



## Evaluation of learning with technology 4.0 approach in the implementation of higher education

Mesterjon <sup>1</sup>, Dwi Rulismi <sup>2</sup>, Johannes Sapri <sup>3</sup>

<sup>1</sup> Dehasen University, Indonesia

<sup>2</sup> Professor, Faculty of Teacher Training and Education, Dehasen University, Indonesia

<sup>3</sup> Bengkulu University, Indonesia

### Abstract

This study aims to obtain an overview of the implementation of learning management with the information and communication technology approach (technology 4.0) to improve the learning management system in tertiary institutions, especially Bengkulu province during the covid 19 pandemic. Leadership policies regarding management standards in order to improve the quality of tertiary management which in turn ultimately aims to strengthen the competitiveness of tertiary institutions. In this research, it will be examined further and more carefully on the factors of Higher Education learning management through ICT information systems in order to improve the quality of Higher Education competitiveness. Although there are many other factors, this research focuses on: Discovering ICT tools, Learning how to use ICT tools, Understanding how and when to use ICT tools to achieve particular purposes (understanding how and when to use ICT tools to achieve certain goals) and Specializing in the use of ICT tools (specializing in the use of ICT tools). The results showed that: Availability of ICT network infrastructure services 98.066% available, Availability of SIAKAD software services 89.972%, Availability of E library software services 98.523%, Availability of E learning software services 89.056%, Availability of e journal software services 78.067% and Availability of tracer study software services 76.087%. It can be concluded that the 4.0 era of technology for universities is also a force that can transform universities from a monopoly science institution into an institution of many types of organizations that provide information and from one institution that is always limited by time and geography has transformed into an institution without limits and can be accessed easily and quickly. In this dynamic environmental situation, learning management based on the universal system in the era of Covid-19 is an option to be able to increase the effectiveness and productivity of learning management management in order to create an organization that can provide services that satisfy students and society in general as well as educational objects. (parents and students) in particular. At the same time, they can also compete effectively in local, national and even global contexts. In other words, universities in the era of Covid-19 are now required to develop management learning systems in order to increase the effectiveness and productivity of higher education management which can be accessed by all students, lecturers and stakeholders. This is a strategy and as an anticipatory step towards new trends.

**Keywords:** learning management, technology 4.0

### Introduction

Management is the key to an educational institution, especially tertiary institutions, because with management it can help process activities that will be carried out by all parties involved directly or indirectly from these activities, such is the importance of management. as expected, this is in line with the opinion of U. Saefullah 2012 <sup>[43]</sup>, "that management comes from the word to manage which means to organize, manage, and manage, it is also the same as according to Hikmat 2015 that, "management in English means to manage, namely to organize and manage. Therefore this research needs to know about learning management which can be used as a reference for educational institutions.

Higher education learning management in the perspective of higher education is a form of activity that starts from regulation, teaching and learning process, until the achievement of an effective and efficient teaching and learning process. Basically, learning management is the regulation of all aspects of learning activities in tertiary institutions, both learning activities that are categorized in the core and supporting curriculum, based on the curriculum previously determined by the Ministry of National

Education or the Ministry of Religion. According to Ibrahim Bafadal 2013 <sup>[9]</sup>, learning management is all efforts to regulate the teaching and learning process in order to achieve an effective and efficient teaching and learning process. Learning program management is often referred to as curriculum and learning management. From this explanation, it can be explained that higher education learning management is a learning management strategy that has an impact on effective and efficient services. Learning management is a leadership effort in planning, implementing, and evaluating learning with various existing components to support the learning process as a whole. effective.

Technology 4.0 is a phenomenon that collaborates cyber technology and automation technology. The concept of its application is centered on the concept of automation carried out by technology without the need for human labor in the application process. The current era demands various changes in all aspects so that it is called the era of the industrial revolution 4.0, where universities must maximize lecture methods so that students can prepare themselves optimally and highlight uniqueness and added value. Reflecting on the stages of how individuals master ICT, the

stages grouped by UNESCO (2017: 16)<sup>[42]</sup> are divided into a). Discovering ICT tools, b). Learning how to use ICT tools (learn how to use ICT tools), c). Understanding how and when to use ICT tools to achieve particular purposes (understanding how and when to use ICT tools to achieve certain goals) and d). Specializing in the use of ICT tools (specializing in the use of ICT tools).

