P-ISSN: 2776-7329, E-ISSN: 2776-7310
Proceedings
5th Vocational Education International Conference
Semarang, 13 July 2023

Digital Module Innovation in Artificial Intelligence Courses

Sri Ayu Ashari*, Esta Larosa, Ihsanulfu`ad Suwandi, Wahyu Saputra, Sugeng Pramudibyo

Gorontalo State University
**Email: sriayu@ung.ac.id*

ABSTRACT
The purpose of this research is to describe the utilization of Digital Module Innovation. This paper is descriptive with the research design used is literature review. Based on the presentation of Digital Module Innovation, it provides benefits that can provide convenience for educators and students in carrying out the learning process. The benefits of implementing IMD include: (1) Presentation of learning material information about artificial intelligence is easier to understand, can be accessed anywhere, anytime, and provides an attractive appearance and is complemented by interactive learning materials, infographics and videos. (2) Utilizing technology in the Society 5.0 era with digital learning modules making it easy to access learning, facilitating communication and collaboration to interact to share ideas on available platform facilities, there are activity icons in the form of case method discussion forums, quiz work, google meet for moodle, H5P interactive content.

Keywords: *Artificial intelligence, Digital module, Innovation.*

I. INTRODUCTION

Technological developments bring benefits that play an important role in the world of education. Digital Module Innovation is the development of electronic-based learning (E-Learning) resulting from the 3rd educational revolution. The mid-1990s was an era when E-learning made learning media in the form of electronic and digital media increase with the development of the internet in the form of web-based training (Web-Based Trainings[1]. At the beginning of the 21st century, then, the development of technological processes and resources forced the younger generation to be prepared to become self-centered learners (students), namely education 4.0 (education 4.0) which would then be integrated with industry 4.0 (industrial digitalization) where the use of information technology and communication is very important among them is AI artificial intelligence [2][3]. Education 4.0 allows students to adapt and have a dynamic mindset, not just in the form of repetitive activities [4]. Educational level Learning is inseparable from creative and innovative learning media. Based on research conducted [5] said that the use of interesting learning media can increase student learning interest. One of the learning media, namely modules, learning modules are independent teaching materials that are designed in a structured and systematic manner, and are equipped with material that facilitates the teaching and learning process. The problems found, there are still teachers who use conventional modules in teaching, conventional modules still have deficiencies, limited by space and time, learning must be carried out face-to-face, and cannot be accessed anywhere and anytime.

There is an increase in the creation of technology at this time, all parties in the world of education must be able to balance and keep abreast of existing technological advances [6]. Through the use of technology in the era of society 5.0 in education, it is hoped that it can add information for educators and students, improve learning abilities for students, facilitate access to learning, study material is more interesting, and is expected to increase interest in learning. The need for the use of technology in learning is not only at the formal school level but also important at the higher education level.

Technology education in Indonesia tends to be open to the application of distance learning learning models. The distance learning learning model requires interactive technology, multimedia and the internet. To support this

learning model, one of them is a digital-based learning module.

Digital-based modules are tools or can be in the form of learning tools, containing material, methods, as well as various limitations and ways of evaluating that can be designed in a systematic and attractive way to achieve the required competency based on the level of complexity electronically as explained [7] E-Module is a development of conventional module models by utilizing information technology.

Teaching innovation needs to be continuously improved to achieve higher quality learning outcomes [8] utilizing technology that continues to develop, human intelligence also develops which results in the emergence of the latest technology to solve the problems faced. The more information technology develops, the more various innovations are produced [13] [14] [15] [9], One of them is digital module innovation.

The development of digital module innovations is a must for educators, in this case the Information Technology Education lecturer at the Faculty of Engineering, Gorontalo State University as an implementation of learning program policies both online and offline by designing interesting learning and providing learning aids that support the learning process. One of the study program courses is artificial intelligence. Artificial intelligence is one of the vocational courses in the information technology education study program which provides knowledge about basic application development techniques that apply artificial intelligence [10] [11] [12]. Introducing students to the basic concepts of artificial intelligence starting from the basic techniques of searching, reasoning, planning, learning, etc. In addition, they are given simple computational problems that must be solved using the concepts that have been introduced and implemented using machine learning algorithms.

2. METHOD

This paper is descriptive with the research design used is literature review. Researchers collected data from various journals and retrieved data from the Spada page regarding Digital Module Innovation (IMD) in Artificial Intelligence courses.

3. RESULTS AND DISCUSSION

Lecture activities, both theory and practicum, are an integral part of the implementation of lectures that must be followed by every student and are adjusted to the competence of the study program. For the implementation of lectures, it combines offline and online lectures.

