the disadvantages are that it is inefficient for a large number of learners because it takes a long time and learners who are less skilled/inexperienced may have difficulty in finding the relationship between concepts which leads to frustration. This method also has drawbacks for some disciplines. For example in the field of natural science, there may be a lack of measurement /collection of data facilities needed to test hypotheses.

a. Preparation

- 1) Lecturers prepare a topic as a source of stimulus that arouses students' curiosity.

- 2) This method can be combined with the Small Group Discussion method, where the lecturer groups students into small groups of 5-10 members (can be done randomly or based on certain indicators).
- 3) Prepare stimulus keywords that help students to solve the problem.

b. Implementation

- 1) Groups of students are faced with a problem/phenomenon situation as a stimulus that arouses their curiosity.
- 2) Lecturers can convey the formulation of problems with hypotheses.
- 3) Students collect information or data to solve problems.
- 4) Students observe, measure, describe, process data, test, and conclude.
- 5) Lecturers facilitate students to solve problems (deliver stimulus) until they find the solution themselves.
- 6) Lecturers monitor student activities and conduct formative assessment using observation techniques and monitor student activities using analytic rubrics.

c. Conclusion

- 1) The results of lecturers' observations during class presentations and discussions, as outlined in the analytic rubric, can serve as feedback for students.
- 2) Students take an active role in class discussions and make improvements as necessary.

3.10. Self-Directed Learning (SDL)



Figure III.11 Illustration of the Self-Directed Learning Method

This learning method gives learners the opportunity to take the initiative without the help of others in diagnosing learning needs, formulating learning outcomes, identifying learning resources, selecting and implementing appropriate learning strategies, and evaluating them. Self-directed learning can be considered as part of the movement towards learner-centered learning that emphasizes increasing learner responsibility. The advantages of this method are that learners can learn according to their interests and talents, learn from various learning sources, especially the material of their specialization, and develop knowledge and skills comprehensively. However, the downside is that less active and slower learners may fall behind. Learners who do not recognize their potential and interests may also face difficulties in choosing materials.

a. Preparation

- 1) Lecturers determine learning outcomes.
- 2) Lecturers create a suitable environment for the learning process.
- 3) Lecturers present him/herself as an expert who excels in the material and leads students, as well as a mentor who directs and guides students.
- 4) Establish processes for self-assessment and student learning procedures.

b. Implementation

- 1) Lecturers convey learning outcomes.
- 2) Students identify learning outcomes.

- 3) Lecturers discuss with each student regarding to the thesis proposal, contract, or plan that has been prepared to fulfill the Learning Outcomes (LOs) and their individual goals.
- 4) Lecturers engage in discussions with each student about their prepared plans to achieve learning outcomes and individual goals.
- 5) Lecturers must carry out monitoring, namely equipping students with skills and experiences to fulfill learning outcomes, especially for students who have difficulties.

c. Conclusion

- 1) Lecturers conduct a student self-assessment process through evaluation and direction at the end (summative) using written test/presentation/report techniques.
- 2) Assessment of learning outcomes cannot be done simultaneously due to the diversity in each student's learning process.
- 3) Lecturers provide time to prepare evaluation and feedback for each student if the assessment is conducted in the middle of the learning process under certain conditions.

3.11. Contextual Instruction (CI)

Contextual learning is a method that helps learners understand what they are learning by connecting the study material with the context of their lives (Johnson, 2002). Furthermore, Johnson (2002) conveyed strategies for learning with contextual methods. including Relating, Experiencing, Applying, Cooperating, and Transferring (REACT).

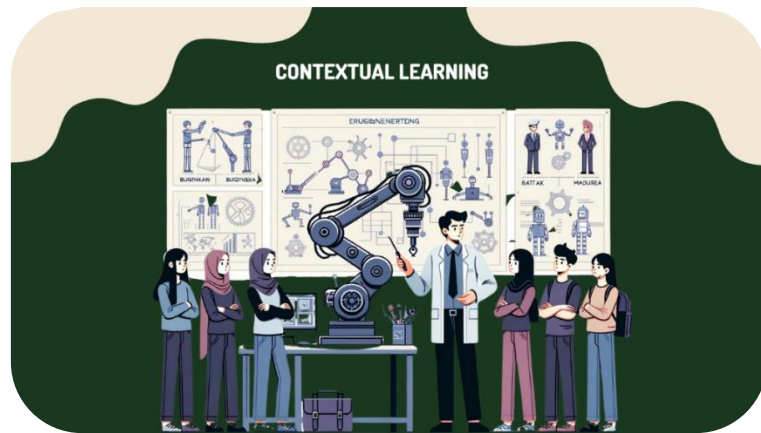


Figure III.12 Illustration of the Contextual Learning Method

a. Preparation

- 1) Lecturers need to find materials to be discussed by analyzing general information on the latest student developments.
- 2) Lecturers identify students' related experiences and knowledge, often expressed as apperception and preconceptions.
- 3) Lecturers can organize hands-on experiences in the classroom by preparing demonstrations/showing videos/other forms related to events/phenomena that exist in students' lives.

b. Implementation

- 1) After the lecturer produces the materials and informs the discussion topics, the students are tasked with connecting the new information with their life experiences or prior knowledge.
- 2) Lecturers should ensure the learning steps adopt the strategy of Relating, Experiencing, Applying, Cooperating, and Transferring (REACT), where;
- 3) Lecturers can also ask students to express opinions related to their experiences or conduct experience to prove through direct exploration and discovery.
- 4) Students apply the concepts they learn through problem-solving activities.
- 5) Lecturers guide and motivate students.
- 6) Students work together in groups to complete exercises or real-life experiences. Cooperation can include sharing, responding, and communicating.
- 7) As for problem solving, students divide the work in finding samples, determining test methods, and conducting tests to draw a conclusion.

- 8) Students connect new information with prior experiences/knowledge brought to class.

c. Conclusion

- 1) Lecturers provide opportunities for students to convey their experiences and new knowledge gained in class.
- 2) Lecturers and students discuss and summarize the findings obtained by each group into new knowledge obtained through the REACT strategy.
- 3) Lecturers conduct summative assessment using the final written exam technique or final presentation on the learning outcomes of each group using a holistic rubric.

3.12. Flipped Learning

The Flipped Learning method is different from traditional learning that takes the form of explaining the material in class meetings. In this method, the use of technology is highly emphasized to be used by learners in learning. In this method, the material will be studied in advance by the learners through references such as LMS, videos, or reading materials before the class meeting, so that the class meeting is utilized for discussion and clarification (FLN, 2014). Some other terms for this method are Flipped Classroom, Flipped Model, and Inverted Model.

