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The Effectiveness of Learning Media Developed With the Kahoot Application on the Subject of Management Information System

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Abstract. From the lecture conditions of management information systems, it was found that the learning media used were less attractive and less interactive. Learning is centered on the teacher through a blackboard or presentation. Students become less motivated and tend to be bored in class. The development of learning media is carried out by the 4D method, namely Define, Design, Develop and Disseminate. Kahoot is a game-based interactive learning platform that can be used as educational technology in schools. Kahoot is an appropriate platform for developing learning media for management information systems courses. After developing learning media using Kahoot, researchers found that learning activities in the classroom became more interesting and interactive and motivated students to learn. To determine the effectiveness of the use of instructional media, effectiveness tests are carried out. Based on the pre-test, it was found that 28 students obtained an average score of 64.29. Then after the learning media implementation test was carried out, a post-test assessment was conducted and an average score of 79.82 was obtained. There is an increase in scores after using learning media. So, it can be concluded that the learning media developed is effective in improving learning outcomes.

1. Introduction

Management Information System (SIM) becomes an inseparable part of life today. Kenneth Laudon explains how the role of computers and the internet becomes very essential[1]. In 2011 data was obtained that business in America invested more than 1 trillion dollars for hardware, software, and telecommunications equipment to support information systems. This exceeds half of all capital investments in America. In addition, more than 450 billion dollars is for business consulting and service management. Much of it is to redesign the company's business operations to benefit from technological developments.

In line with the development of global business, in Indonesia, it already has laws that support the implementation of Management Information Systems. It is stated in the 1945 Constitution Article 28 which states that everyone has the right to communicate and obtain information to develop their
personal and social environment, and has the right to seek, obtain, possess, store, process and delivers information using all types of available channels\cite{2}\cite{3}\cite{4}.

Proving that Indonesia is an important part of the global information society. The development of information systems from year to year is growing faster along with the development of technology shows the importance of studying management information systems.

McLeod (2001) explains that management information systems or SIMs are computer-based systems that provide information for users according to their needs\cite{5}. While Gordon B. Davis (2009) argues that management information systems are humans or machines provide information to support operations, management and decision-making functions of an organization. Of the two opinions above, explained that management information systems are the management of interactions between humans, technology, facilities and various components that work for common goals\cite{6}. A well-developed management information system can increase productivity, eliminate non-useful activities, improve services, coordinate every part of the organization/company and improve the quality of decision making in management. This makes management information systems a very important science to learn in the technological era like today.

Management information systems become compulsory subjects that must be studied in universities in Indonesia. One of them is at the Ibnu Sina Batam Institute of Technology (STT), the management information system course is a compulsory subject that can be taken in the 7th semester of the informatics engineering study program and industrial engineering study program.

From the learning outcomes in the Management Information Systems course in 7th-semester students in industrial engineering study programs, 64.29% of students cannot reach the specified minimum passing limit, which is the "C" grade. The results of the midterm test show that only 10 students managed to reach above the minimum graduation limit, the remaining 18 students still received the "D" and "E" scores. A breakthrough is needed to solve these problems so that the results of learning in the classroom are achieved according to the completeness target set by the campus, namely a minimum value of "C".

| No | Class | Total Student | Score < C Amount | Score < C Percentage | Score ≥ C Amount | Score ≥ C Percentage |
|----|-------|---------------|------------------|----------------------|------------------|---------------------|
| 1  | 7     | 28            | 18               | 64.29%               | 10               | 35.71%              |

Source: Mid-semester test result of semester 7\textsuperscript{th} 2017/2018

From the observations made, it is known that teachers still rely on the use of blackboards and presentations as the main media in learning activities. The impression obtained from students is that they feel less interested in using the media because learning tends to be monotonous and lacking in variation. Teacher-centered learning not to students. Because the learning approach used by instructors and the delivery of subject matter has not been supported by the right media, it creates boredom for students. The learning process is still done conventionally without any other strategies that can trigger creativity and provoke curiosity and interaction of students in learning Management Information Systems courses.

\textit{Kahoot} is a web-based application that provides interactive services in the form of quizzes, discussions or surveys that can be used as a medium to assist in learning activities\cite{7}. With \textit{kahoot}, learning becomes more fun and not boring. The interaction between the instructor and students in the \textit{kahoot} application and the concept of learning with the game can attract students to be more active in learning and doing coursework. In the \textit{kahoot} application, there is also competition between students so that they will be motivated and compete to get better learning outcomes than other students. While viewed from the side of the subjects taught, namely Management Information Systems, this subject mostly discusses the understanding of concepts and theories, so that many practical images are needed according to those in the real world. The \textit{kahoot} application can display images and videos related to lecture material more interactively. Because of these advantages, the \textit{kahoot} application was chosen as the appropriate solution to solve the problems faced.