Based on the system theory put forward by Shuterland (2016), a system can be seen as a series of sequential causes and effects, where inputs that flow are captured and entered into the system, then processed and converted into outputs that flow out through a number of processes. He stated that "a system is seen as a causal sequence which finds a stream of inputs being transformed into a stream of outputs by some processes". He named this kind of model as the "black box" model. Output will affect the environment, resulting in changes in the environment. Information about environmental changes will be feedback, which is then captured again by the system as new input. And so on.

Bonita J. Campbel (1979) in the book *Understanding Information Systems: Foundations for Control* emphasizes that a system is "any group of interrelated components or parts which function together to achieve a goal" (a set of parts or components that are interrelated and together to function or move to achieve a goal). Theo Lippeveld, Rainer Saurbom, and Claude Bodart (2000) in the book *Design and Implementation of Health Information System* defines the system as "any collection of components that work together to achieve a common objective" (a set of components that work together to achieve a common goals).

In this dynamic environment, learning management based on technology 4.0 is an option to be able to increase the effectiveness and productivity of Higher Education management in order to create an organization that can provide services that satisfy students and society in general as well as educational objects (parents and students). in particular. At the same time, they can also compete effectively in local, national and even global contexts.

In other words, universities are now required to develop ICT-based learning management in order to increase the effectiveness and productivity of PTS management which can be accessed by all students, lecturers and stakeholders. This is a strategy and operation that is basically widely applied in the business world, as an anticipatory measure against new trends in order to achieve and maintain its competitive position, so that later it can produce human beings who have quality human resources according to the needs of the times.

The social distancing policy set by the government has an impact on the wheels of human life, including the higher education sector which has also been affected by this policy. The government's sudden decision to close or move the learning process from campus to home created confusion for many parties, due to the unpreparedness of schools to carry out online learning. management of learning and how to overcome the difficulties of the learning system in tertiary institutions by utilizing ICT technology.

Based on the results of observations, the universities in Bengkulu Province spread over these four stages, but in several higher education institutions the academic community (lecturers, management, and students) have reached the stages of mastery C and D, namely understanding how and when to use ICT devices to perform a certain task (skill C), and have mastered specifically the use of ICT devices (skill D).

Meanwhile, when viewed from the data released by BAN PT from 2018 to 2020, it is found that: 1). Muhammadiyah University of Bengkulu, which has 9,000 students spread across 9 faculties, 22 study programs, obtained study program accreditation with A = 2 value, B = 17 study programs and C = 3 study programs. 2). Hazairin University Bengkulu has 4000 students spread across 6 faculties, 11 study programs, so study program accreditation is obtained with A = 1 study program, B = 7 study programs and C = 3 study programs. 3). Dehasen Bengkulu University has 7000 students spread across 8 faculties, 18 study programs, has an accreditation score of A = 0 (none), has a value of B = 15 study programs and has a value of C = 3 study programs.

As well as the social distancing policy set by the government has an impact on the wheels of human life, including the higher education sector which is also affected by this policy. The government's sudden decision to close or move the learning process from campus to home made many parties confused, due to the unpreparedness of universities to implement online learning.

Therefore, researchers conducted research with the title *Analysis of learning management in tertiary institutions through 4.O technology*. The aim of this study was to obtain an overview of the implementation of information communication technology (ICT)-based learning management to improve the quality of tertiary institutions in Bengkulu Province. Leadership policies regarding management standards in order to improve the quality of higher education management, which ultimately aims to strengthen the competitiveness of tertiary institutions. This research will examine further and more carefully the Management factors for improving the quality of Higher Education through an information communication technology (ICT) based information system in order to improve the quality of the competitiveness of Higher Education.

### Methods / methods

Contains The method used in this research is a descriptive method with a qualitative approach, the author intends to look at the realities in the field by using interview and documentation techniques. explore and explore data, information that correlates with the implementation of information communication technology (ICT)-based management systems to increase the effectiveness and productivity of learning management in tertiary institutions with the aim of generating hypotheses from field research. The findings of the research results only apply to the units studied.

Data collection is the first step in this research because the main objective of this research is to obtain as much data and information, to obtain and find data that meets the standards, this research must use appropriate data collection techniques.

Data and information that researchers want to collect in this study include; academic policies, organizational behavior, student intelligence, higher education ICT culture, length of study completion, quality documents and data or certain phenomena. So based on the categories of data and information, the data collection techniques that researchers use are: 1). Observation; 2). Interview; and 3). Documentation study.