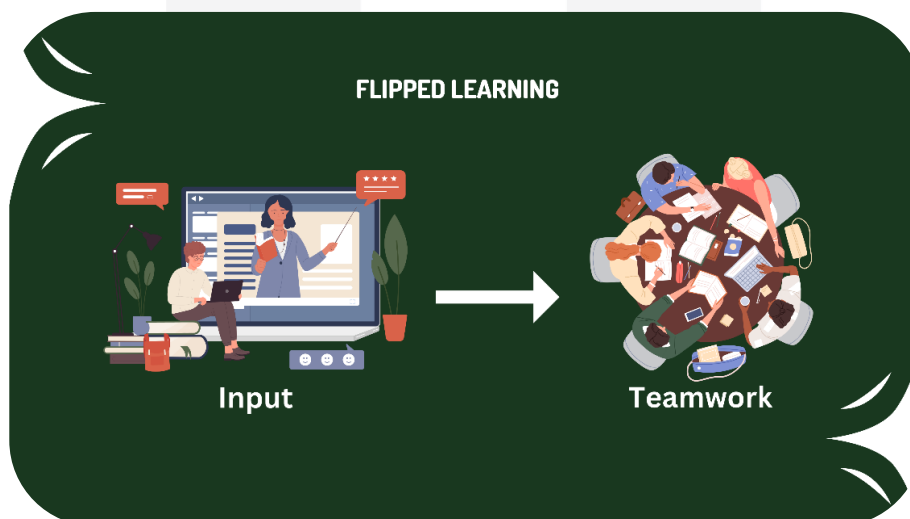


Figure III.13 Illustration of Flipped Learning

a. Preparation

- 1) Lecturers provide directions related to the material/problem/case to students through the LMS or in the form of learning videos prior to the class (can be done a week or a few days before class starts).
- 2) Students study the material as directed by the lecturer through the LMS, learning videos, and other reference sources.
- 3) According to the Bloom's Revised Taxonomy, the level of thinking at this stage is Remembering and Understanding.

b. Implementation (During Class Meeting)

- 1) Learners discuss the material/problem/case through Student-Centered Learning guided by the Learning Outcomes that have been determined so that they can understand the learning material.
- 2) Lecturers provide support in guiding students in classroom activities so that they apply learning materials.
- 3) According to Bloom's Revised Taxonomy, the thinking levels at this stage are Applying, Analyzing, Evaluating, and Creating.

c. Conclusion

- 1) Students consolidate their mastery of the material through follow-up assignments and prepare for the next material or even through presentations.
- 2) Lecturers can conduct summative assessment on mastery outcomes if the assessment technique used is project/presentation/final report using a holistic rubric. However, lecturers can also use the final written exam assessment technique.

3.13. Self-Paced Learning

This method is often known as Individualized Learning or Self-Instruction, which is a learning method where learners work at their own pace/rhythm. In this method, learners are actively involved in various assignments and activities, as well as learning experiences that contribute to the achievement of learning objectives. The success of this method depends on the success in conducting a thorough lesson plan that is in line with the learning objectives. In general, this method also requires an LMS to track the learning progress of

each learner. This method is also often part of a blended learning method. One of the online-based applications of Self-Paced Learning is Massive Open Online Courses (MOOCs).



Figure III.14 Illustration of the Self-Paced Learning Method

a. Preparation

- 1) Lecturers develop learning plans that include various activities tailored to the individual characteristics, preparation, needs, and interests of each student.
- 2) Lecturers prepare learning materials in the form of materials, videos, and other forms of reference.
- 3) Lecturers can prepare an analytic rubric as an assessment tool.

b. Implementation

- 1) Students learn at their own pace/rhythm using the LMS or materials prepared by the lecturer.
- 2) Students can conduct discussions offline or online with fellow students and lecturers.

c. Conclusion

- 1) Lecturers check/monitor student learning progress through the LMS
- 2) Lecturers conduct assessment and evaluation using formative methods related to the student learning process through quizzes or simple assignments

3.14. Informal Cooperative Learning



Figure III.15 Illustration of Informal Cooperative Learning

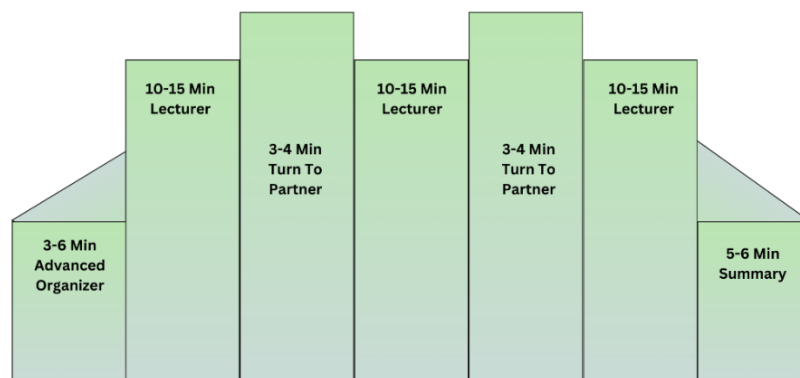


Figure III.16 Book-end Division

Adapted from CEE Book Series learning methods module: *Effective Implementation of Student Centred Learning, Part 1: Engaging Learners through Active Learning* (2016), which is an amalgamation of various research or reference journals, Informal Cooperative Learning (ICL) is an easy-to-implement method that can be applied to a variety of situations without the need for additional facilities and large moving spaces for learners. The advantage of this method is that it involves all learners. At the beginning of the activity, learners think independently and build their own ideas. Then, the ideas/thoughts are shared or discussed with fellow learners. Learners can also have open discussions with the whole class, supervised by the lecturer.

a. Preparation/Opening (Advanced Organizer)

- 1) Lecturer explains the purpose of the activity to ensure students understand what is required to benefit from it.
- 2) This activity lasts for 3-6 minutes with several choices of activities that can be done according to Canady and Rettig (2013) are:
 - i. Brainstorming, which is asking students individually, in pairs, or in groups to brainstorm a concept or problem. After that, randomly appoint one of the students to share their thoughts.
 - ii. Focus Listening, which is asking students to note down some important points related to concepts or problems for discussion and produce a new and better list. Then, ask students randomly to discuss their list with classmates.
 - iii. Opening Question is to ask an interesting and intriguing question related to the topic of the lesson to find the answer individually for 1 minute. The next 2 minutes provide an opportunity for students to discuss with their peers/close friends. Finally, the answers will be discussed with the whole class.
- 3) Another activity is Introductory Focused Discussion Pairs according to Johnson, Johnson and Smith (2006), in which students are asked to form pairs and are given a list of questions. Students will take turns answering the questions while their partner listens to their partner's answer. Then, a random member will be chosen to explain and share their knowledge with the class.

b. Implementation

- 1) Lecturers briefly present the topics studied for 10-15 minutes.
- 2) Then, students conduct discussions with fellow students for 3-5 minutes, with a choice of activities that can be done are:
 - i. Cooperative Notes Taking Pairs, where students are paired up to correct each other's notes. Students add information or correct inaccuracies to improve their notes.
 - ii. During a two-minute reflection or mirroring session, the lecturer asks students to consider the concepts and problems discussed, including their relevance to today's topic. The results will be shared with both peers and the entire class.