Offline lectures certainly make it possible for students to be directed directly by the lecturer who is teaching the subject, especially when doing practicums. However, online lectures, this is where the digital learning module plays a role in helping students carry out independent learning, both theory and practice. So that the developed module is expected to be able to direct students in independent learning.

The innovation of this artificial intelligence digital module learns about the basic concepts of artificial intelligence and its development, the basic concepts of knowledge along with knowledge representation methods, problem solving techniques using the search method, and the application of intelligent systems in the field of artificial intelligence. The implementation of this digital module innovation can be used by students in learning management systems (LMS) SPADA, State University of Gorontalo.

The start page of the artificial intelligence digital module innovation is as follows:

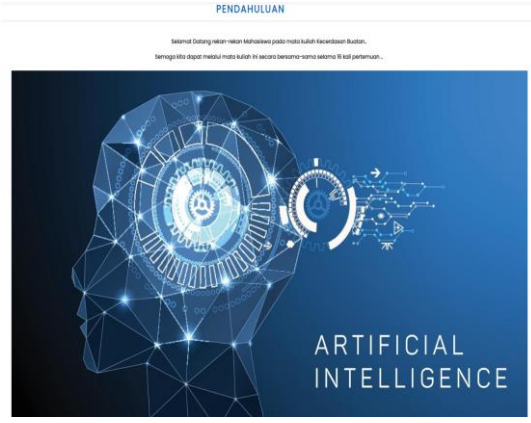

Figure 1. Start Page.

The introductory display provides information about course identity, lecturer identity, course descriptions, learning outcomes, learning materials, learning methods and lecture contracts and there is an introductory video by the supporting lecturer regarding the artificial intelligence course. This introduction also contains the Semester Learning Plan that will be used.

Innovations in the development of teaching materials at each meeting are presented with interactive learning videos relating to each material supported by modules so as to provide information and clarify and make it easier for the presentation of the material and make it easier for students to understand learning material without being explained verbally as shown below.

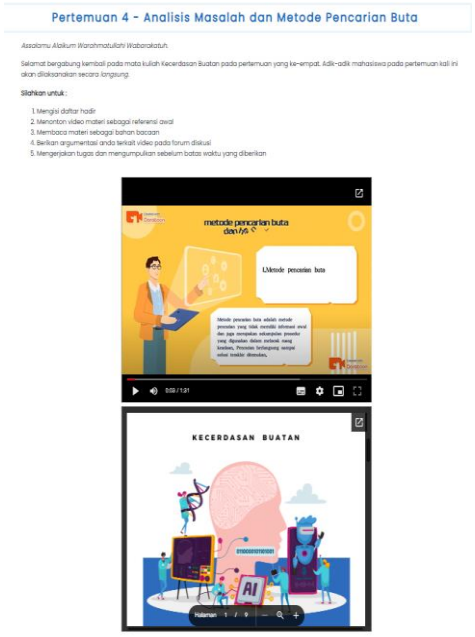

Figure 2. Problem Analysis and Search Method

The assignments at each meeting vary based on the suitability of the material, such as students are faced with a case method where students are directed and to analyze these problems by utilizing the interactive context h5p icon and blackboard so that feedback from learning activities occurs. This is called a virtual mentor in the application of artificial intelligence in the education sector.

Assessment mechanisms and evaluation of learning outcomes are available in this digital module so that it makes it easier for educators to carry out assessments. This is in line with the use of technology in the era of society 5.0.

4. RESULT

Based on the presentation of Digital Module Innovation, it provides benefits that can provide convenience for educators and students in carrying out the learning process. The benefits of implementing IMD include:

(1) Presentation of learning material information about artificial intelligence is easier to understand, can be accessed anywhere, anytime, and provides an attractive appearance and is complemented by interactive learning materials, infographics and videos.

(2) Utilizing technology in the Society 5.0 era with digital learning modules making it easy to access learning, facilitating communication and collaboration to interact to share ideas on available platform facilities, there are activity icons in the form of case method discussion forums, quiz work, google meet for moodle, H5P interactive content.

AUTHORS' CONTRIBUTIONS

The author's contributions to this paper include:

1. Sri Ayu Ashari, as the main author who compiled this paper.
2. Esta Larosa, Ihsanulfu`ad Suwandi, Wahyu Saputra, and Sugeng Pramudibyo help to find references related this paper.

ACKNOWLEDGMENTS

The author would like to express gratitude to:

1. The faculty of Enginering for funding this seminar.
2. Departemen of Informatics that has assisted during the research implementation.
3. Information Technology Education study program that has facilitated and supported during the implementation of the research.
4. LMS SPADA UNG Team.

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