Cognitive ability improvement in learning resource development course through implementation of life-based learning models using LMS

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Abstract. The purpose of this study is to prove that the implementation of a life based learning model in the learning resource development course can improve students' cognitive abilities. The life based learning model was chosen because it was in accordance with the paradigm shift of the XXI century using the Learning Management System (LMS) as a learning medium. The selection of LMS as a medium also adapts the characteristics of students who are included in Z generation as objects of learning. The implementation of the LMS-based life based learning model was carried out in the learning resource development subject with 34 respondent of Informatics Engineering Education students in Universitas Negeri Malang. This research uses pre-experimental design research method with one-group pretest-posttest design model. The data obtained in this study comes from student learning outcomes. That data then analyzed using a different test (t-test). The results showed that with the implementation of a life based learning model using LMS, there was a significant increase in cognitive abilities as indicated by the results of different tests obtained between the pre-test and post-test.

1. Introduction
The learning process in university is usually done by face-to-face, as well as lecture activities conducted at the Universitas Negeri Malang. This learning is often referred as conventional learning models. Based on fact it can be seen that conventional learning has advantages, including by doing conventional learning (face-to-face), lecturers can directly monitor student development, interact directly with students, know the ability of each student and many others. However, conventional learning also have deficiency that are related to limited learning resources so that students' knowledge is only fixated on the learning resources set by the lecturer which results in limited student knowledge or insight. Moreover, the learning process will also take place in monotonous and less enjoyable as in the subject of the collection and processing tasks given by lecturers, students often lack the discipline and not on time.

Responding to this, the lecturer as a practitioner in the class must respond quickly by looking for a middle ground for the model of the implementation of learning in accordance with the times. This is where the role of technology as a learning medium is worthy of use. One of them is the use of LMS as a learning medium [1][2]. The use of LMS can be used as e-learning or blended learning media.
E-learning means that learning is done entirely online while blended learning is a learning that combines online and face-to-face activities in class.

In addition to the background on the importance of integrating ICT in lecture activities, the effort to approach learning in real life becomes a problem that is also resolved [3]. Learning activities in universities must be with real life in the community so that the material obtained by students can be easily understood and implemented in daily life. Therefore, researchers try to apply the Life Based Learning (LBL) model to improve students' understanding of lecture material.

Life Based Learning is a process of acquiring knowledge and skills to understand the nature of life, skilled in solving problems of life, living a balanced and harmonious life. Life Based Learning presents the concept that learning from life is real learning. The true school for humans is their life or life experience itself. Campus and school are part of the whole. True education is the overall process that a person undergoes in all of his life. Based on these principles, researchers develop or diversify the implementation of LMS-based LBL models to improve student cognitive learning outcomes and student learning independence.

Success in taking education to get a career provision is not only obtained in the school, especially when viewed from the results of cognitive learning (academic skills), but also outside of lectures or outside the classroom. Learning independence (self-regulated learning) is an effort towards success. Self-regulated learning encourages someone to study independently and professionally in training themselves to solve problems at work, either work to complete lecture assignments or work outside of lectures. The attitude of learning independence relates also to the achievement of learning outcomes which is a representation of the competence of students. There is a positive and significant relationship between learning independence and learning achievement.

Based on the description that has been stated, there is one learning model that suits the needs of life and integrates ICT is a model based on LMS-based life learning. The concept of life-based learning based on LMS can be interpreted as the implementation of various approaches to learning using LMS media with learning content that is appropriate to the needs of life. Life-Based Learning Based on LMS adopts a model Blended learning that integrates physical and virtual components is seen as an important strategy for learning [4]. In the implementation of LMS-based life-based learning a combination of face-to-face learning (conventional learning that brings lecturers and students directly in class), independent learning (learning using various media and independent learning resources) and learning that is carried out online [5]. By implementing LMS-based life-based learning models in learning resource development courses, it is expected that students can improve cognitive knowledge in making learning media well.