As for the resources in this study are informants, as initial informants selected purposively, research objects that master the problem under study (key informants). Further information was asked to the initial informant to propose

other people who could provide information, and then this information was also asked to show other informants, and so on.

The researcher as an instrument plays a direct role in interacting with information sources, namely leaders and lecturers in a free interview and also observes social situations, after which the data that has been disclosed is checked whether there is a correlation or not. The stages in this study can be distinguished into two stages, namely: the exploration stage and the member check stage (Lincoln and Guba, 1985-236)

The stages in this study are: 1) Preparatory stages, according to Moleong, lexy J. (2017: 127-136) the activities and considerations are described as follows: a) preparing a research design, b) choosing a field, c) arranging permits, d) assessing the field, e) selecting and utilizing informants, f) preparing research equipment, g) research ethics issues. 2) The stages of work at school, according to Moleong, Lexy J. (2017:137-147) description of the stages of field work or in this case at school are divided into three stages, namely: a) understanding the research background and self preparation, b) entering the field, c) participate in collecting data. 3) The stages of data analysis, according to Moleong, Lexy J. (2017:148-152) description of the stages of data analysis include: a) Data processing, b) categorization, c) data interpretation.

**Results and discussion**

Results Based on research that has been conducted on three coded subjects, namely PT XYZ\_1, PT XYZ\_2 and PT XYZ\_3, then the results of the analysis from the research on Learning Management in Higher Education through the 4.O Technology Approach and the findings obtained will be presented, while the research results are as follows:

1. Observation Results and Learning System Tests (LS) on Individual Stages of Mastering ICT (ISM) at PT Xyz\_1

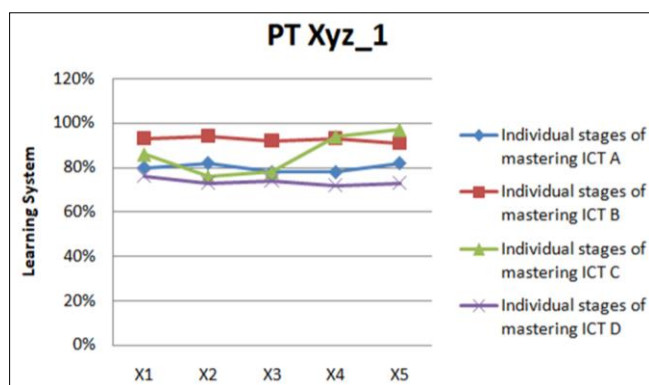


Fig 1: Results of interviews and tests (LS) at (ISM) PT Xyz\_1

Obtained on campus Xyz\_1 that LS (x1..x5), where x1 is really needed by students because at ISM (A) students get good access to ICT network availability with INCREASING Trends, while at LS (x2) students need admin applications that can be accessed via the Web, because at ISM (B) students learn how to find ICT tools with a DECREASING Trend; in LS (x3) students have utilized the available eleraning learning applications, because in ISM (C) students have understood how and when to use ICT tools to achieve learning goals with INCREASING Trends, while in LS (x4) students have used the e library because in ISM (D) students are used to specializing in ICT-based learning with CONSTANT Trends.

2. Results of Observations, Tests and Learning System Interviews (SP) on Individual Stages of Mastering ICT (PI) at PT XYZ\_2.

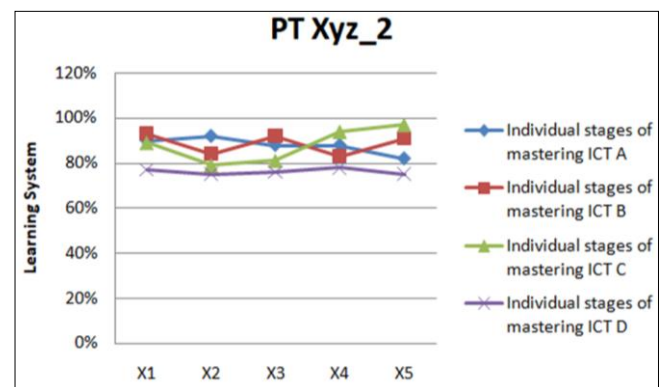


Fig 2: Results of interviews and tests (LS) at (ISM) PT Xyz\_2

Obtained on campus Xyz\_2 that LS (x1..x5), where x1 is really needed by students because at ISM (A) students get good access to ICT network availability with a DECREASING trend, while at LS (x2) students need admin applications that can be accessed via the Web, because at ISM (B) students learn how to find ICT tools with CONSTANT Trends; in LS (x3) students have utilized the available eleraning learning applications, because in ISM (C) students have understood how and when to use ICT tools to achieve learning goals with INCREASING Trends, while in LS (x4) students have used the e library because in ISM (D) students have used to specialize in ICT-based learning with a DECREASING trend.