- iii. In-Class Teams, where each group is given time to collect answers from the following list: 1) Recalling previous material, 2) Answering questions, 3) Starting the solution of the problem, 4) Completing the steps in derivation, 5) Thinking of an example or application, 6) Finding out why the given result has a possible error, 7) Think of a question related to quality not quantity, 8) Generate questions, 9) Lecturer concludes.
- iv. Guided Reciprocal per Questioning, in which each student individually prepares 2 - 3 interesting questions on the given topic. Then, they take turns answering. Questions that do not yield satisfactory answers will be discussed in class.
- v. Think Aloud Pair Problem Solving (TAPPS), where each student in the group divides their roles as listeners and problem solvers. After 10 minutes, a collection of solutions from the listeners are discussed to reach a class consensus. Then the roles are swapped for other parts of the problem.
- vi. Pair Composition, where students work in pairs to complete a summary/article/magazine. Students write their own writing which is then discussed for mutual correction and suggestions for revision.
- vii. Think Pair Share (Johnson, Johnson, and Smith, 2006) is where individuals reflect on the topic being studied, such as thinking of answers or ideas which are then shared with their friends to discuss together.
- viii. Pair Testing (Black and William, 1998) where students take one or two courses' quizzes in pairs rather than individually. Lecturers can provide more difficult or challenging questions.
- ix. Note Checking (Johnson, Johnson and Smith, 1998), in which. students take individual notes from the *slide* or presentation, and the notes are then compared with the peer's. Notes are summarized to find the more important points and discussed with the whole class.
- x. Question And Answer Pair (Sasaki, 2005) is a question-and-answer activity in pairs.
- xi. Read and Explain Pairs (Johnson, Johnson and Smith 2006), where students are given a topic in pairs and read references to record an overview. These pairs are tasked with a role as summarizers and accuracy checkers, respectively, and then switch roles when moving to different sections/topics.

- 3) The lecturer pays attention to the students' discussion to recognize misunderstandings and correct them.
- 4) Lecturers ensure smooth and effective implementation of activities.
- 5) Lecturers provide additional insights for 10-15 minutes.
- 6) This activity is carried out repeatedly, alternating between delivery by lecturers and discussion among students.
- 7) During the implementation, lecturers can conduct formative assessment using observation techniques as outlined in the analytic rubric.

c. Conclusion

- 1) The lecturer provides a final summary and ensures that students understand what has been learned during the 5-minute in-class learning, through the following activities:
 - i. One Final Question (Shweta, 2011) is to create one question that can draw conclusions or topics being discussed.
 - ii. Two-minute Paper (Felder and Brent, 2005) is asking each student to write a 2-minute summary of the discussion which will then be shared briefly with the group or class.
 - iii. Closure Review Pairs (Johnson, Johnson, and Smith, 2006) where group representatives can present the conclusions of their discussion in front of the class.
 - iv. Turn to Neighbor Summaries, in which students individually formulate answers and questions that require summarizing the class material. Then share answers and reasons with classmates. This results in a new, improved answer. At the end, the lecturer helps the pairs and randomly asks the students to explain the answers together.

IV. ASSESSMENT TOOLS FOR LEARNER-CENTERED LEARNING

Assessment methods play a crucial role in measuring students' progress and achievements. The basis of learning evaluation to determine the assessment standards are 1) Cognitive/Knowledge, 2) Participatory Activity, and 3) Project Outcome. The application of this evaluation basis, particularly in collaborative and participatory learning, uses a minimum of 50% of a combination of participatory activities and project outcomes. This shows that in collaborative and participatory learning, assessment focuses on cognitive aspects and student participation and the outcomes of their cooperation.

There are two types of assessment often used in the learning process; formative and summative assessment. Formative assessment is a type of assessment carried out during the learning process, intended to provide feedback on the progress of learners as students and help students to continuously improve their skills and understanding. Meanwhile, summative assessment is carried out after the learning process is completed, aiming to measure students' final achievement in a material or curriculum. These two types of assessment have different but complementary roles in ensuring learning effectiveness. This section will describe how to apply formative and summative assessment methods and the assessment techniques that can support their application.

4.1 Formative Method

Formative methods aim to identify errors in the comprehension process and gaps during the learning process. This method helps improve students' understanding or skills during the learning process rather than providing a final assessment (Trumbull and Lash, 2023). Assessment techniques that can be executed for formative methods are observation, class discussion, self-assessment, peer assessment, simple written tests, periodic self-assignments, and surveys.

There are 7 (seven) principles adapted from Nicol and Macfarlane-Dick (2007) that can guide lecturer strategies:

- 1) Explain the criteria for a good assignment or work.
- 2) Encourage students to self-reflect.
- 3) Provide corrective, detailed and actionable feedback to students.

- 4) Foster communication between lecturers and fellow students about learning.
- 5) Provide positive motivation and confidence to students.
- 6) Provide opportunities to improve the task to meet expectations.
- 7) Gather information from students to improve the learning process.

The following details that can be executed to implement the formative assessment method:

a. Planning or Preparation

- 1) Lecturers plan clear learning objectives.
- 2) Lecturers must understand what students want to achieve in a particular lesson.
- 3) Lecturers develop assessment instruments that are in line with learning objectives.
It can be quizzes, open-ended questions, projects, observations, or other types of assessment, depending on the context and learning objectives.

b. Implementation

- 1) Lecturers give assignments or activities to students that are relevant to the material being taught. This assignment should be designed to measure students' understanding of the concept or skill being taught. Assignments can be in the form of projects, discussions, or presentations.
- 2) Lecturers collect performance data while students are working on tasks or activities. This data collection or portfolio can be done through direct observation, examination of students' work, or tools like questionnaires or worksheets.
- 3) Lecturers analyze the data collected to identify patterns or trends in students' understanding. By analyzing the data, lecturers can determine where students are struggling or succeeding.
- 4) Lecturers provide feedback based on data analysis. This feedback should be constructive and help students understand their strengths and weaknesses in learning.

c. Conclusion

- 1) Lecturers and students can take action based on the feedback provided. This could be the presentation of additional material, exercises, mentorship, or a change in teaching methods.

- 2) Lecturers continue to monitor students' progress over time and conduct additional assessments, if necessary.
- 3) Lecturers may revise lesson plans and objectives if data indicates that changes are needed. Formative assessment helps in adjusting instruction to ensure students achieve the expected understanding.
- 4) Lecturers and students can engage in joint reflection on the learning process. This can help in identifying effective teaching strategies and better understanding how students learn.

