Design of Experiential Learning Cycle to Develop Students' Self-Regulated Learning

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ABSTRACT
There is no learning without action and no responsible action without learning, it must be admitted that this can become a foundation. The concept of learning according to a behavioristic view is interpreted as the process of sending knowledge or transferring messages from experts to novices. Knowledge results from the interaction between theory and experience: "Learning is a process by which knowledge is created through the transformation of experience". Self-regulated learning is a predictor or determinant of student academic achievement in a learning environment. In the Experiential Learning Cycle (ELC) Kolb revealed that students must get a complete and comprehensive learning experience through four stages that must be done, namely real experience, reflective observation, abstract conceptualization, and active experiments.

Keywords: learning, self-regulated learning, experiential cycle

1. INTRODUCTION

There is no learning without action and no responsible action without learning, it must be admitted that this can become a foundation. Learning is part of the job and the job involves learning [1]. These are not separate functions but are interrelated. We have entered the Age of Knowledge, and the thing that applies the most is learning. Learning is not just knowledge itself; it is very important to understand. Knowledge is the result of learning and is temporary in nature, it needs to be updated and revised simultaneously.

The concept of learning according to a behavioristic view is interpreted as the process of sending knowledge or transferring messages from experts to novices [2]. Based on this view, the learner's role is to convey as much information as possible to the learner. There are a number of other factors that also affect the quality of learning besides the learning strategy factor. One of the factors referred to is the learning conditions. [3] Suggests learning conditions as follows: "Instructional conditions are defined as factors that influence the effects of methods and are therefore important for prescribing methods. Hence, conditions are variables that both (1) interact with methods to influence their relative effectiveness and (2) cannot be manipulated in a given situation. "[4] Classifying there are three groups of learning conditions as a variable, namely: (1) characteristics and objectives of the field of study, (2) constraints of the field of study, and (3) characteristics of learners which are aspects or qualities of individual learners (learning), such as interest. , talent, goal orientation, motivation, self-management in learning, cognitive style, intelligence, learning outcomes that have been owned, and so on.

Kolb suggest [5], [6], one of the learning outcomes is knowledge, and this is from the interaction between theory and experience: "Learning is a process in which knowledge is created through the transformation of experience". This direct experiential interaction in learning requires the active involvement of learners as opposed to passive involvement which is generally associated with teacher-directed learning [7]. At the Kolb Experiential Learning Cycle (ELC)[6], [8], the learning stages can be divided into four stages, see Figure 1.

Kolb provides advice for complex learning experiences, learners to go through the Figure 1 describes the four stages of the learning cycle. These four steps not only permit learners to explore a topic comprehensively through a variety of teaching and learning activities and perspectives. They apply various learning models to accommodate different learning styles for each learner. In this learning style is the treatment of two pairs of variables, namely doing vs watching, and thinking vs feeling. At each stage in the Kolb ELC can be broken down into these variables (Figure 1). every learner has a preferred learning style, but every learner responds

differently, and requires a stimulus from different learning instructions, each type of learning style has certain limitations [9]. ELC Kolb provides a complex opportunity to complete the stages of learning activities for each learning style, there is one special stage that allows it to suit one's learning style preferences [10].

Kolb's ELC is often used in analyzing the different learning styles of various classes of students in literature studies [11]. The Kolb ELC application can take several weeks to complete a learning ability enhancement process that is often discussed in the context of field case studies or training projects [7], [12]. Only a small number of authors recommend using the Kolb ELC to enhance classroom activities [1]. Kolb's ELC recommendation as a framework for designing group of learner's activities, and also provide examples of learning activities that can support the various stages of ELC in various fields.

For examples of active learning strategies is combine the four stages of Kolb's ELC to enhance the learning process for learners activity [13]. Focus about problem of low learning outcomes from Engineering laboratories class [14] using the Kolb ELC to implement a combination of remote, virtual, and hands-on lab sessions. Their activities focus on the prehension, or dimension of understanding knowledge, of ELC Kolb, where knowledge can be understood through concrete experiences, abstract conceptualization, or a combination of both [14]. Ineffective stress dimension activation can result in low knowledge retention from practical classroom sessions in the laboratory.

In this case, the dimensions are very important to be discussed. Before carrying out the transformation steps, more detailed information needs to be explained. This is done to build new knowledge that builds on existing knowledge. In their study [14] reported that including a virtual pre-lab session focusing on the prevention dimensions of the Kolb model improved student learning outcomes. In a recent study,[15] Empirical evidence is used to add to the other benefits of instructional design in engineering laboratory classroom activities based on Kolb's ELC. [16] Also reports that providing industrial engineering learners with a balanced learning experience, spanning ELC Kolb has 4 steps that have led to a deeper and more detailed learning process resulting in longer material retention.

