

DEVELOPING A VIRTUAL LABORATORY ON MANAGEMENT AND ENTREPRENEURSHIP COURSE TO ENHANCE DISTANCE LEARNERS' KNOWLEDGE AND SKILLS

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Abstract

This present study aims to elaborate and the use of virtual laboratories as media to deliver the course content of management and entrepreneurial substances to enhance the knowledge and syllabus of Universitas Terbuka students. The study involved several experts that include subject matter experts instructional designers ICT developers and writers. Research and development method was used in this present study. The research and development method consists of systematic and systemic steps including 1). Identity instructional goal, 2). Product instructional analysis, 3). Analysis Learner and context, 4). Write performance objectives, 5) develop instructional strategies, 6). Develop instructional material, 7). product formative evaluation, 8). Revise instruction. This multiyear research scheme resulted in the design of a virtual laboratory on management and entrepreneurial courses that was validated by experts.

Keywords: distant learner, entrepreneurship, management, virtual laboratory

1 INTRODUCTION

One of the main characteristics of conducting a distance learning program is using the media and technology. Those are used to deliver course content to students who are located separated from the instructor. The advancement of computer technology and networks provides a wide selection of instructional media to convey course substances learned by distant learners. The use of media as learning resources has to provide meaningful learning experiences for students to develop their competencies.

Universitas Terbuka (UT), one of the Indonesian higher education institutions that implement an open and distant education system, uses various media as learning resources so that the students can learn effectively. In the digital network technology era, the use of e-learning is considered one of the alternatives that can be used to deliver course content.

The term e-learning is defined as learning activities that occur through electronic devices that offer some potential benefits to support students' learning process. Many distance learning institutions in the world use various types of e-learning to support their student's learning process to gain required competencies. UT must find appropriate types of e-learning that can enhance the student's knowledge and skills.

One of the e-learning types that is selected by UT is a virtual laboratory. This kind of e-learning is considered instructional media that can enhance the skills of students in practicing certain competencies. This present article will elaborate on the use of the virtual laboratory to enhance the skills and abilities of the management study program.

The use of virtual laboratories can be viewed as the solution to solve the problem of the lack of real laboratory resources. To use the virtual laboratory effectively for students of the management study program, UT must conduct a research and development program on using virtual laboratories.

Research problems

This present study - Developing Virtual Laboratory on Management Courses to Enhance Distance Learners' Skills - will explore the following research questions.

1. How to develop a virtual laboratory on management courses to increase the knowledge and skills of students in management study programs?
2. Is the use of a virtual laboratory can enhance students' knowledge and skills in management courses?

Research objectives

This study is aimed to develop the prototype of the virtual laboratory for management and entrepreneurship course that can facilitate distance learners to enhance their knowledge and skills on the subject. In addition, the study was also intended to get information concerning the effectiveness of using the virtual laboratory.

Literature Review

Open and distance learning

With the advancements in telecommunications technologies, distance learning programs rapidly expanded so distance education is now defined as "the acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance. (Solomon, 2016).

The separation of students and instructors is the main characteristic of distance learning. To bridge the learning process the use of media and technology is a must (Smaldino. et. al. 2018). Distance education can refer to any form of learning where individuals are not physically present in a

traditional setting, such as a classroom. This form of learning offers many advantages over traditional learning, providing individuals with the ability to learn at their own pace and in their own space. In this sense, the media have an important role in the delivery use course substances or content to students.

Universitas Terbuka, the higher education institution that implemented open and distance learning, uses various types of media and technology to support its student's learning process. Media such as text-based, audio-based, video-based, and web or internet are used to enable the students to study and course substance.

Universitas Terbuka uses printed media as the main delivery system of course substances to students. The selection of the media is based on the availability to be used as learning materials. The use of printed media as learning material does not adequately support all course contents. Every medium has a specific character as a delivery system of the course content.