There are several other formative assessment techniques based on the book *Classroom Assessment Techniques* by Angelo and Cross (1993), namely:

- a. To assess prior knowledge, memory and understanding, techniques such as PreTest, Minute Paper (students answer 2 questions about the important things they have learned and what questions remain unclear to them), and Focused Listing can be used.
- b. To assess skills in analysis and critical thinking, Pro and Con Grid can be used (students make a list of advantages/disadvantages, pros/cons, etc.).
- c. To assess synthesis and creative thinking skills, Concept Maps can be used.
- d. To assess problem-solving skills can be done by identifying the main point in a problem.
- e. To assess skills in application and performance, it is possible to use Directed Paraphrasing, in which students retell a lesson to a specific audience and translate specific information into language that the audience can understand.
- f. To assess a student's self-awareness as a learner, it is possible to use Goal Ranking and Matching where students list and prioritize three to five goals that they must learn for themselves.
- g. To assess student reactions to class activities, assignments, and materials, Group Work Evaluation can be used, which involves filling out a short survey about the group's progress and making suggestions for group improvement.

For more comprehensive list of techniques, additional resources can be accessed at the following link: https://vcsa.ucsd.edu/files/assessment/resources/50_cats.pdf

4.2 Summative Method

Summative methods assess students' learning, knowledge, and skills at the end of a learning period, such as a course. This method usually performs assessments on a scheduled basis

and has a significant weight. Some of the assessment techniques that can be done for summative methods include final written/practical exams, final projects, portfolios, final presentations, work exhibitions, and final reports. To ensure that summative assessments are fit for the objectives, the following strategies can be considered:

- 1) Using rubrics or specification tables.
- 2) Design clear and effective questions.
- 3) Conduct overall assessment.
- 4) Clarify assessment parameters.
- 5) Consider anonymous assessment without student identification.

The following details the steps that can be taken to implement the summative assessment method:

a. Planning or Preparation

- 1) Lecturers plan clear learning objectives that are in line with the applicable curriculum/standards.
- 2) Lecturers must understand what students want to achieve in a particular lesson.
- 3) Lecturers develop assessment instruments that are in line with learning objectives. It can be quizzes, open-ended questions, projects, observations, or other types of assessment, depending on the context and learning objectives.
- 4) Lecturers determine the summative assessment schedule and inform students so that they can be well prepared.

b. Implementation

- 1) Lecturers collect assessment results in accordance with predetermined instructions.
- 2) Lecturers conduct analysis and assessment in accordance with a predetermined rubric or assessment criteria.

c. Conclusion

- 1) Lecturers report assessment results in the system to be received by students and parents.
- 2) Lecturers evaluate and reflect on the assessment process and results to consider the achievement of learning objectives and what needs to be improved in future learning.
- 3) Assessment results can be used to inform graduation or improvement of curriculum and teaching methods.

V. RUBRIC OF ASSESSMENT

Assessment is a process involving steps to identify, collect, and compile data and evidence necessary to evaluate students' development and achievement in relation to predetermined learning objectives. This evaluation involves aspects such as assessment principles, assessment methods and tools used, as well as assessment processes and procedures, assessment implementation, assessment results reporting, and determining student graduation. According to the guidebook for the preparation of higher education curriculum (2023), assessment should ideally be able to address important indicators related to honesty, discipline, communication, assertiveness, and self-confidence that must be possessed by students.

Several principles of assessment in accordance with SN-Dikti must broadly include the principles of (1) educative, where the assessment carried out must motivate students to be able to improve planning and learning methods and achieve predetermined learning outcomes, (2) authentic, which is an assessment oriented towards the continuous learning process and learning outcomes that reflect abilities during the learning process, (3) objective, which is an assessment based on standards agreed between lecturers and students and free from the influence of the subjectivity of the assessor and the assessed, (4) accountable, where the assessment is carried out in accordance with clear procedures and criteria, agreed at the beginning of the lecture, and understood by students, (5) transparent, where assessment procedures and results can be accessed by all stakeholders.

According to SN-Dikti, assessment of learning outcomes can be carried out in the realm of attitudes, skills, and knowledge in detail explained as follows:

- a. Assessment of the attitude domain is carried out through observation, self-assessment, assessment between students (students assess the performance of their colleagues in one field or group), and assessment of personal aspects that emphasize aspects of faith, noble character, confidence, discipline, and responsibility in interacting effectively with the social environment, the surrounding environment, and the world and its civilization.

- b. Assessment of the skills domain through performance assessment, which can be organized through practicum, practices, simulations, field practices, and others that allow students to improve their skills.
- c. Assessment of the knowledge domain through various forms of written and oral tests, which can technically be carried out directly or indirectly. Directly means that lecturers and students meet face-to-face during assessment, such as during seminars, thesis, and dissertation examinations. Meanwhile, indirectly, for example, uses sheets of written exam questions.

In the assessment process, an assessment instrument is needed to help in assessing or evaluating. The instrument can be an assessment rubric, which is a tool or guideline containing criteria used to assess or evaluate learning performance. The use of rubrics is helpful in increasing transparency and fairness in the assessment process. With the rubric, assessment becomes more structured and objective, because all parties involved have clear guidelines on what is assessed and how the assessment is carried out, meaning that the rubric clarifies the dimensions or aspects and levels of assessment of learning outcomes. In addition, rubrics also allow for consistency in assessment, so that multiple raters can reach greater agreement on assessment results.

5.1 Features on Rubric

According to Stevens & Levi (2013), rubrics should contain four important features:

- 1) A description of the tasks that students are expected to produce or perform.
- 2) A scale and scoring that describe the level of mastery. For example, level 1, level 2, level 3, and level 4 or exceeds expectations, meets expectations, and requires improvement.
- 3) Performance components/dimensions/attributes that students must pay attention to in completing assignment/work. For example, the types of skills, knowledge, and others used as assessment attributes.
- 4) A description of the performance/quality of performance of the components/dimensions at each level of mastery indicating the achievement criteria that must be achieved on the existing rating scale.

The following template rubric with four features is outlined in table V.1 below:

Table V.1. Rubric Format

Attribute/Scale	Excellent	Good	Adequate	Poor
Performance Attribute 1	Performance description	Performance description	Performance description	Performance description
Performance Attribute 2
Performance Attribute 3
....

Description:

Performance description : Description of performance quality.

Scale Example : - Excellent, good, adequate, poor.
- Highly skilled, skilled, intermediate, beginner.
- Exceeds expectations, meets expectations, requires improvement.

Performance attributes 1,2,3 : Examples are comprehension, grammar, strength of argumentation, task completion, etc.

5.2 Rubric Types

Rubrics can be comprehensive or general and can also be specific or only applicable to a specific topic. There are three kinds of rubrics (SN-Dikti, 2023) presented as examples in this book, namely:

- a. Holistic rubric is an assessment guideline for judging based on an overall impression or a combination of all criteria. This rubric is simpler to implement, and is more intuitive and efficient in determining grades. A limitation of this rubric is its inability to offer specific feedback to students for their improvement. In addition, this rubric is qualitative, so the assessment criteria for each score range need to be more detailed and clearer to better distinguish between the level of value and the score. The following examples of holistic rubric assessment guidelines are outlined in Table V.2.

