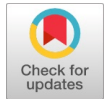


Analyzing the Influence of E-Learning System on Student Satisfaction Through Self Determination Theory (SDT)



Damar Fatika Sati, Agus Efendi, Sri Sumaryati

Abstract: Research on student satisfaction on e-learning services has been widely conducted in developed countries, but only a few have conducted similar research in developing countries, including Indonesia. In Indonesia, e-learning has been applied in education, particularly at the university level. This research aims to identify the factors that influence student satisfaction in e-learning services, the role of e-learning in learning, and the supporting factors for e-learning satisfaction. E-learning has several types, but the most used in education is the Learning Management System (LMS). The research method employed is a descriptive qualitative study on LMS SPADA. Researchers used interview and observation techniques with 30 students who have used LMS for learning. The measurement of satisfaction in this study utilises Self-Determination Theory (SDT), examining three key variables: autonomy, competence, and relatedness. Furthermore, the research process on student satisfaction with e-learning has yielded positive results. Students are satisfied with the use of e-learning in their studies. The results of this study indicate that to achieve student satisfaction, all matters related to the application of e-learning need to be well prepared, especially those related to variables in SDT. The implication of this research is for all educators, students, and universities that have implemented e-learning, especially the universities studied.

Keywords: E-learning, Indonesia, Learning Management System (LMS), Satisfaction, Self Determination Theory (SDT)

I. INTRODUCTION

As time passes, the evolution of technology continues to develop rapidly, influencing numerous aspects of life, particularly education. Technological advancements have led to the development of novel and creative learning models in the educational process [1]. Currently, the world of education is entering the 21st century, and the presence of technology is one of the primary assets for learning in this century. Teachings for 21st-century students require educators to adjust their teaching strategies, models, and methods to the characteristics that suit this generation. A notable trend in this

century is the shift from traditional teaching methods to technology-based instruction [2]. According to a study by Effendi and Wahidy (2019), the advancement of information and communication technology has had a significant impact on the world of education, particularly in the learning process. As a result, it is necessary to implement and adapt technology in learning environments to address these adjustments.

II. LITERATURE REVIEW

Electronic learning, also known as e-learning, is one of the many alternative technologies that can be utilised in the teaching and learning process. The use of learning methods that utilise electronic applications and the internet is commonly referred to as e-learning [2]. The impact of Industrial Revolution 4.0 is the emergence of cyber-physical systems and the internet in the field of education, as evidenced by the increasing development of computer-based teaching, which has penetrated online learning and the use of e-learning media [3].

E-learning is the process of acquiring knowledge using a particular online resource that provides basic features for flexible interaction, scalability, and standardization [4]. According to Hoq (2020) [5], e-learning is a virtual education system facilitated by information technology. By using e-learning, learners have the right to access various learning resources and information that support learning freely [2]. E-learning has several types, but the most used in education is the Learning Management System (LMS).

During the COVID-19 epidemic, there was an increase in the use of e-learning in education. By that time, e-learning was one of the most effective alternatives for distance learning. Although the COVID-19 epidemic has come to an end, e-learning continues to remain in use. As the COVID-19 pandemic has ended, e-learning platforms are still necessary, as nearly all educational institutions have adopted this system [6]. Although education can still be delivered through face-to-face or direct interaction, e-learning enables educators to leverage technology-based learning. Hence, students' needs can be satisfied both in offline and online learning by using gadgets or computers to explore the subject matter.

The term satisfaction is made up of two words: 'satis', referring to well enough or adequate, and 'facto', which means to make. According to Al Munawar and Fuadaturrahmah (2021), the simplest definition of satisfaction is the attempt to make something suitable or fulfil a need. The user's satisfaction is the fulfilment of the user's desires, which makes the user

Manuscript received on 28 August 2023 | Revised Manuscript received on 05 September 2023 | Manuscript Accepted on 15 September 2023 | Manuscript published on 30 September 2023.

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feel pleased with a product or service [7]. The satisfaction parameter is used to determine the level of student satisfaction with e-learning in learning service efforts [8]. The level of user satisfaction with the system reflects the system's quality. A well-qualified learning experience will provide a high level of satisfaction for its users [9]. One of the indicators of the successful development and implementation of e-learning is user satisfaction, as perceived by both lecturers and students [10].