Kolb's ELC approach has similarities with other active learning approaches [17]. The main thing that distinguishes it from other active learning approaches is, in ELC Kolb places experience as a foundation in the learning process (Figure 1). One of the characteristics of learners (learners) that need to be known and considered in learning is self-management in learning (self-regulated learning). Self-regulated learning is a predictor or determinant of student academic achievement in a learning environment [18], [19]. The learning environment demands a higher level of interaction between peers and cooperation, which asks students to be more proactive and requires self-regulation of learners, this is due to a lack of support from teachers, so Self-regulated learning is very important in the learning environment [20]. Self-regulated learning requires learners to be able to direct and regulate themselves, to be able to control and adjust themselves in relation to the tasks they face so that their learning outcomes can increase [21].

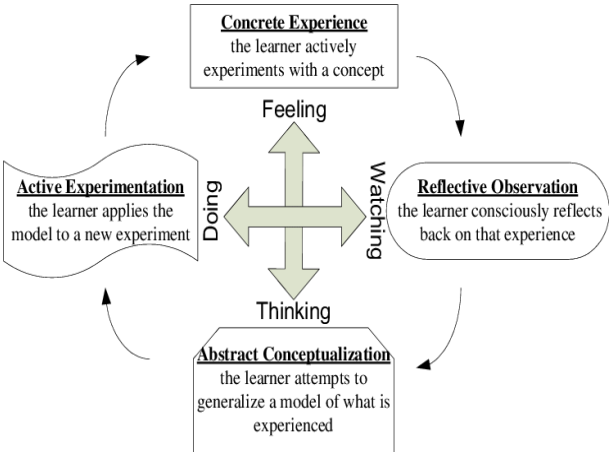

Figure 1 Kolb Experiential Learning Cycle (ELC)

Self-regulated learning (SRL) can be used by students as an encouragement to manage their own learning activities. On the other hand, some lecturers / teachers use self-regulated learning as a strategy or learning model to improve the quality of learning they manage.

Self-regulated is the ability to plan, organize, direct, control, and monitor behavior by involving motivational, cognitive, physical, emotional, and social elements to achieve certain goals using certain strategies. [22] states that in addition to external aspects, learning is also controlled by internal (self-regulated) aspects. Learning is defined as an active, constructive and self-regulated process [23]. So that the learner will get good learning results, if he realizes, is responsible.

Self-regulated learning this is defined as the learner's ability to independently and proactively be involved in motivating themselves and regulating behavior that can increase the achievement of goals [24]. SRL is a learner's activity in setting and monitoring their learning goals, controlling and regulating their motivation, cognition and behavior to suit their own goals and conditions which are carried out actively and constructively [23]. Zimmerman [25] states that there are 3 aspects (meta cognitive, motivation, and active behavior) will be formed from self-regulated learning. Find out more Bandura & Schunk [25] based on the social cognitive point of view states that self-observation, goals, self-reactions and self-decisions are something that underlies self-regulation. SRL learners in the form of motivation, method, and time which are the unity of personality to achieve their learning goals [26].

Table 1 Dimension of Academic Self-Regulation

Scientific Questions	Psychological Dimensions	Task Conditions	Self-Regulatory Attributes	Self-Regulatory Attributes
Why?	Motive	Choose to participate	Self-motivated	Goal setting
Where?	Physical Environment	Choose setting	Environmentally sensitive and full resource	Structuring environment
How?	Method	Choose method	Planned	Task strategies
When?	Time	Choose time limit	Timely and efficient	Time management
With Whom?	Social	Chose partner, model, or teacher	Socially sensitive	Help seeking

Students with high SRL have the following characteristics: (1) mastering the use of cognitive strategies (repetition, elaboration, and organization) well, (2) able to plan, control, and manage their mental processes in achieving their goals (metacognition); (3) have high motivation (motivational beliefs), self-confidence, positive emotions (happy, satisfied, and high enthusiasm); (4) able to plan and control efforts and time to complete assignments, know how to create and find suitable learning environments, and overcome difficulties by seeking help (help-seeking) from lecturers / friends; and (5) shows the maximum efforts in completing lecture assignments and creating a conducive classroom atmosphere [26]. Schunk [26] explained that Self-regulated Learning (SRL) has 6 self-regulatory processes, namely: (1) goal setting, (2) environment structuring, (3) task strategies, (4) time management, (5) help seeking, and (6) self-evaluation (Table 1).