Table V.2. Example of Holistic Rubric Assessment Guidelines

Grade Level	Score	Assessment Criteria
Poor	<20	The design is disorganized and does not solve the problem
Limited	21-40	The design is organized but does not sufficiently solve the problem
Adequate	41-60	The design presented is systematic, solves the problem, but is less implementable
Good	61-80	The design presented is systematic, problem-solving, implementable, but lacks innovative

Grade Level	Score	Assessment Criteria
Excellent	>81	The design presented is systematic, problem-solving, implementable, and innovative.

- b. An analytic rubric is a structured assessment tool that delineates levels of criteria along with corresponding scales or scores. This rubric serves to identify specific strengths and weaknesses of students, thereby enhancing the effectiveness of teaching and learning activities. Although in its creation, this type of rubric requires a significant amount of time and detailed, specific criteria. The advantage of using this rubric is that it allows the lecturer to give diagnostic/formative feedback. However, similar to the holistic rubric, this rubric type is qualitative, so the assessment criteria for each score range need to be more detailed and clearer to better distinguish between the level of value and the score.

Table V.3. Example of Analytic Rubric Assessment Guidelines

DIMENSION	Excellent	Good	Adequate	Limited	Poor
	Score ≥ 81	(61-80)	(41-60)	(21-40)	<20
Organization	Well organized by presenting facts supported by examples that have been analyzed according to concepts	Well organized and presents convincing facts to support conclusions.	The presentation has a focus and presents some evidence that supports conclusions	Fairly focused, but insufficient evidence for drawing conclusions	No clear organization. Facts are not used to support statements
Content	Content is able to inspire the audience to develop thoughts	Accurate and complete content. Audience gains new insights on the topic	Content is generally accurate, but incomplete. Audience may learn some implied facts, but does not gain new insights on the topic.	Less accurate content because there is no factual data, does not add to the audience's understanding	The content is inaccurate or too general. Audience learns nothing or is sometimes misled
Presentation Style	Speak with passion, transmitting passion and	Speaker is calm and uses proper intonation, speaks without	Speaker is generally calm, but with a flat tone and relies	Relies heavily on notes, no ideas developed outside the	Speaker is anxious and uncomfortable and reads notes instead of

DIMENSION	Excellent	Good	Adequate	Limited	Poor
	Score \geq 81	(61-80)	(41-60)	(21-40)	<20
	enthusiasm to the audience	relying on notes, and interacts intensively with the audience. The speaker always maintains eye contact with the audience	on notes quite often. Sometimes eye contact with the audience is neglected	notes, monotonous voice	speaking. Audience is often ignored. No eye contact as the speaker mostly looks at the whiteboard or screen

Another example:

Table V.4. Another Example of Analytic Rubric Assessment Guidelines

Assessment Criteria	Score 4	Score 3	Score 2	Score 1
Content	The paper is complete and covers all the required material.	The paper is complete, but some material is insufficiently covered.	The paper is incomplete, and some material is not covered.	The paper is very incomplete, and much material is not covered.
Structure	Paper has a clear and systematic structure.	Paper has a clear structure, but some parts are less systematic.	Paper lacks a clear structure and some parts are unsystematic.	Paper has no clear structure and all parts are unsystematic.
Language	Paper uses standardized, clear, and easy-to-understand language.	Paper uses standardized and understandable language, but some parts are less easy to understand.	Paper uses less standard and less understandable language, and some parts are difficult to understand.	Paper uses non-standard and unclear language, and all parts are hard to understand.

- c. A perception scale rubric is an assessment framework that consists of levels of criteria that are not explicitly defined, yet it provides a scale or score for evaluation.

Table V.5. Example of Perception Scale Rubric Assessment Guidelines

Aspects/Dimensions Assessed	Poor	Limited	Adequate	Good	Excellent
	<20	(21-40)	(41-60)	(61-80)	>80
Communication Skills					
Material Mastery					
Ability to handle questions					
Use of Presentation Props					
Accuracy in Problem Solving					

5.3 Rubric Development Mechanism

The mechanism for developing the assessment rubric provides the possibility to understand more deeply what is to be assessed and how the assessment will be conducted. This section will explain the general steps related to the rubric development mechanism that will help in creating assessment guidelines that are clear, consistent, and relevant to the learning outcomes. Here are the general steps in the rubric development mechanism:

- 1) Determine the expectations or outcomes of the assessment.
- 2) Identify the characteristics of student outcomes in terms of what students need to demonstrate. At this stage, the main performance criteria or aspects evaluated in the assessment are produced. For example: attitudes, knowledge, skills, analysis, behavior, and others.
- 3) Identify the level of mastery required. Outline the performance characteristics of each key performance criterion or aspect for each level of mastery and determine the score that should be allocated for each level.
- 4) Describe the performance characteristics of each key performance criterion or aspect for each level of mastery.
- 5) Develop rubrics with a clear hierarchy. Usually, the main criteria are placed at the top of the rubric, followed by sub-criteria or more detailed descriptions of success levels. In this section, terms can also be used to make the assessment easier, such as: "fulfills", "less fulfills" or "does not fulfill". The scoring terms used also need to be followed by the numerical scale given for grading.
- 6) Conducting Pilot test to the rubric with some sample papers. At this stage, it is essential to ensure that the rubric consistently provides assessment results that align with the assessment objectives.
- 7) Rubric implementation, where at this stage, both lecturers and students need to understand and apply the rubric in the same way. Lecturers can explain how to use rubrics. For each level of mastery, lecturers can provide one example explanation of the features that need to be present in students' work that reflect the assessment criteria. After this stage is done, the next step is to calibrate the assessment together with team teaching.

- 8) Provide 2 (two) examples of student performance/work that represent various levels of mastery (keep the levels secret). Then ask the team teaching to give an independent assessment using the rubric that has been developed.
- 9) Collect assessments from team teaching to show agreement in the assessment process.
- 10) Discuss discrepancies in assessment and the causes of different grading. Then, revise/clarify rubrics if needed.
- 11) Once agreement on the assessment and use of rubrics has been reached among all parties, individual assessment of overall student performance/work can be carried out.

5.4 References for Rubric Development

Some website platforms that provide rubric development references or rubric templates are: <http://rubistar.4teachers.org/index.php> and <https://www.aacu.org/initiatives/value-initiative/value-rubrics>

VI. LEARNING STRATEGIES FOR ONLINE CLASSES

The rapid development of Information and Communication Technology (ICT) in supporting the learning process provides various conveniences. This encourages various types of learning that can be executed without onsite or physical face-to-face meeting, allowing learning process to take place in online classes while still achieving learning objectives. Various learning methods will help students to stay motivated and engaged in the learning process, one of which is by utilizing technology. Technology can be a powerful tool to improve the effectiveness of online learning. Lecturers can use technology to present learning materials, facilitate discussions, and provide feedback to students. Here are some strategies that can be done in implementing some learning methods in the online classroom.

