

Applying AHP to Classify Undergraduates Student's Behavior Towards E-Learning

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Abstract. This study aims to determine the level of student behavior towards the use of e-learning. This study uses the Analytical Hierarchy Process method and the help of MS. Excel to process data with a population of students of the Faculty of Economics and Business, the University of Tadulako, and a sample of 84 respondents' class of 2018. Data collection techniques were carried out using the help of the Google form application to create question instruments with a Likert scale and then the link was distributed to students. The criteria used are Easy to Learn, Easy to Use, Flexibility, and Innovation. While the alternatives were chosen are Interest, Motivation, Achievement, and Effectiveness. The results obtained alternative motivation as an alternative with the highest weighting with a global weighting level of 2,033 ranked first, ranking second alternative interests with a global weight of 1,066, for the third-ranking occupied alternative achievements with a global weight of 0.565 while alternative effectiveness ranked last with a global weight of 0.336. Researchers focus on research on e-learning Schoology using the AHP method to classify student behavior in the use of e-learning.

Keywords: *AHP, undergraduate students, behavior, E-learning*

INTRODUCTION

In the world, the rapid development of Information and Communication Technology (ICT) has influenced different fields of human life. That has led to changes in Indonesia's national education system. Based on the Constitution of the Republic of Indonesia, the education system works to develop students' potential for knowledge, skills, creativity and democracy, and responsible people. Through this, there needs to be

an education program dedicated to advancing the education of the nation's future generations. As such, information technology will provide solutions in the field of national education for the creation of learning models focused on e-learning.

Since the 1970s, e-learning has begun different terms are used to express opinions or ideas on electronic learning, including online learning, internet-enabled learning, virtual learning, or web-based learning [1]. Elearning as a medium of learning delivery that includes all learning, teaching, and instruction activities through the Internet, Intranet, Ethernet, video, tape recorder, or CD-ROM via electronic media [2]. Students can improve learning effectively and efficiently with the e-learning-based learning process and can interact flexibly with lecturers, even though they are not in the classroom learning activities, through internet access in learning and adjusted for student time available. E-learning benefit determinants have influenced perceived usefulness, perceived satisfaction, and use [3]. In line with the most recent research, students' intention increased due to perceived usefulness, teaching practices, and intrinsic factors [4].

E-learning mechanism offers information to students using internet devices, intranets, or other networks [5]. E-learning refers to the use of internet technology to send a series of solutions that can improve the knowledge and skills of the students [6]. Previous researchers have conducted several studies on interest, motivation, achievement, and effectiveness in the e-learning-based learning process. Motivation can affect e-learning learning, so it can be applied to the secondary and higher education scales [7]. Meanwhile, the more complex website-based learning processes are clarified, the greater the learning impact students achieve. The application of multimedia-based e-learning will increase the interest, skills, and behavior of the students towards the presented content [8]. However, several other studies indicate that the effects of

learning styles and forms as well as students' learning styles on e-learning have no significant impact on achievement [9].

Other work showed that cultural aspects affect how teachers behave in the class to enhance learning and outcomes for students [10].

METHOD

The emphasis of this study is the application of the Analytical Hierarchy Process (AHP) to characterize student actions towards e-learning use. The subjects and objects in this study were students at the Faculty of Economics and Business, Tadulako University in Palu, Central Sulawesi Province, Indonesia. The sampling technique was conducted randomly with a minimum of 84 respondents. While the sampling technique was conducted using a Google form to create a questionnaire using a Likert scale and to disseminate links to the students to complete the questionnaire. The results will be analyzed using the Analytical Hierarchy Process (AHP) method after data collection. Using this approach may help to determine the priority order of an issue is taken as a form of decision-making.

RESULT & DISCUSSION

The system of applying the Analytical Hierarchy Process method in research classifying student behavior towards the use of e-learning can be done using the following procedure, based on the results of the analysis that was done. The first stage of this research is to decide the types of parameters that are used to rank in classifying student conduct against e-learning use. Interest is the first criteria proposed since students must first have the will to learn through electronic learning or e-learning. Students require high motivation and vision and desire to engage in e-research research. Students can study outside of class hours and can do so anywhere they are connected to the Internet. Then the last is innovation, with the expectation that students will be able to use e-learning tools to add new knowledge, skills, and experience. After the criteria have been defined, the next step is to decide the subcriteria and alternatives that will be used as the basis for the decision-making of several criteria, sub-criteria, and above-determined alternatives, then the next step is to construct a hierarchical structure that will be used as a decision-making instrument.

