

# DEVELOPMENT OF LEARNING MODELS FOR COMPUTER MATHEMATICS COURSES IN VIRTUAL-BASED LEARNING CENTER AREAS

<sup>1</sup>A.Muhammad Syafar\*, <sup>2</sup>Andi Syarifuddin, <sup>3</sup>Abdullah Basalamah, <sup>4</sup>Nurul Fuadi,  
<sup>5</sup>Widya Wisanty, <sup>6</sup>Haswah

<sup>1</sup>*Informatic Engineering, Alauddin State Islamic University of Makassar, Indonesia*

<sup>2,3</sup>*Electrical Engineering, Indonesian Muslim of University*

<sup>4</sup>*Fisika, Alauddin State Islamic University of Makassar, Indonesia*

<sup>5</sup>*Electrical Engineering, Sawerigading University of Makassar, Indonesia*

<sup>6</sup>*SMK Negeri 1 Bone, Indonesia*

Email : <sup>1</sup>*andi.syafar@uin-alauddin.ac.id,*

<sup>2</sup>*asyarif@umi.ac.id,*

<sup>3</sup>*abdullah.basalamah@umi.ac.id,*

<sup>4</sup>*nurul.fuadi@uin-alauddin.ac.id,*

<sup>5</sup>*wwisanty@yahoo.co.id,*

<sup>6</sup>*haswahm.pd@gmail.com*

\*Corresponding author. Email: *andi.syafar@uin-alauddin.ac.id*

**Abstract.** This study aims to determine the characteristics of the *Virtual Class* learning model developed and produce a learning model for the Computer Mathematics Course in the *Learning Center Area* that is valid, practical and effective. This research is a research and development that refers to the ADDIE development model which consists of 4 phases, namely the Analysis phase, design phase, realization phase, and test phase. The trial activities in this study were carried out twice, namely trial I was carried out in class A and trial II was carried out in class B students majoring in informatics engineering, Alauddin State Islamic University Makassar class of 2020. The results showed that the virtual class model is valid, practical and effective and has 6 characteristics or characteristics, namely: (1) the model was developed to improve the parts that have been obstacles to the use of the *virtual class* model so far, (2) the model is designed to be *full online*, (3) the model is designed for the development of student learning through several activities that support.

**Keywords:** Model, Development, *Virtual Class*, Computer Mathematics

## 1. INTRODUCTION

Nowadays the development of technology is very dynamic form of improvement. Where it can be seen that starting in 2020 until now the use of online learning has begun to be introduced as a form of implementation of distance learning due to restrictions on the face-to-face learning process. The conditions experienced by students, especially students majoring in Informatics Engineering

UIN Alauddin Makassar due to the pandemic, were really helped by online learning.

The positive impact that can be felt in real terms from advances in the field of technology that have been applied in the world of education is the implementation of distance learning using E-Learning. E-Learning is a medium used to channel information from educators to students through computer media and the internet. E-learning allows educators and learners to conduct learning without having to meet physically and is not limited in time to do learning. E-Learning is also often understood as a form of web-based learning that can be accessed on computer networks, both in the form of intranets and the internet. Currently, e-learning has been utilized in various learning models based on Information and Communication Technology, one example is the E-learning virtual class model. In the process of adapting to rapidly developing information technology, supported by the current covid-19 conditions, it directly stimulates a shift in the learning paradigm that must change, from a *teaching community* to a *learning community*.

In the framework of responding to the Covid-19 pandemic, the government has set a policy breakthrough that entrusts all citizens to carry out the adaptation process. All affirmative actions are oriented towards avoiding and saving all citizens from the potential to be exposed to the Covid-19 outbreak. The outbreak knows no boundaries of time and space, including the world of education which is very prone to exposure to this outbreak. The Covid-19 pandemic has had a major impact on various sectors, one of which is the education sector, which entrusts education stakeholders to respond quickly and appropriately.

The educational ecosystem is required to be built to adapt to virtual learning technology as a new habitus. It seems as if all educational units at all levels are 'forced' to transform to adapt quickly and measurably, one of which is by conducting distance learning by utilizing online media. Educators (lecturers), again, are encouraged to continue to ensure that learning activities continue, even though students are in their respective homes. The solution is that lecturers are required to design learning media as innovation and creativity, one of which is by utilizing online media.

To be precise, the progressive policy implemented by the government is an instruction to migrate learning which has been conventionally carried out by campus to be diverted to homes in order to comply with the rules in the Covid-19 handling protocol, one of which is the ban on gatherings, so that the constructive solution is physical *distancing*. . Thus, during the pandemic, lecturers/educators, students, are required to adapt to Distance Learning (PJJ) or commonly known as distance learning.