2. Research Methods

This study used a pre-experimental design research method with one-group pretest-posttest design model that is experimental design by comparing the conditions before and after treatment in an experimental class [6][7]. The effectiveness of the learning model is measured by comparing the competencies of students after treatment (O2) with the ability of participants before treatment (O1). The difference between O1 and O2 scores was analyzed using the t-test.

This pre-experimental study was conducted at the Universitas Negeri Malang (UM) in the odd semester of 2017/2018 school year. The study sample consisted of 34 students. The research instrument is divided into two: treatment instruments and measurement instruments. This treatment instrument is an instrument of learning tools that is integrated with the learning management system (LMS) in the learning resource development course.

The implementation of LMS-based life-based learning models is carried out by applying conventional learning models combined with online learning models with life-based learning content. At the time of conventional teaching, great students get the material in the classical style in the classroom by discussing the matter in accordance with the lesson plan, while currently online learning, learning is done through Edmodo (learning management system) that gives a chance by lecturers to provide additional material as well as feedback learning. Students collect assignments through
Edmodo which are then given notes by the lecturer to be better and when there are questions from students regarding the material or assignments given, the lecturer gives access to material, videos, animations, and quizzes as an answer as well as additional material outside school hours. This is so that students who do not understand the material when learning face to face can learn and explore the material online.

The research data was collected by using test and performance techniques to find out the improvement of students' cognitive abilities. Test instruments in the form of essay questions related to students' knowledge of ICT-assisted learning media which consists of 5 essay questions. The assessment instrument for the project (project) was developed based on lecture material consisting of the task of making power points, textbooks, videos, and moodle. The test instruments and assessment instruments are used in the experimental class. In this study, analysis was used using a different test (t-test) between students' initial abilities before getting the material and getting a lecture material.

3. Result and discussion

3.1. Result
This data is the initial ability of the participants before participating in learning activities in learning media development courses obtained from pre-test scores and learning outcomes data obtained from post-test scores after participating in learning activities using a learning management system. Pre-test data and the student post-test can be seen in Table 1.

| Score | Highest Score | Lowest Score | Average Score | Std deviasi | Asymp. Sig |
|-------|---------------|--------------|---------------|-------------|------------|
| Pretest | 970,00 | 61,00 | 65,35 | 2,52 | 0,200 |
| Postest | 86,00 | 73,00 | 80,32 | 3,63 | 0,200 |

In Table 1 it can be seen that in the course of developing learning resources LMS-based pre-test mean score of 65,35 and post-test of 80.03. The standard deviation is of 2.52 for pre-test and post-test scores can be seen in Table 1. In Table 2 it can be seen that the value of t is calculated from PTI 2013 student data is greater than t table (t count > t table), so it can be said that there is a significant difference between pre-test and post-test data.

Learning outcomes scores indicate differences in the level of learning outcomes before and after learning and teaching activities (t-count = -10.396, with p = 0.000 <0.05). That is, LMS is more interesting than the learning model that has been going on in the learning resource development course.

| PTI 2013 | N | x | Sig. | t tabel |
|----------|---|---|------|--------|
| Pretest  | 34 | 65,35 | 0,23 | 19,742 |
| Postest  | 34 | 80,32 |      |        |

Table 2 shows the results of different tests after treatment in the class. Through the table it can be seen that the k e complete body of the normal distribution of data, which is indicated by the value of normality> 0.05. Because it has fulfilled the analytical prerequisite test with normal data, parametric tests can be done using a t-test. The results of the t-test show that the overall significance value (Sig.) Is generated <0.05, so it can be concluded that there is a significant difference between the control class and the experimental class. When viewed from the mean score on the variable cognitive ability, the mean value of each class was higher than before the lecture. Based on these results, it can be
concluded that with the application of LMS-based life-based learning models, students' cognitive abilities are good.

3.2. Discussion
The results of the study stated that there was an effect of the application of LMS-based life-based learning models on learning that resulted in significant improvements in learning outcomes. This shows that the model applied is in accordance with the characteristics of the learning resource development course [8]. The material presented in the lecture is also adapted to the needs of students later in the field such as the development of textbooks that are in accordance with their competence.