2. THEORETICAL STUDY AND DESIGN

To improve independent learning and student learning outcomes, we created an active learning plan based on the results of previously collected data. Some activities went well, as expected, such as excellent student feedback responses. However, some activities did not achieve the expected results. Such as classroom observations and feedback from isolated students. This is because students do not understand the basic concepts of learning activities carried out.

This research shows results [14], [15] technical activities related to laboratories, learning sessions in the form of practice change to follow laboratory algorithms that are carried out manually in constructing knowledge into an activity in active learning. Active learning begins with the introduction of instructional instructions which contain steps that must be taken by students. Then given a challenging task to create an independent learning process and improve student learning outcomes.

In the case of ELC Kolb, these activities were initially based on stage (i) - Concrete Experience. The process of learning activities begins with understanding the concept. Students understand the theory as a form of self-confidence regarding psychological problems. Then students discuss and share the knowledge that each student has which is explained in their language. Furthermore, their partners provide feedback as a form of implementing regulations on individuals. Some learning can occur with steps in stage (i), when the learner is actively discussing. However, it is questionable whether they fully understand what they have done or whether they are able to extend what they have learned into different situations.

Through the Kolb learning model makes students more comprehensive from the learning sequence that is passed rather than just getting one perspective. [1]. With this potential, we decided to apply the Kolb ELC model to direct learning activities in the classroom. The steps in the Kolb pilot ELC learning are enhanced. ELC Kolb consists of 4 stages, this is one of the challenges that these four stages must be packaged in learning activities in lecture hours of about 30-90 minutes. Using this learning model, the learning design is made collaborative with group work activities that carry out the stages of reflective observation and abstract conceptualization. In the selection of other learning activities carried out as described by [1].

- **Real Experience**

Through assignments done by students, students get practical experience directly or real. Concrete experiences relate to a series of instructions containing steps that ultimately show a new subject or concept that was originally designed in instructional learning design. The series of activities that have been designed are followed one by one by students, it aims to form learning about self-management in learning. Even though students do not have previous experience, with descriptive instructions for beginners so that even beginners can still complete the specified learning activities.

- **Reflective Observation**

Discussion learning activities are designed to reflect on the experiences gained by students during direct practice. This is realized through a strategy that divides activities into small components to be more specific and include reflective activities in each of these sections. The learning process with a strategy like this really helps the instructor in the activity stages in the group. In the illustrative example, after completing the first section, students are asked to analyze the understanding components of previous experiences and discuss questions such as why they should explore their personal abilities. Reflective observation activities must foster learner-to-learner interactions to achieve higher levels of reflection.

- **Abstract Conceptualization**

When students do their assignments, they are expected to be able to make theoretical models and generalization of knowledge obtained through abstract conceptualization. To make this happen, it can be done with class discussions or peer-to-peer to share learning experiences and then generalize. Because it will be very difficult to achieve if done through short and direct activities. In an illustrative example, students are asked to make an understanding of the definition using their own language based on their understanding. Following this question, an instructor-led class discussion can help learners strengthen the picture of the definition according to experts. Another useful strategy is the use of generalization questions.

- **Active Experiment**

This is the next stage where students prepare to plan and do other new experiences firsthand. Two strategies are used here, the first is to assign new assignments to students. Although the tasks given are similar to the skills performed in the previous stage. The difference lies in the guidance, at this stage students are not given instructions about the steps in carrying out the assignment. For example, students are asked to describe the results of their understanding of their knowledge to students other than their teammates. At this stage they must complete the assigned task without any detailed implementation instructions. Then the second strategy is to build new topics by combining several related topics.

3. CONCLUSION

Experience and theory that interact with each other can produce knowledge: "Learning is a process by which knowledge is created through the transformation of experience". Kolb said students must go through four stages of the learning cycle, namely real experiences, reflective observation, abstract conceptualization, and active experiments to get a complete learning experience.

Self-regulated learning is a predictor or determinant of student academic achievement in a learning environment. Self-regulated learning (SRL) can be used by students as encouragement to manage their own learning activities. Self-regulated Learning (SRL) has 6 self-regulatory processes, namely: (1) goal setting, (2) environment structuring, (3) task strategies, (4) time management, (5) help seeking, and (6) self-evaluation.

In terms of using learning syntax, Kolb's Experiential Learning Cycle approach is used to develop Student Self-Regulated Learning. The learning design that will be carried out is to strengthen students in increasing individual regulation. Learning settings are carried out by enriching and exploiting students' motivation to build self-confidence.

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