3. Observation Results and Learning System Tests (LS) on Individual Stages of Mastering ICT (ISM) at PT XYZ\_3

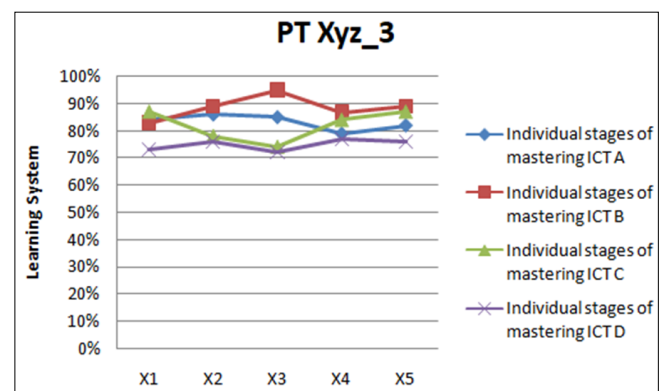


Fig 3: Interview and Test Results (LS) at (ISM) PT Xyz\_3

Obtained on campus Xyz\_2 that LS (x1..x5), where x1 is really needed by students because at ISM (A) students get good access to ICT network availability with a DECREASING trend, while at LS (x2) students need admin applications that can be accessed via the Web, because at ISM (B) students learn how to find ICT tools with a DECREASING Trend; in LS (x3) students have utilized the available eleraning learning applications, because in ISM (C) students have understood how and when to use ICT tools to achieve learning goals with INCREASING Trends, while in LS (x4) students have used the e library because in ISM (D) students are used to specializing in ICT-based learning with CONSTANT Trends.

#### 4. Suggestion conclusion

It is known that x1 (Availability of ICT network infrastructure) on campus Xyz\_1,2,3 obtained 84% of students and academics can easily find ICT tools for learning, 83% of students can easily learn how to use ICT tools for learning on campus, 87% students can understand how and when to use ICT tools to achieve certain goals in learning and 73% of students have specialized in learning and learning using ICT tools.

on x2 (Availability of student Academic Information Systems) on campus Xyz\_1,2,3 obtained interview results 86% of students and academics can easily find the SIAKAD system for ADM and learning, 89% of students can easily learn how to use the SIAKAD system for ADM and campus learning, 78% of students can understand how and when to use SIAKAD for ADM to achieve certain goals in learning and 76% of students have specialized in learning and learning using SIAKAD and campus ADM equipment.

on x3 (Availability of e learning applications) on campus Xyz\_1,2,3 obtained interview results 85% of students and academics can easily find e learning applications for learning, 95% of students can easily learn how to use e learning applications for learning on campus, 74% of students can understand how and when to use e learning applications to achieve certain goals in learning and 72% of students have specialized in learning and learning using e learning applications on campus.

on x4 (Availability of the e-Library application) on campus Xyz\_1,2,3 obtained the results of interviews 79% of students and academics can easily find the e-Library application for reference and learning, 87% of students can easily learn how to use the e-Library application for campus learning, 84% of students can understand how and when to use the e Library application to achieve certain goals in learning and 77% of students have specialized in learning and learning using the e Library application on campus.

at x5 (Availability of e-Journal applications) on campus Xyz\_1,2,3 obtained interview results 82% of students and academics can easily find e-Journal applications for reference and learning, 89% of students can easily learn how to use e-Journal applications for campus learning, 87% of students can understand how and when to use the eJournal application to achieve certain goals in learning and 75% of students have specialized in learning and learning using the eJournal application on campus.

#### Information

1. Xyz\_1 is Dehasen Bengkulu University,
2. Xyz\_2 is Muhammadiyah University of Bengkulu,
3. Xyz\_3 is Hazairin Bengkulu University

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