Life Based Learning is the key to change and the development of new ecology learning in universities. Life Based Learning can be used as feedback for the implementation of learning in universities that are increasingly contextual-integrative-holistic. In the knowledge era, learning activities change from segmental activity to separate integrated and interconnected activities. Figure 1 shows an illustration of the ecological changes in learning from segmental separated into a new pattern of integrated learning activities.

![Illustration Figure 1 shows the change of new patterns of learning from segmental patterns to the ecological patterns of integrated learning - interconnection between personal, work, family, and the use of leisure. This new learning pattern is called Life Based Learning. Life Based Learning is not limited to learning to work, learning to get a job, let alone just learning in the workplace, learning to just get a GPA, diploma, certificate, free time at family, community. Staron (2011) stated "Life Based Learning proposes that learning for work is not restricted to learning at work" [9].

Life Based Learning is the process of acquiring knowledge and skills to understand the nature of life, skilled in solving problems of life, living a balanced and harmonious life. Life Based Learning presents the concept that learning from life is real learning. The existence of humans in the midst of society must exist. The true school for humans is their life or life experience itself. Campus and school are part of the whole. True education is the overall process that a person undergoes in all of his life.

The focus of Life Based Learning is the development of capabilities in the era of science to contribute to the welfare and happiness of society. Learning capability is measured by the usefulness of knowledge developed in building prosperity and happiness in living together. Science facilitates life while the art of caring for life and religion directs life. All three must develop side by side to be used well in building achievements with harmony.

In technical improvement activities, students are helped by LMS-based life-based learning models. Through lecturer and student learning management systems (LMS), it has a convenient place to communicate, collaborate, share learning content, discuss in virtual classes, and apply online learning evaluations. The types of material uploaded are various types such as text, images, videos and animation, making students motivated to learn [10]. In essence, LMS provides everything that can be done in the classroom in learning activities, including the creation and implementation of learning evaluations and management of student learning outcomes. Learning using sites LMS, like Edmodo, offers a unique opportunity to connect teachers with students in creating a new learning atmosphere. To complete the final project in the form of learning media, students can actively consult with
lecturers and discuss with group members intensely by uploading the progress of their tasks. This is a very good solution because during normal learning hours, ordinary lecturers are preoccupied with other tasks so that the right time for consulting progress is outside the lecture hours.

The implementation of LMS-based life-based learning accommodates the learning styles of students who are currently in the Z generation or "digital native", namely the generation that is familiar with digital devices and easy to accept learning models integrated with ICT [11]. Generation Z students are equipped with multitasking skills that are better and more productive than previous generations [12]. This is because, at present ICT facilities, including the internet are very easily accessible to students, so generation Z has a good ability to process a lot of the information they collect [13]. Therefore, the implementation of blended learning models by utilizing learning management systems can help students to develop their cognitive abilities and technical skills.

4. Conclusion

Based on the results of data analysis and discussion it can be concluded that the implementation of life-based learning models can improve students' cognitive abilities. Students who are very familiar with the digital world makes life lecturers implement the model-based LMS-based learning is done by combining conventional learning models (face to face) with online learning. In the conventional learning is most students have direct knowledge of lecturers through a series of interactions in class, while the deepening of the material is done online via the learning management system. Increased cognitive abilities acquired by habituation collegian for independent study and explore the material that has been given in the classroom. Lecturers give triggers to students through a series of discussions about material through LMS so that students naturally search, analyze, and interpret information available online.

Success in the implementation of the learning and learning model is supported by facilities and infrastructure that meet the LMS media access. Additionally significant improvement learning outcomes is also supported by the characteristics of the collegian in Z generation era that has multitasking capabilities, innovative, creative, and familiar with the digital world, so that when the implementation of online learning, collegian easy to use the media very well. With the improvement of cognitive abilities and technical skills of students in making learning media, students are expected to have a critical-creative, innovative, and updated mindset and outlook, so that education can be done better. Students are expected to increasingly understand the importance of methods and media in learning activities, with the hope that when they become teachers or lecturers, they can implement knowledge, especially the science of developing learning media can be applied properly.

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