Like any other learning instrument, e-learning must be evaluated to determine how user satisfaction, effectiveness, and efficiency influence its adoption in education [8]. Research on the quality of e-learning services that impact student satisfaction has been conducted in many major countries, including Vietnam, Saudi Arabia, and Zimbabwe. The study findings on e-learning user satisfaction by Pham (2019) [11] in Vietnam indicate that the quality of the e-learning system influences various factors, including the quality of teachers and subject matter, as well as the quality of other supporting administrative services. The quality of service is positively associated with student and educator satisfaction, which in turn affects their loyalty to using e-learning. According to research by Hoq (2020), teachers' traits have a significant positive impact on the use of e-learning in the classroom. Efforts may be made to increase student satisfaction by identifying e-learning service quality characteristics that influence satisfaction while using e-learning for learning purposes.

In addition, similar research was also conducted by Dangaiso (2022) [12], which examined the quality of e-learning services, student satisfaction, and loyalty from the perspective of universities in Zimbabwe. The study found that the quality of e-learning services affected student satisfaction. This was also evident in the level of student satisfaction, which reflected the students' devotion to online learning. This research recommends that higher education design an e-learning system that enhances accessibility, navigability, and flexibility for users.

Referring to previous research, a gap exists between student satisfaction with e-learning. This research focuses on the implementation of e-learning in education. Researchers would analyse the factors used to measure aspects of user satisfaction when using e-learning. The satisfaction aspect of this research is viewed from the student's perspective. This research aims to analyse the reality of technology-based learning at a university in Indonesia. The subject of this research focuses on students' perspectives on the use of e-learning technology.

The objectives of this research also encompass how students view the use of technology in 21st-century education. Moreover, this study aims to identify the factors that most significantly affect student satisfaction when using e-learning. This research is necessary for evaluating data on learning at the university level to identify gaps in the learning process using e-learning. Thus, it can determine the policies and improvements made during the learning process. The implications of this research are relevant to all universities that implement e-learning, particularly those studied in this research.

III. METHODOLOGY

The research method employed in this study is qualitative, with a descriptive approach. Qualitative descriptive research is a process of collecting data by observing the facts of the field, aiming to interpret the phenomena or events that occur [13]. Qualitative research emphasizes the accuracy and adequacy of the data. The emphasis in qualitative research is on data validity, specifically the compatibility between the data recorded and the actual events that occur in the context under study [14].

This method is used to address research on student satisfaction when using e-learning, the role of e-learning in learning, and the supporting factors for e-learning satisfaction. Researchers employed interview techniques and field observations to study students who have applied e-learning, specifically the LMS SPADA, to learning for approximately three years. This research was conducted at a university in Indonesia, with the research subjects being students who actively use e-learning in their learning.

The satisfaction measurement used in this study is based on the Self-Determination Theory (SDT) by Deci & Ryan (2008). SDT is a psychological framework that focuses on the motivation behind human behaviour. There are two types of motivation in humans: intrinsic and extrinsic motivation. SDT examines intrinsic human theory through three variables: autonomy, competence, and relatedness. According to this hypothesis, when three essential psychological requirements are satisfied, individuals achieve higher psychological well-being, namely autonomy, competence, and relatedness. The success of fulfilling these three variables can affect individual satisfaction and encourage engagement in learning activities [15].

Several questions were asked regarding the role of e-learning in education, the features that most assist students in their learning, and the level of satisfaction students experience with e-learning. The data were obtained through interviews and observations. The questions about the role of e-learning in learning were obtained from interviews and document analysis to reinforce the initial questions. The following question is related to the supporting factors of e-learning satisfaction, for which data was obtained from interviews and observations. Additionally, the endeavour to improve and understand the effectiveness, efficiency, and user satisfaction of the system used involves conducting an evaluation.

IV. RESULT

A. The E-learning role in Learning

In the process of collecting data through interviews, the researcher's preliminary step was to ask about the students' experiences of using e-learning in their learning. This initial question was asked about how far students could express their learning process by using e-learning. The following quote is "...So far, the experience of learning with e-learning is quite interesting and fun...". E-learning is also an alternative application of technology in learning. The quotation is "...E-learning becomes an innovative and

varied learning solution, not only by monotonous learning or in conventional ways."

The researcher used observational data collection to gather information by observing the university's teaching and learning activities. The findings from the researcher's investigations indicate that so far, the learning process with e-learning is highly supportive of learning. At this university, e-learning is a crucial component of the educational process. The quotation is, "...The e-learning role in learning is sufficient to facilitate the learning process anytime and anywhere, e-learning is one of the learning media that facilitates online learning and complements face-to-face learning "...In fact, it is possible to maximize students' learning results if they can make optimal of using e-learning. As supported by the quote, "...I make the best use of e-learning for learning, especially during exams. I can revise or review the material from e-learning."