6.1 Class Meetings between Lecturers and Students

Online meeting, conducted synchronously or virtually between lecturers and students (VCON Class), can be executed by utilizing several available platforms, such as Microsoft Teams, Zoom Meeting, or Google Meet. Material delivery can be executed using the Share Screen feature available on the said platform to display slides or other files as needed, similar to using a whiteboard and projector in an offline class. Discussions can also be performed either utilizing voice or the chat feature available, allowing for interactive learning process.

In addition, Gaming platform such as [roblox.com](https://www.roblox.com) is possible to be utilized as a learning process platform. Lecturers and students can experience a diverse and interesting world, because it is plausible to create a learning environment/atmosphere as desired, even though it is still based on video conference. Similar platforms that can also be used in the learning process are gather.town, kumospace.com, and so on.

Furthermore, it is possible to have interactions like offline meetings between lecturers and students using Virtual Reality (VR) technology. This technology can create a fully digital environment that replaces the real world, so that students can experience interacting with a live classroom environment, even if only virtually.

6.2 Group Discussions

In some of the learner-centered learning methods previously discussed, there are group discussion activities in both assignment work, problem-solving, and case studies. This

activity can be done using the Breakout Room feature on Microsoft Teams, Zoom Meeting, or Google Meet.



Figure VI.1 Platform for Discussion

Each group can be assigned to a different Breakout Room so that discussions can be held separately from one group to another. Lecturers can join each breakout room in turn as if visiting each group to monitor the discussion in the offline class. During the group discussion, students can utilize various platforms as needed, namely:

- a) Create presentation slides online using Microsoft PowerPoint, Google Slides, Canva, Prezi, Visme, and others.
- b) Conduct brainstorming and mind-mapping online using Miro, Milanote, Mural, Stormboard, and others.



Figure VI.2 Platform for Creating Slides



Figure VI.3 Platform for Brainstorming

Once the discussion has been completed, students can rejoin the main room for class discussion.

In the virtual world, there are many other tools that can be utilized for learning process activities, one of which is using gaming platforms such as Roblox games or simulation websites such as gather.town and kumospace.com. With these gaming platforms, lecturers and students can work together to organize games specifically for group discussion. This feature helps students understand lessons more easily because they are learning from textbooks or orally and through simulations. This method involves using models or mock situations to illustrate real-world situations. Through simulation, students can learn in a more effective and interactive way and can develop skills and a deeper understanding of the concepts being studied. The simulation method utilizing a gaming platform or a website for group discussion has many benefits, among others:

- a) Improve understanding of abstract concepts.
- b) Developing critical thinking and problem-solving skills.
- c) Developing cooperation skills.
- d) Increase motivation and interest in learning.

6.3 Assignment Submission

Assignment submission activities are usually centralized to the lecturer, with a space provided on the LMS (CeLOE) so that students or groups can submit according to instructions from the lecturer. However, there are other platforms that lecturers can utilize, such as OneDrive and Google Drive. To keep assignments confidential between students or groups, Microsoft Form or Google Form features can also be used so that only the lecturer can see the entire assignment results.

6.4 Online Quizzes or Exams

Conducting quizzes and written exams without students coming in person can still be done through several platforms and strategies. Generally, this activity can be carried out through the LMS. Lecturers will prepare question and answer materials, and then students can work independently on these questions according to a predetermined time and duration through the internet network. Other platforms that can be used are Microsoft Form, Google Form, Quizizz, Kahoot, Edmodo, YouTube communities, and others. Meanwhile, to prevent cheating during the online exam, here are some things that can be done by lecturers:

- 1) Reinforce the prohibition and consequences of cheating or disqualifying offenses as a warning about exam integrity to students.

- 2) Design a better exam structure by creating a variety of questions such as multiple choices, essays, and other applicative questions to make it difficult for students to copy answers.
- 3) Organize randomized questions or answer choices to avoid students getting the same question.
- 4) Set the duration of the work to reduce the chance of students looking for answers outside the exam.
- 5) Monitor participants' activities through video from both students' laptop camera and an additional camera positioned differently from the laptop camera to prevent cheating by consulting with others or opening notebooks.
- 6) Use a platform such as Safe Exam Browser or others that can limit the use of computers/laptops from opening other browsers to avoid cheating in finding answer references.
- 7) Checking plagiarism of student assignments using iThenticate and Turnitin. These platforms can check the similarity between participants' answers and online sources.

VII. LEARNING METHOD SELECTION STRATEGY

A good curriculum supported by adequate facilities and infrastructure may not produce the expected results if lecturers do not choose and apply appropriate learning methods. This indicates that the selection of learning methods is a crucial factor in achieving successful learning outcomes. Therefore, lecturers have the responsibility to master the strategy of selecting appropriate learning methods and to apply them consistently. There is a wide selection of learner-centered learning methods, such as group discussions, role-playing, case-based learning, project-based learning, and many others, as described in Chapter III.

In general, learning methods can be interpreted as a means to achieve learning outcomes or learning objectives. Thus, the determination of learning methods should be influenced by the type of learning objectives expected (Bonner, 1999). In accordance with this, Biggs (Biggs, 1996) concluded that the selection and application of learning methods should be focused on achieving learning outcomes. In addition to considering the suitability of learning methods with learning objectives (LOs), factors such as the characteristics of teaching materials, learner profiles, availability of resources, and learning environment conditions also need to be considered (Shailaja (2017) and Taylor et al. (2013)).

7.1 Alignment with Learning Outcomes (LOs)

Alignment between learning methods and learning outcomes is the foundation of effective education. When designing learning experiences, it is crucial to ensure that the methods chosen are not only appropriate to the learning objectives that have been set, but are also capable of activating the process of understanding, mastering skills, and achieving expected outcomes. By carefully considering how learning methods will support learning outcomes, it can create a learning environment that enables students to reach their full potential, encourages intrinsic motivation, and promotes deep understanding.

According to Biggs (1996), to facilitate students in achieving learning outcomes, it is recommended that there is harmony between learning outcomes, learning methods or processes, and assessment. Figure IV.1 shows the operational framework of Biggs' constructive alignment model (in Alfauzan & Tarchouna, 2017).



Figure VII.1 Operational Framework of Constructive Alignment Model.

Biggs (1996) found that students tend to only learn about what will be tested. As a result, orientation in learning depends on assessment. What should be the guideline is the curriculum. This will not be a problem if the assessment is in line with the curriculum or if the assessment is aligned with the formulated learning outcomes.