From all the backgrounds above, researchers felt interested in developing learning media by using the \textit{kahoot} application on subjects that were being taught by researchers. So hereby the researcher
takes the title “The Effectiveness of Learning Media Developed With the Kahoot Application on the Subject of Management Information System”.

2. Method
In this study, the model used was the development of a 4-D model. The 4-D development model (Four D) was chosen because it is a model of development of learning devices. This development model has simple, systematic procedures, according to the steps of the research carried out and involves evaluations from experts. This model was developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (1974)[8]. The 4D development model consists of 4 main stages, namely: Define, Design, Develop and Disseminate.

3. Result and Discussion
a. Define Phase
From the observations made in the class of STT Ibnu Sina Batam’s 7th semester industrial engineering study program on management information systems, all this time the lecture process still uses classical methods with limited learning media using presentation-based textbooks so that teachers have not found a way the right in presenting material that cannot be presented with the lecture method and notes especially for abstract learning material. Learning is still teacher-centered. From the learning process, it was found that during the midterm there were still many students who had not reached the minimum graduation rate set by STT Ibnu Sina, namely grade C. Of the total 28 students, 64.29% of students scored below graduation limit. The use of computer-based media has not been maximized, it is still in the form of presentation media that are used by the instructor in explaining the material in front of the class and students only pay attention to the explanations conveyed by the instructor. The media used has deficiencies, which only contain learning material without animations, images, supporting videos and exercises / quizzes in it, and do not cause interaction between students and learning media, because learning media is only operated by teachers. For this reason, it is necessary to design learning media as a learning support media for management information systems courses that can be used by teachers and students. At this stage a syllabus or semester learning plan (RPS) is set in one semester in accordance with the Indonesian National Qualifications Framework (KKNI). Broadly speaking, the contents of the syllabus are about the objectives of learning outcomes and learning matrices. Learning designed in the syllabus for one semester is briefly explained in the subject for each meeting as shown in table 2.

| Pertemuan | Materi |
|-----------|--------|
| Pertemuan 1 | Pengcompian Silabus dan Sasran Acara Perkisihan |
| Pertemuan 2 | Konsep Dasar Sistem Informasi |
| Pertemuan 3 | Komponen Sistem Informasi Manajemen |
| Pertemuan 4 | Komponen Sistem Informasi Manajemen |
| Pertemuan 5 | Komponen Sistem Informasi Manajemen |
| Pertemuan 6 | Data Base |
| Pertemuan 7 | Analisis dan Pengembangan Sistem Informasi |
| Pertemuan 8 | Ujian Tengah Semester (UTS) |
| Pertemuan 9 | Ujian Akhir Semester (UAS) |
| Pertemuan 10 | Ujian Akhir Semester (UAS) |
| Pertemuan 11 | Ujian Akhir Semester (UAS) |
| Pertemuan 12 | Ujian Akhir Semester (UAS) |
| Pertemuan 13 | Ujian Akhir Semester (UAS) |
| Pertemuan 14 | Ujian Akhir Semester (UAS) |
| Pertemuan 15 | Ujian Akhir Semester (UAS) |
| Pertemuan 16 | Ujian Akhir Semester (UAS) |

In Piaget's cognitive development theory, adolescence is a transition stage from the use of operational thinking to concrete operational thinking. Teenagers begin to realize the limits of their minds. They try with concepts that are far from their own experience. Inhelder and Piaget (1978) recognize that brain changes at puberty may be needed for adolescent cognitive progression[9]. Students in this case are 7th semester students included in the formal operational category which is able to think abstractly and be able to analyze problems scientifically and then solve problems.
The goal of learning achievement in management information system courses related to IQF is after participating in this lecture for one semester, students are expected to:
1) Understand the theoretical concepts of management information systems
2) Understand and be able to identify information needs at each level in the organization
3) Having the ability to describe and analyze various aspects of information systems in the organization.

b. Design Phase
Before doing the design, we first determine the method that will be used in the lecture, as in Figure 1 and Figure 2. Then we make a more specific one for the learning media that we develop.

Figure 1. Block Diagram Of Learning Method

Figure 2. Block Diagram Of Detail Class Session

Figure 3. Video Intro

Figure 4. Starting Media

Figure 5. Interactive Quiz

Figure 6. Quiz Result

Figure 3-6 shown the display of the developed learning media with kahoot application.

c. Development Phase
This development phase aims to produce effective learning media. Pre-test and post-test were conducted to determine the effectiveness of the learning media developed. According to Uno (2012) indicators of effective learning can be known from the learning achievements of good students[10]. Instructions for the success of learners can be seen that these students master the subject matter given. Furthermore, the level of mastery of material in the concept of complete learning according to Trianto (2010) is classical completeness, ie learning can be said to be complete if in a class there are ≥ 85% of students who have completed their studies[11].The standard applied in Ibn Sina's STT as a minimum completeness value is if the final value of the management information system course is at least C, that is the value equal to or above 70. Students who have a value of> 70 means complete in the
Management Information System course. While students who have a value of <70 means that it is not complete. To measure classical completeness, a percentage formula is used, namely:

\[ \% = \frac{f}{N} \times 100\% \]

Information:
\( \% \) = percentage
\( f \) = number of students who complete study
\( N \) = number of all students in one class

With the criteria if in a class there is an increase of 85% of students who have completed their study then the learning is said to be effective. Likewise, if there are <85% of students who have completed their studies then the learning is said to be ineffective.