Researchers also questioned the effectiveness of e-learning in learning. As proven by the quote, "...Overall, offline and online learning using e-learning remains effective because of the sophisticated features in it...". It is undeniable that the e-learning system has features that support the learning process.

B. The Factors that Influence Satisfaction

The ability to access e-learning at any time and from any location is one of the most essential factors for students. It is widely recognised that students have diverse learning techniques and styles. As proven by the quote "Learning with e-learning is more flexible in managing study time so that you can study anytime and anywhere ...". E-learning implementation grants students the full right to adjust their own study time. The quotation is "...With LMS I can manage and control my study time without time restrictions." Additionally, another student mentioned that "There are features that can house material that has been grouped by subject to be more structured, so I am not confused in looking for material." This statement is in line with the questions asked by researchers regarding what features are most helpful to students in learning. A total of 19 students argued that the subject material availability feature is the feature that helps students the most in managing learning materials.

Researchers also questioned students regarding the availability and quality of materials on e-learning. One university student said, "The materials in e-learning are organized, structured, and efficient...". This statement indirectly indicates that the e-learning features have been functioning well. Nevertheless, there is a weakness in the implementation of e-learning systems in education, which is the monotonous nature of the learning content. The quotation is "The material provided in e-learning is structured but not variable...". The material content presented in e-learning has an indirect influence on students' understanding during the learning process. Other students also have similar words. The quote is, "The material provided has minimum relevance to the material, mostly only in the form of PDF or PPT."

The researcher attempted to gather more information from the students by asking whether the e-learning system impacted their learning outcomes. Some students answered that the use of e-learning in learning can enhance their learning outcomes. As proven by the quote, "Learning with

e-learning makes it easier for us to be able to choose study time independently and according to personal preference, which indirectly affects our learning outcomes...". The strategies that students use in learning will be different from one student to another. Therefore, e-learning is available to facilitate students' learning according to their plan. Students' learning time is also optimised when using e-learning platforms. Thus, it will improve student learning outcomes.

Overall, the research on student satisfaction with e-learning has yielded favourable results. Students are generally satisfied with the use of e-learning in education. However, based on direct observation conducted by the researcher on November 24, 2023. The quality of the e-learning system can be enhanced in several ways, including the user interface. The user interface on this e-learning is considered insufficient. The quotation is "The display on e-learning should be made more interesting and not boring".

C. Supporting Factors for Satisfaction

Infrastructure, the quality of the accompanying teacher, and the overall quality of e-learning all have an impact on student satisfaction. Without these three factors, students will not be delighted in using e-learning. Based on the interview results, after using the e-learning system for approximately three years, it becomes apparent that the system has defects that are inherent to it. Some features occasionally do not function as intended. The quote is "Sometimes the system has an error or the system is down." Furthermore, the role of accompanying teachers has a significant influence on students' use of e-learning. Proven by the quote, "... Learning done with e-learning is only one-way, so there is a little lack of interaction between teachers (lecturers)". Proven by the statement, "...The chat feature enables students to interact and discuss with one another easily. In addition, facilities or infrastructure used to support the use of e-learning as a learning tool must be ensured to be available adequately. The quotation, "...Weak internet connections and WiFi signals can occasionally pose issues for students trying to complete online courses."

V. DISCUSSION

Based on the research results associated with *Self-Determination Theory (SDT)*, it is evident that the *autonomy variable (individual needs for a sense of control over their actions)* [15] has been successfully implemented in the LMS type of e-learning studied. E-learning allows students to organise their own study time. Moreover, e-learning also provides opportunities for students to manage and determine their learning strategies without any coercion from others. E-learning also provides students with the opportunity to discuss with their peers and express their ideas.

The competence variable (the need to feel effective in interacting with the surroundings) [15], in the LMS studied, is applied to the "deadline" feature. With the deadline, students will be motivated to be more diligent in their learning, making their learning time more effective. According to Haukås (2023) [16], competence is related to student perceptions of the

ability to understand and master the material conveyed. In the LMS studied, it has demonstrated its ability to facilitate students' understanding of the material being conveyed.

The relatedness variable (the need to feel connected with others) [15] is supported by the implementation of the "chat" feature, which enables students to interact with each other about the same problems or obstacles encountered in lectures. Students can communicate with each other and discuss to solve problems. The implementation of learning using technology will contribute to and enhance the learning experience, thereby positively affecting student satisfaction with the e-learning system [17].