The practical courses offered to students required a specific type of media to be learned. The types of media for practical learning activities are required to support students of the economic faculty of Universitas Terbuka. A media with a certain attribute is necessary to support students learning process of management and entrepreneurial skills. Students need authentic learning experiences to master the skills of designing and developing a business model based on managerial and entrepreneurship. In this sense designing and developing a virtual lab is necessary to support students learning process to attain the learning goal – of developing a proper business model.

What is a virtual laboratory?

Virtual laboratories are interactive, digital simulations of learning activities that typically take place in physical laboratory settings. Virtual laboratories enable students to engage in lab-based learning exercises without the costs and limitations of a physical lab. The virtual laboratory can be an important element in institutional efforts to widen access to lab-based courses to more and different groups of students. A virtual laboratory is also defined as a computer-simulated environment in which the conditions for experimentation typical of a conventional laboratory are recreated using generic or specific computer software. (Vergara, 2022).

Anderson (2020) noted that virtual labs are interactive online environments that support simulation-based learning. They let you create real-life simulations for conducting scientific experiments or engaging in other processes that may not be practical in physical classrooms.

Hurix (2022) noted several benefits of using the virtual laboratory to support the students' learning process that includes: 1) provides easy access to use new technology, 2) serves as a visual aid to teaching complex concepts, 3) ensures student safety, 4) engages learners, 5) offers instant feedback, and 6) allows learning flexibility, 7) affordable alternative to physical labs. In addition, Anderson (2020) also noted the benefits use of virtual laboratories as follows 1) Engaging with real-life simulations, 2) Explaining complex concepts, 3) Learning in a safe environment, 4) Eliminating ethical issues, 5) Unlimited time to learn, 6) Higher motivation and engagement, and 7) Better knowledge retention

A virtual laboratory is an on-screen simulator or calculator that helps test ideas and observe results. In these online activities, students use advanced technology and media to conduct a series of experiments that yield authentic results. Virtual laboratories or virtual labs for short are the best way for students to practice in a safe, online environment. By doing virtual science lab games and engineering simulation software, students can interact with elements, machines, and interfaces before or instead of trying them out in real life.

Operating a virtual laboratory for a student must feel like they are working with real authentic devices in a real authentic space. By doing virtual laboratory students will engage in authentic learning situations in order to achieve the required learning competencies.

2 METHODOLOGY

This present study used a research and development method that employed that includes the following systematic and systemic steps such as 1) identify instructional goals, 2) conduct an instructional analysis, 3) analyse learner characteristics and context, 4) write performance objectives, 5) write performance assessment, 6) determine instructional strategy, 7) develop instructional materials, 8) design and conduct a formative evaluation of instruction, 9) revise instruction, 10) design and conduct a summative evaluation of instruction. (Borg, Gall, and Gall, 2007). These steps can be classified into three major phases – design, development, and analysis. The major phases of the study can be seen in figure 1.