Table 3. PRE-TEST AND POST-TEST RESULT

| No | NIM    | Nilai Pretest | Nilai Posttest |
|----|--------|---------------|---------------|
| 1  | 1410128425038 | 45            | 80            |
| 2  | 1410128425042 | 65            | 70            |
| 3  | 1410128425047 | 65            | 65            |
| 4  | 1410128425107 | 75            | 85            |
| 5  | 1410128425108 | 80            | 90            |
| 6  | 1410128425110 | 55            | 70            |
| 7  | 1410128425111 | 70            | 80            |
| 8  | 1410128425116 | 60            | 90            |
| 9  | 1410128425118 | 55            | 75            |
| 10 | 1410128425120 | 80            | 90            |
| 11 | 1410128425125 | 70            | 90            |
| 12 | 1410128425128 | 70            | 90            |
| 13 | 1410128425130 | 75            | 70            |

The effectiveness of learning media is seen from the comparison of the results of the pre-test and post-test. If there is an increase in results, it can be concluded that the use of the media is "effective". Can be seen in table 3. Of the 28 students, the results of the average pretest score were 64.46 and only 35.71% were completed, while the results of the post-test average score were 79.82 and the completeness level was 96.43%. So it can be concluded that the use of learning media developed with kahoot is effective.

d. Disseminate Phase
Is the final stage of development. The dissemination stage is carried out to promote development products so that they can be accepted by users, both individuals, groups, or systems. Manufacturers and distributors must be selective and work together to package the material in the right form. According to Thiagarajan et al. (1974: 9), "the terminal stage of final packaging, diffusion, and adoption are most important although most often overlooked." Dissemination is done in other classes with the aim of knowing the effectiveness of using the device in the learning process. Spread can also be done through a process of transmission to related learning practitioners in a particular forum. This form of dissemination with the aim of getting input, correction, advice, assessment, to perfect the final product development so that it is ready to be adopted by product users.

4. Conclusion
The results of this research are the developed learning media using kahoot application in the subject of Management Information Systems proven to be effective. Teachers can use this interactive learning media as a tool to convey material in the classroom by first understanding the instructions for use and understanding the use of computers as the main equipment for operating this learning media. This learning media is displayed using a projector so that it can be displayed in front of the class. Learners can use this learning media interactively in the classroom using smartphones, tablet computers or laptops.
References

[1] K. C. L. and J. P. Laudon, “Management information systems: Managing The Digital Firm (15th Edition),” 2018.
[2] G. B. Davis, “Information Systems Conceptual Foundations: Looking Backward and Forward,” Organ. Soc. Perspect. Inf. Technol., 2000.
[3] D. Puyada, G. Ganefri, A. Ambiyar, R. E. Wulansari, and B. Herawan Hayadi, “Effectiveness of interactive instructional media on Electrical Circuits,” Int. J. Eng. Technol., vol. 7, no. 2.14 Special Issue 14, 2018.
[4] B. zul azmi, B. H. Hayadi, “Design of Expert System to Determine Stock Investment Using Forward Chaining Method,” Jour Adv Res. Dyn. Control Syst., vol. 10, pp. 1869–1873, 2018.
[5] Undang undang Dasar Republik Indonesia, 1945.
[6] R. Mcleod, “Management Information Systems Chapter 8,” in Management Information Systems, 2008.
[7] İ. Ü. Y. and F. Karakoyun, “Gamification in Biology Teaching: A Sample of Kahoot Application,” Turkish Online J. Qual. Inq., 2017.
[8] and O. Thiagarajan, Sivasailam, “Instructional Development for Training Teachers of Exceptional Children: A Sourcebook,” 1974.
[9] J. Piaget, “Piaget’s theory,” vol. Vol. I His, 1983.
[10] H. B. Uno, “Assessment Pembelajaran,” Bumi Aksara, 2012.
[11] Trianto, “Mendesain Model Pembelajaran Inovatif-Progresif: Konsep, Landasan, dan Implementasinya pada Kurikulum Tingkat Satuan Pendidikan (KTSP),” Jakarta Kencana Prenada Media Gr., 2010.