Table 1. Local Weight and Global Weight

Weight of Criteria	Weight of Sub Criteria	Global Weight
(0.266) EL	EL 1 (0.555)	0.147
	EL 2 (0.126)	0.003
	EL 3 (0.082)	0.021
	EL 4 (0.237)	0.063
(0.508) EU	EU 1 (0.550)	0.279
	EU 2 (0.118)	0.059
	EU 3 (0.083)	0.042
	EU 4 (0.249)	0.126
(0.141) FX	FX 1 (0.266)	0.037
	FX 2 (0.508)	0.071
	FX 3 (0.141)	0.019
	FX 4 (0.084)	0.011
(0.084) IV	IV 1 (0.207)	0.017
	IV 2 (0.110)	0.009
	IV 3 (0.616)	0.051
	IV 4 (0.068)	0.005

Table 1. describes that each alternative defines global weight for various parameters. Global weight is obtained when the weight of the criteria is **Easy to Learn (EL)**

The ease of learning criterion notes that students can quickly access e-learning, but have difficulties in applying for e-learning. As a result, students still frequently ask questions about how to use the e-learning system. The results obtained from the blended learning approach showed positive perceptions of the learning [11]. Hence, with the existence of mixed learning so that teaching and learning can increase the motivation of students. Ease of learning is positively correlated with e-learning-based learning [12]. The majority of e-learning participants argue that ease of learning is essential and agree that ease of learning influences their use of e-learning [13]. The advantages of e-learning as a leader in learning skills among students [14].

Easy to Use (EU)

AHP used to characterize student conduct towards e-learning describes that most students appear to be able to quickly access knowledge and have the capacity to operate e-learning. However, when asked about the method of sending assignments or quizzes, most students expressed doubts because there were no updates received during the sending assignments method. E-learning is easy for students to use depending on the needs of lecturers and learners [15], [16], the results show that technological tools are appropriate for use in case-based e-learning. But the challenge to be faced in the future is content on e-learning. the use of e-learning has a strong impact on students' motivation [17].

multiplied by the weight of each subset of criteria or alternatives.

Flexibility (FX)

Table 1 shows that students are very sociable in e-learning, as students and lecturers can do the teaching and learning process remotely through this e-learning program, and can do it anywhere and anytime. Online-based learning provides learning versatility and can be accessed anywhere and anytime through the involvement of students and lecturers [18]. Learning Flexibility Index provides a proven tool for investigating the important role of learning flexibility in education, management, and personal development [19]. Even the most specialized educational programs, with different learning styles, have curricula that require lessons. E-learning affects greatly the versatility of the learning process and style [20]. A flexible learning framework has helped educate nurses in different countries living in the mountains [21].

Innovation (IV)

Most of the students reported after doing research that they really liked e-learning-based learning and the material presented was really interesting through visualization and planned to continue learning in the future. This is consistent with Rodica et al. [22], a collaborative relationship exists between students and companies. Collaborative means universities have competent and qualified students in the use of technology, and universities are provided by businesses with valuable experience.

Another thing revealed in the study of Darien Rosssister [23], which reported that the e-learning based learning process had a substantial relationship with student activities.

Table 2. Final AHP

Criteria/ Attribute	EL1	EL2	EL3	EL4	EU1	EU2	EU3	EU4	FX1	FX2	FX3	FX4	IV1	IV2	IV3	IV4
Interest	0.15	0.03	0.02	0.06	0.15	0.03	0.02	0.07	0.07	0.14	0.04	0.02	0.06	0.03	0.16	0.02
Motivation	0.28	0.06	0.04	0.12	0.28	0.06	0.04	0.13	0.14	0.26	0.07	0.04	0.10	0.06	0.31	0.03
Achievement	0.08	0.02	0.01	0.03	0.08	0.02	0.01	0.04	0.04	0.07	0.02	0.01	0.03	0.02	0.09	0.01
Effectiveness	0.05	0.01	0.01	0.02	0.05	0.01	0.01	0.02	0.02	0.04	0.01	0.01	0.02	0.01	0.05	0.01

Table 3. Overall Composite Weight

Attributes	Global Weight of Attributes	Rank
Interest	1.066	2
Motivation	2.033	1
Achievement	0.565	3
Effectiveness	0.336	4

Table 2. explains that each alternative above is multiplication between the weight of criteria and weight of alternative. Then, after multiplying all the data from each alternative is added to get the global weight of each alternative available and the results of the sum are used as a basis for decision making.