Table VII.1 Alignment Mapping Between Learning Outcomes, Assessments, and Methods

LO	Assessment Form	Learning Process	
		Learning Activities	Methods Learning
Attitude			
Knowledge			
Skills			

Therefore, the alignment between student outcomes, assessment, and learning methods needs to be considered, so that students will learn what they need to learn to achieve learning outcomes. One way to check the alignment is through the mapping table as shown in Table VII.1.

7.2 Characteristics of Teaching Materials

The characteristics of teaching materials are essential in achieving the desired learning outcomes. Teaching materials must be carefully designed to match the level of

understanding and skills that students want to achieve. The richness and relevance of the content, clear presentation, and level of difficulty appropriate to the stage of learning are important aspects that must be considered. In addition, teaching materials also need to be designed to motivate students to learn, relate concepts to real-world situations, and provide opportunities to practice and apply the knowledge and skills learned. By paying attention to the characteristics of appropriate teaching materials, it can increase the chances of students to achieve learning outcomes effectively. The teaching material consists of 1) Facts, 2) Concepts, 3) Principles, and 4) Procedures. While related to the characteristics of teaching materials, among others:

- a) The characteristics of each course are different, including between topics of the same course.
- b) The level of difficulty or complexity of the teaching material varies because it depends on the success of the learning method applied.

7.3 Characteristics of Students

According to Wright (2011), in student-centered learning, the responsibility for learning is on the students themselves. However, students vary in their characteristics, such as gender, age, socio-economic background, learning experience, and psychological development. These differences in characteristics must be considered in choosing learning methods and managing their implementation. This action is needed to ensure that learning goes according to plan, with all students actively involved, and to prevent learning from being dominated by only a few students. In addition, each student has a different learning style, level of prior knowledge, interest/motivation, cognitive ability, personality, and background. It is important for educators to recognize this uniqueness and design responsive learning experiences. This can involve differentiating instruction, additional support for students who need it, and providing motivating feedback. In addition, understanding students' individual learning styles and learning preferences can help in the selection of the most effective teaching methods. By carefully considering student characteristics, it can help each student reach their best potential in achieving the learning outcomes that have been set.

7.4 Resource Availability

Resource availability plays a key role in achieving effective learning. Resources include accessible textbooks, laboratories, classroom facilities, software, internet access, practicum-

assisting systems, technicians, and other resources. The availability of adequate resources allows both students and lecturers to access the information and tools needed to understand concepts and develop skills. When the necessary resources are unavailable or limited, this can be a serious obstacle in achieving optimal learning outcomes.

Another crucial resource is space or buildings. When learners feel comfortable, safe, and supported in the classroom, they are more likely to engage in learning and more open to active participation. An atmosphere that promotes open communication, collaboration and acceptance of diverse perspectives can enhance learners' understanding of the subject matter. The room concept or physical layout of the classroom also significantly impacts learning outcomes. An efficient and ergonomic layout can create an environment that facilitates learning. A well-organized room can provide easy access to necessary learning materials, technology, and resources. In addition, a layout that supports collaboration, interaction, and discussion between students and instructors can improve concept understanding. By designing classrooms that support active and interactive learning, it can increase learners' chances of achieving the desired learning outcomes.

Here are some room concepts that support learner-centered learning:

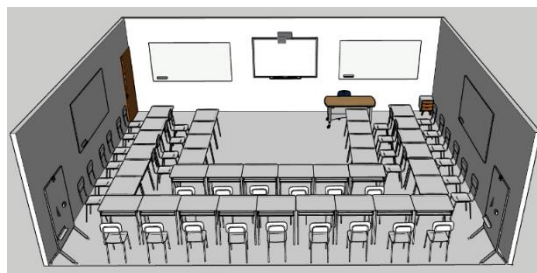


Figure VII.1. Room Concept A

Table VII.2 Concept Detail for Room A

Room Size	9.6 x 8 meters
Example of a Lecture Hall	TULT and Bldg. PSAL
Number of Students	35 students
Facilities and Tools	<ol style="list-style-type: none"> 1. 1 Lecturer Chairs and Desks 2. 35 Student Chairs and Tables 3. 2 Flip Charts 4. Sticky Notes 5. Colored Markers 6. Opaque Paper 7. 1 Projector 8. Whiteboard Attached to Classroom Wall

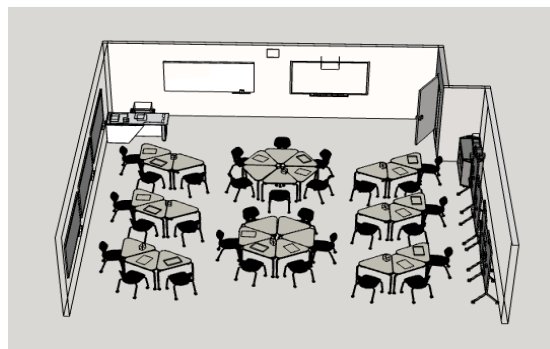


Figure VII.2. Room Concept B

Table VII.3 Concept Detail for Room B

Room Size	8 x 8 meters or 10.2 x 10.2 meters
Example of a lecture hall	Bldg. Cacuk A/B and Bldg. Tokong Nanas
Number of Students	28 students
Facilities and Tools	<ol style="list-style-type: none"> 1. 1 Lecturer Chairs and Desks 2. 28 Student Chairs and Tables 3. 4 Flip Charts 4. Sticky Notes 5. Colored Markers 6. Opaque Paper 7. Projector 8. Whiteboard Attached to Classroom Wall

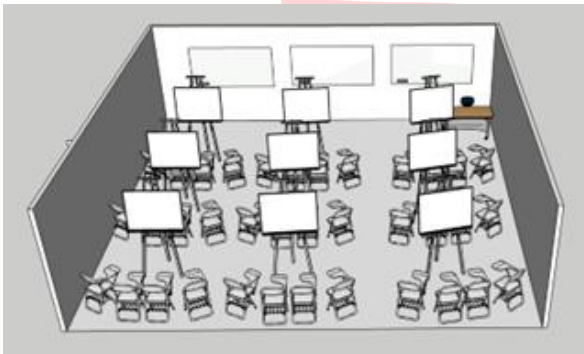


Figure VII.2. Room Concept C

Table VII.4 Concept Detail for Room C

Room Size	8 x 8 meters or 10.2 x 10.2 meters
Lecture Hall	Bldg. Cacuk A/B and Bldg. Tokong Nanas
Number of Students	45 students
Facilities and Tools	<ol style="list-style-type: none"> 1. 1 Lecturer Chairs and Desks 2. 40 Student Chairs and Tables 3. 1 Large smartboard 4. Sticky Notes 5. Colored Markers 6. Opaque Paper 7. Whiteboard Attached to Classroom Wall