Potential consumers' expectations regarding how hassle-free a new system should be determined how easy it is perceived to operate [18]. Students do not experience any difficulties in using the e-learning system. The user interface prioritises the quality of the display, including the selection of colours, layouts, and images, to produce a pleasing and attractive appearance for users. In implementing the learning process through e-learning, universities must prepare all necessary infrastructure and strategies to support the implementation of e-learning. The learning process using e-learning is closely related to access time, material, learning design, and assignments [3]. The results of the research showed that the university studied has prepared infrastructure that supports e-learning, including WiFi connections for internet access and computer lab facilities.

In the implementation of content variables in the Green and Pearson model, students are satisfied with the use of e-learning, particularly with the various features it offers. Features of e-learning that are available include text, visuals, videos, discussion forums, assignments, chat, quizzes, and other formats. However, several factors need to be considered to achieve student satisfaction, including improvements to the display or user interface. According to Koderi & Guntur Cahaya Kesuma (2023) [19], providing an exemplary user interface requires collaboration between designers and users to produce a desired display. To develop quality e-learning and support learning, it is necessary to optimise a more varied range of presentation methods [20].

Developing the necessary strategies for teaching and learning requires an understanding of learning styles [21]. Teachers must be able to determine which strategies are suitable for the students they are teaching. In addition, learning through e-learning is considered more effective, especially since the users under study are high school students who are accustomed to technology-based learning. The implementation of e-learning in learning will enhance the effectiveness of learning [20]. An advantage of using e-learning that students like is the material feature, which is accessible anytime and anywhere. The e-learning platform can be accessed anytime from anywhere and is material-immersive [19].

Student satisfaction with e-learning is closely linked to the quality of the e-learning system. As stated by Dangaiso (2022) [12], student satisfaction is primarily determined by the quality of e-learning, which involves having understanding provided in an easily accessible, understandable, and up-to-date format. System quality, according to Hernita et al. (2020) [22], is a measurement system that emphasises the information process outcomes of

user and system interactions. It can be concluded that user satisfaction refers to an individual's sense of pleasure or disappointment after using the system [23].

The essential role of teachers in the learning process is paramount when utilizing e-learning. Teachers and students' interactions are still considered inadequate. Learning using e-learning has an impact on decreasing the value and character of students. It results from a lack of face-to-face communication between students and teachers or among students themselves. In other words, e-learning often overlooks social aspects. The learning paradigm is shifting. The role of the teacher has shifted, no longer as the sole source of learning. However, the teacher remains the guide in the learning process [2]. In keeping with the belief [6] that the instructor serves as a crucial guide for the students during this learning process. Teachers need to demonstrate examples to students before allowing them to try it on their own. Although the students who use e-learning are upperclassmen, teachers need to monitor their students' progress.

VI. CONCLUSION

According to the overall study's findings, the use of e-learning for learning improves student satisfaction. The results of measurements using Self-Determination Theory (SDT) show that the autonomy variable has been applied in the e-learning LMS due to its flexible features. The competence variable in the e-learning system needs to be proven by the "deadline" feature. The "chat" feature supports the relatedness variable. SDT theory suggests that to achieve a level of user satisfaction, all three SDT variables must be fulfilled. Students' most preferred e-learning feature is the flexibility of using e-learning, which can be accessed anytime and anywhere. Moreover, e-learning helps students organize their time and determine their learning strategy. To ensure student satisfaction with e-learning, all aspects of e-learning implementation must be thoroughly planned and executed. Providing teachers with the tools they need to develop innovative and novel lesson plans is one approach to enhancing student satisfaction with e-learning. Moreover, it is necessary to optimise supporting factors, such as improving the display of the user interface, enhancing the internet connection's capability, and improving the quality of the e-learning system.

DECLARATION STATEMENT

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

- **Conflicts of Interest/ Competing Interests:** Based on my understanding, this article has no conflicts of interest.
- **Funding Support:** This article has not been funded by any organizations or agencies. This independence ensures that the research is conducted with objectivity and without any external influence.
- **Ethical Approval and Consent to Participate:** The content of this article does not necessitate ethical approval or consent to participate with supporting documentation.



- **Data Access Statement and Material Availability:** The adequate resources of this article are publicly accessible.
- **Author's Contributions:** The authorship of this article is contributed equally to all participating individuals.

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