Distance Learning (PJJ) is implemented like an online learning model which in the context of UIN Alauddin provider since awal has been built through

the *Learning Management System* (LMS), moving learning activities to the home. As much as possible, schools should anticipate that corona does not spread in their neighborhoods.

LENTERA (Learning Center Area) is a space or place for online student learning or commonly called e-learning. LENTERA was developed with a *virtual class* model that aims to assist lecturers in teaching and facilitate students in the lecture process.

Virtual Class in E-learning is an online learning environment, in this case the environment in question can be web-based, portal or software-based. According to Hartley (2001) virtual classes in E-Learning are a type of teaching and learning that allows the delivery of teaching materials to students using the Internet, Intranet or other computer network media". The activities carried out by lecturers are learning through virtual classes, namely: 1) Opening classes, here lecturers give instructions to students to do absenteeism; 2) Class closure; 3) Presentation with streaming video; 4) Upload and download lecture materials to be given;

5) Making exam questions, the question model is completely handed over to the teaching lecturer; 6) Check the number of students who attend or take part in this virtual class; 7) Provide answers to questions asked by students using a microphone or through chatting; 8) Provide tasks that support the material presented; 9) Discussion through forums (optional).

While the activities carried out by students are: 1) Online Absence using the web provided; 2) Evaluation in Online form; 3) Interact with lecturers audio-visually and or use chat facilities; 4) Discussion through forums (optional).

The current condition is undeniable that in recent years technology-based learning (E-learning) has begun to receive special attention from various educational institutions and education actors in Indonesia. (Zhou et al., 2020) e-learning or online-based learning is a learning model that encourages users (students/teachers/instructors) to utilize information and communication technology platforms in the teaching and learning process. In line with what was stated by Arif & Wahyu (2014) that E-learning is a teaching and learning method using a system as a teaching and learning medium connected to the network. Talebian et al., (2014) emphasize that to encourage online-based learning, teachers and students must take advantage of a learning platform that suits the needs and conditions of these users. Even Sulisworo et al., (2016) and Zhou et al., (2020) agree that technology-based learning brings many benefits and is in accordance with the current era, namely the era of technology 4.0.

Syafar (2022) Positive effects felt due to rapid technological developments that can be felt by the effects. The use of E-learning is a real solution in overcoming

learning problems. E-learning, especially in virtual classroom media, is understood as a distance learning solution so that learning is still carried out. E-learning makes it easy as a web-based learning medium.

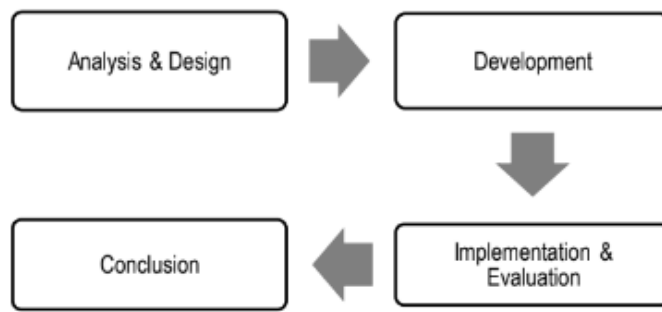
Yudha & Herzamzam, 2020) stated that online learning or online (online) is a learning that is able to facilitate learners to learn more widely, more and varied. Through the facilities provided by the system, learners can learn anytime and anywhere without being limited by distance, space and time. Santoso (2020) continued this resulting in the teaching and learning process or learning that is usually carried out in the classroom, must be carried out at home through the virtual world. Thus, making it more challenging for educators and learners to obtain the learning objectives themselves, especially in mathematics learning in general, students find it difficult to accept the material and find solutions to the given problems. Current conditions urge educators to innovate and adapt related to the use of available technology to support the learning process (Ahmed, shehata & hassanien, 2020). Which consists of various components that are interconnected with each other. Such components include: objectives, materials, methods, and evaluations. The four components of learning must be considered by lecturers in choosing and determining the learning models that will be used in learning activities.

## **2. METHODS**

This type of research is research and development (R&D). The research was conducted by creating and developing a learning model for Computer Mathematics Courses in a Virtual-based Learning Center Area in the Department of Informatics Engineering, Faculty of Science and Technology UIN Alauddin.

This research will be conducted at the Department of Informatics Engineering, Faculty of Science and Technology, UIN Alauddin Makassar. In the Computer Mathematics course. The implementation of this research starts from surveying research problems to collecting data on research results from implementation.