Table 3 describes the findings obtained from research on the application of AHP to identify student behavior towards the use of e-learning, researchers found that the level of student behavior towards e-learning is influenced by several factors with the highest level of significance influenced by alternative motivation with a global weight value of 2,033 and placed first among the four and was ranked first of the four alternatives chosen. Then, students chose alternate interests with a global weight value of 1,066 in second place. Whereas students chose alternative achievements in the third and fourth ranks with a total global weight of 0.565 and alternative effectiveness with a total global weight of 0.336. These results are consistent with several studies reported by previous researchers, namely Effects of e-learning on student motivation [24]. A study by Abbas Pourhosein Gilakjani found the use of e-learning affects student behavior, in particular, in terms of the students' encouragement and interest in using e-learning [8].

Interest

There is a very high interest from students in e-learning. It is demonstrated by the feedback from e-learning students, who agree more with the presence of this program and can increase their interest. This e-learning system is also fun for students taking part in e-learning to learn things about the lecture material. Playing the role of direct interest in learning English is very important because of the high concentration level, which makes learning exciting and results in better grades. This is similar to what was articulated by Hsiu-Li Liao and Hsi-Peng Lu [25], their study claim that e-learning has an impact on both the secondary, higher education, and employment sectors.

obtained from the product of the **Motivation**

Table 3 defines participants in e-learning as being highly motivated to complete the task and pleased with the outcomes that they have achieved. There are also weaknesses in this e-learning application system, as this system provides too much information to make it difficult for participants to take important ideas. The participants in e-learning have agreed that this e-learning program is of interest to them. Encouragement may have an impact on e-learning so that it could be extended to the scale of secondary and higher education [7]. A similar opinion has been expressed by Harandi [23], she argued that there is a significant connection between learning and motivation based on e-learning. From inspiration so that students are more likely to apply e-learning to learning every day. This is consistent with the study findings that have been performed that alternative motivation is one of the student habits with the highest global weight when using e-learning.

Achievement

In this case, it is shown in table 3 that alternative achievement ranks third out of some of the alternatives above, e-learning based learning is very influential on student achievement. Web-based e-learning is an efficient means of enhancing student academic performance in the learning process [26]. Then, mixed learning implementation has a positive effect on student achievement [27]. There were statistically significant differences between the experimental group and the control group which supported the experimental group taught using blended learning. Additionally, the group's students have a good outlook on using blended learning. This is verified by Zare et al. [28] when their study was undertaken at Payame Noor University Hamedan, Iran, examining the effect of e-learning on the innovation and information quality of chemistry students. The results suggest that there is a significant relationship between chemistry students with the acquisition of creativity and

knowledge and that greater opportunities for e-learning should be provided for a wider range.

Effectiveness

Student behavior on effectiveness in this study ranks last of the four alternatives, but there are many studies that state there is an influence on the use of e-learning on effectiveness. Learning efficiency can vary from student to student. The study results showed that the e-blackboard-based learning process at the University of the UAE positively affected student attitudes and learning performance through the use of e-blackboards [29].

CONCLUSION

The result of this study shows that the level of student behavior towards the use of e-learning is influenced by first ranked motivational factors with a total global weight of 2.033. The results of this study are consistent with several other studies, indicating that there is a significant relationship between learning and motivation based on e-learning. While the students are more likely to incorporate e-learning in everyday learning from encouragement. It is consistent with the study findings that have been done that alternative motivation is one of the student activities with the highest global weight in the use of e-learning. the importance of student achievement is positively associated with their motivation and learning achievement. The findings of this analysis are intended to be in the future a contribution to the learning cycle for stakeholders.

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