Table VII.5 Concept Details for Room D

Room Size	8 meters x 8 meters
Number of Students	30 - 35 students
Facilities and Tools	<ol style="list-style-type: none"> 1. 1 Lecturer Chairs and Desks 2. 30 Student Chairs and Tables 3. 4 Flip Charts 4. 2 Smartboards 5. Sticky Notes 6. Colored Markers 7. Opaque Paper 8. Projector 9. Whiteboard Attached to Classroom Wall

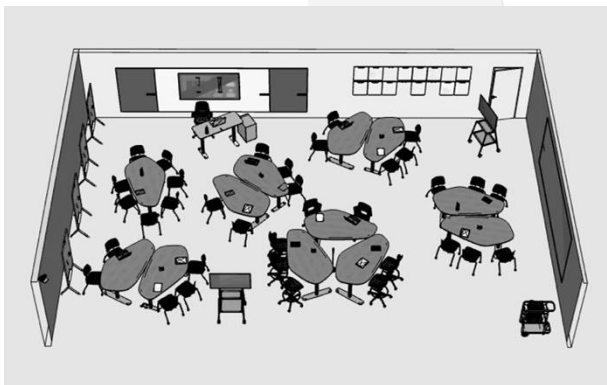


Figure VII.3. Room Concept D

Another resource is to optimize the management of appropriate technology, such as providing Wi-Fi as a facility to access reference sources and can utilize platforms or other

applications supporting discussions and learning activities such as Miro, Twine, and Padlet, which function to map ideas or share tasks together.

7.5 Learning Environment

Learning success can be influenced by the conditions or environment in which the learning activity takes place. For example, compared to classroom learning activities, laboratory activities are less formal; learners are free to observe, act, and interact individually or in groups. In addition, an environment that promotes cooperation, collaboration, and positive interactions between learners and instructors can enhance concept understanding and social skill development. It is also important to ensure that the learning environment supports learners' psychological safety and comfort, allowing learners to feel free to raise questions, argue, and experiment without fear of negative judgment. By creating a supportive learning environment, it can help learners achieve better learning outcomes, encourage intrinsic motivation, and facilitate deep understanding.

Therefore, the selection and application of learning methods must pay attention to the situation and conditions of the learning environment and vice versa. If a lecturer plans to apply a learning method, then they must create a conducive learning environment that supports the method. This will increase interaction between students and students, students and lecturers, as well as between students and learning resources, both offline and online. In order for the interaction in learning to run well, it is also necessary to pay attention to the number of students in the class or group.

IV. IMPLEMENTATION OF LEARNING METHODS

One of the implementations of the learner-centered learning method has been carried out by a group of lecturers through a project-based learning model development program for compulsory courses in the higher education curriculum organized by the Directorate of Learning and Student Affairs, Directorate General of Higher Education, Research and Technology, Ministry of Education, Culture, Research and Technology. The innovation is through combining and adjusting several learning methods called Digital-Based Collaborative Active Learning to Meaningful Education (CAL-CreateMe). This approach is done through combining the learning methods of Self-Directed Learning and Project-Based learning. Here, brainstorming or finding and determining problems is done collaboratively by groups of students while still in accordance with learning outcomes. Then, students in groups produce a solution in the form of work or product.

This implementation focuses on solving problems and developing solutions in a real, applicable, and quality manner. It encourages and facilitates students through active learning, develops high-level order thinking skills (HOTS), develops collaboration skills, bridges the gap between theory-practice and academia-workplace and can improve students' skills in applying the noble values promoted according to the learning topic into real life. The following are the stages of implementing project-based learning with the Digital-Based Collaborative Active Learning to Meaningful Education (CAL-CreateMe) approach, which in this case is applied to a compulsory curriculum course that focuses on Sustainable Development Goals (SDGs):

Table IV.1. Stages of Implementation (CAL-CreateMe)

<u>Preparation</u>	:	Lecturers convey learning outcomes and establish processes for self-assessment and student learning procedures.
<u>Stage 1</u> Problem Identification	:	Students are formed into groups, then identify problems based on Sustainable Development Goals (SDGs) in accordance with Course Learning Outcome 1.

<p><u>Stage 2</u> Problem Selection</p>	<p>:</p>	<p>Students determine the focus of the problem based on the Sustainable Development Goals (SDGs) in accordance with Course Learning Outcome 1. Lecturers conduct monitoring by providing students with skills and experience to fulfill learning outcomes, especially for students who experience difficulties.</p>
<p><u>Stage 3</u> Data and Information Collection</p>	<p>:</p>	<p>Students collect data and information in the field in accordance with Course Learning Outcome 1.</p>
<p><u>Stage 4</u> Portfolio or Work Development</p>	<p>:</p>	<p>Students develop a portfolio or body of work. This can be in the form of a report, presentation, or product that demonstrates the solution found in accordance with Course Learning Outcome 2. Lecturers monitor the students' project completion, both the activity and the quality of the project products according to the set standards.</p>
<p><u>Stage 5</u> Showcase</p>	<p>:</p>	<p>Each group will do a presentation or demonstrate their portfolio/work. These presentations can be in the form of an oral, poster, or video presentation in accordance with Course Learning Outcome 2. Lecturers conduct the student self-assessment process through evaluation and direction and provide feedback.</p>
<p><u>Stage 6</u> Reflection</p>	<p>:</p>	<p>Students reflect to evaluate the learning experience. This is done by evaluating what has been learned and finding out how this learning experience can help students in the future according to Course Learning Outcome 3.</p>
<p><u>Stage 7</u> Follow-up</p>	<p>:</p>	<p>Students conduct follow-up or recap based on the results of the presentation and reflection. Thing that needs to be done is to perform the work in real time, determine the next steps that need to be taken to improve the work or develop innovative ideas in accordance with Course Learning Outcome 3.</p>

V. CLOSING

Learner-centered learning is one of the learning approaches mentioned in Regulation of the Minister of Education and Culture (Permendikbud) No. 3 of 2020 on National Higher Education Standards (SN-Dikti). The approach states that learning outcomes (LOs) are achieved through a learning process that prioritizes the development of learners' creativity, capacity, personality, and needs, and develops independence in seeking and discovering knowledge. A variety of Active Learning methods that can be used to support learning include Case Based Learning, Collaborative Learning, Cooperative Learning, Project Based Learning, Problem Based Learning, and others, which support the achievement of learners' abilities in High Order Thinking such as complex problem-solving skills, critical thinking, creative thinking, communication, collaboration, and empathy.

The selection of various learning methods is highly dependent on the characteristics of the learning material, curriculum, learning resources, learning environment, as well as the conditions of lecturers and students. On the other hand, various technological developments and changes in the workplace demands have encouraged lecturers to continue to develop themselves in order to conduct appropriate learning. The application of appropriate methods is expected to support the improvement of learning quality and effectiveness for students in meeting course learning outcomes. This guidebook is arranged systematically and structured so that it is expected to be one of the guides for lecturers in understanding various learning methods including forms of evaluation and the use of ICT needed in designing the learning process of the courses taught.

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