The learning model development procedure is divided into 3 groups of activities, namely pre-development (analysis & Design), development (Development) and application of the model (Implementation & Evaluation)



**Figure 1.** Data analysis process

Learning activities, in their implementation, know many terms to describe the way of teaching that will be carried out by lecturers. Currently, there are so many kinds of learning strategies or methods that aim to improve the quality of learning for the better. Learning is a system,

The research was carried out in several stages, starting with checking all research documentation, then making observations during the learning process, followed by interviews. Observations are made to find out the creativity of students during the learning process. Documentation is used to measure a student's ability. Interview techniques are carried out to reinforce the results obtained from the observations of the students.

### **3. RESULTS AND DISCUSSION**

LENTERA (Learning Center Area) is a space or place for online student learning or commonly called e-learning. LENTERA was developed with a *virtual class* model that aims to assist lecturers in teaching and facilitate students in the lecture process



**Fig 2.** LENTERA Home Page

The application of virtual classroom media in this implementation uses virtual media in the E- Learning Computer Mathematics Course. Features such as:



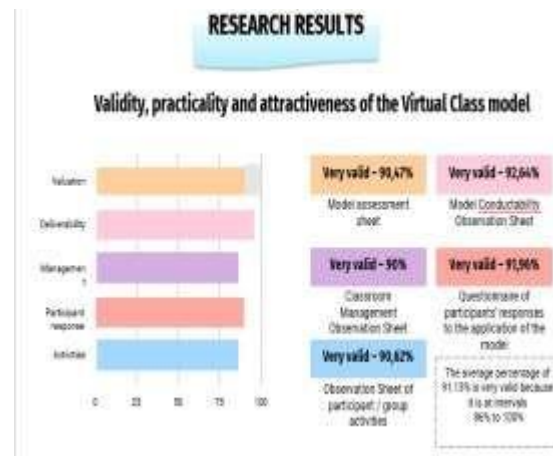
**Fig 3.** Virtual Class Implementation



**Fig 4.** Computer Mathematics Courses



**Fig 5** The meet process takes place



**Fig 6.** Research results

#### 4. CONCLUSION

In the learning model developed in the scope of higher education, one of the learning models is virtual classes. Where virtual classes are one of the interactive models between lecturers and students. In online learning, the existence of classes where learning is held is replaced by virtual classes called *Learning Management System (LMS)*.

*Virtual Class* is able to facilitate learning media, it is hoped that students and lecturers will be helped by the media. Virtual Class can run well if the interaction and collaboration between the parties involved (i.e. teachers and learners) runs in a controlled and dynamic manner

Virtual Class media can be used as a medium in the teaching and learning process which has a function as interactive tutorial media, teaching aids and test equipment so that it will be very helpful in the process of delivering and understanding the material to students anywhere and anytime.

#### References

1. Handarini, O. I., & Wulandari, S. S. (2020). Pembelajaran Daring Sebagai Upaya Study From Home ( SFH ) Selama Pandemi Covid 19 Pembelajaran Daring Sebagai Upaya Study From Home ( SFH ) ... .. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, 8(1), 496–503.
2. Oktavian, R., Aldya, R. F., Indonesia, U. K., & Tunggadewi, U. T. (2020).
3. EFEKTIVITAS PEMBELAJARAN DARING TERINTEGRASI DI ERA.
4. *Didaktis: Jurnal Pendidikan Dan Ilmu Pengetahuan*, 20(2), 129–135.
5. Pustipad. (2020). *Petunjuk Penggunaan Lentera*. <http://sin.fst.uin-alauddin.ac.id/wp-content/uploads/2020/06/panduan-elearning-lentera-v1-UIN-Alauddin-Makassar-Sistem-Informasi.pdf>
6. Riyana, C. (2015). Produksi Bahan Pembelajaran Berbasis Online. *Modul Pembelajaran Universitas Terbuka Tangerang Selatan*, 1–43.
7. Sadikin, A., Hamidah, A., Pinang, K., Jl, M.,
8. Ma, J., Km, B., Indah, M., Jaluko, K., Kode, K. M., & Indonesia, P. (2020). Pembelajaran Daring di Tengah Wabah Covid-19 ( Online Learning in the Middle of the Covid-19 Pandemic ).
9. *BIODIK: Jurnal Ilmiah Pendidikan Biologi*, 6(1), 214–224.
10. Syafar, Muhammad A. (2021). *Filsafat Ilmu dan Rekonstruksi Teori Mata Kuliah Matematika Komputer Pada Lentera (Learning Center Area) Virtual Class*. ISBN: 978-623-98745-1-3, Penerbit Grafika