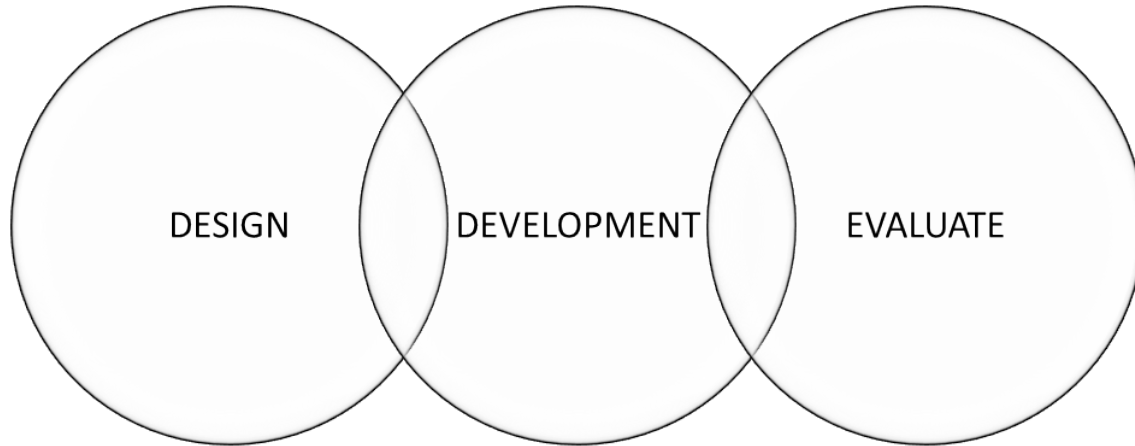


Figure 1. The major phases of the research and development model

Every phase of the study will produce some specific instructional output. The design phase, which consists of steps no 1 until step number 6, involved several experts such as a subject matter expert, an instructional designer, a media specialist, and an information and communication technology ICT expert in a series of focus group discussions.

The result of the design phase is a blueprint of the virtual laboratory program on management and entrepreneurship course for distant learners. The production and evaluation phases of the study will be conducted in the following years since this present study since this study was planned for a multi-year schema.

The output of the development phase of this present study is a draft of the virtual laboratory program on management and entrepreneurship course. The development of the program was based on the blueprint of a virtual laboratory program on management and entrepreneurship course that had already been done. The draft of the program will be formatively evaluated in the following phase of the study – the evaluation phase.

The evaluation phase will be conducted by implementing the three formative evaluation steps: one-to-one formative evaluation, small-group formative evaluation, and field-trial evaluation (Dick, Carey, and Carey, 2015). Every step of the formative evaluation will be followed by a revision process to ensure that the virtual laboratory program on management and entrepreneurship course can be used effectively by the intended target audience.

3 FINDINGS AND DISCUSSION

This research and development study was planned to be held in three following phases 1) design, 2) development, and 3) evaluation. The three phases of the design will be run in three consecutive

years. The design phase of the study, conducted in the first year, resulted the design or blueprint of the virtual laboratory program on management and entrepreneurship courses.

The goal of this present study is to create an effective and efficient virtual laboratory program that can facilitate students' learning process to practice management and entrepreneurship skills. The virtual laboratory program is necessary for students of Economics and Business of Universitas Terbuka to practice the simulation learning activities in implementing the knowledge and management skills.

The design phase of this study consists of some workshops and focus group discussions that involve some of the following experts such as 1) an instructional designer, subject matter experts, media and ICT specialists. These selected experts collaborated intensively to design the virtual laboratory program to be used by the students of Economics and Business program of Universitas Terbuka to practice the management and entrepreneurship skills.

The first step of the design phase was to determine the instructional goals of the program by analysing the course content and curriculum of the program. After completing the virtual laboratory program, the students will be able to design and develop a business plan that can be implemented in small scale business start-up that implement the principles and theory of management and entrepreneurship.

The following step in designing the virtual laboratory program was to conduct an instructional analysis process. This step was done by analyzing the previously stated instructional goals to be the sub-skills that must be attained by the students to master the instructional goals. In other words, the result of the instructional analysis process is the structure of the sub-competencies that students must learn to produce an entrepreneurial-based business model.

The result of goal analysis was used as a base for determining the substances and learning activities that students must do to master the stated instructional goals. The determined substances or learning content that should be learned by students must be relevant to predetermined learning goals. the students must learn the substances of the program systematically to attain the learning goal - producing an entrepreneurial-based business model.

4 CONCLUSION

The role of media and technology is considered crucial in conducting distance learning systems. Media and technology are used as the delivery system to bridge the separation between instructors and students in the learning process. Universitas Terbuka, the higher education institution that

implements open and distance learning systems uses printed media as the main learning resource learned by students. The use of the printed medium is not effective to deliver all types of course substances. Every medium has a specific attribute that can be used optimally to convey specific course substances.

In practicum courses, it is important for Universitas Terbuka to use the media and technology that enable students to practice and implement theories and principles taught in the courses. The use of a virtual laboratory offers the potential to facilitate students to develop the required knowledge and skills studied in courses. The use of a virtual laboratory enables the student to poses authentic learning experiences concerning the knowledge and skills learned in courses. The students will be able to practice knowledge and skills by using virtual laboratory.

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