

Evaluation of the Use of Learning Management Systems on Herbal Medicine Topics based on the Level of User Satisfaction and Increased Knowledge

Firdaus¹, Zulharman¹, Augyera Reinatasya Seandrio²

¹Department of Medical Education, Faculty of Medicine, University of Riau

²Faculty of Medicine, University of Riau

*Correspondence: dr.firdaus@lecturer.unri.ac.id

ABSTRACT

The learning management system is a platform that helps deliver content online for learning purposes. Not all students can study herbal medicine in the Faculty of Medicine, University of Riau elective block. Thus, LMS as a forum for students to carry out independent learning needs to be evaluated. This study aims to determine the success of the LMS developed on the topic of herbal medicine based on the level of user satisfaction and increased knowledge. The research design was pre-experimental pretest posttest design with sequential explanatory mix-method. Respondents in this study were 2020 class students at the Faculty of Medicine, University of Riau, totaling 87 people using a random sampling technique. Based on the level of user satisfaction with the developed LMS, no users stated that they were very dissatisfied or dissatisfied, while 4 (5%) users stated that they were quite satisfied, 27 (31%) were satisfied, and 56 (64%) were very satisfied. The average pretest score was 41, and the average post-test score was 50. The test results of the difference between pretest and post-test values using the Wilcoxon test showed a difference with a sig (2-tailed) of 0.005 ($p \leq 0.05$). The advantages of LMS are obtained from the aspects of content, accuracy, format, easy of use, and timeliness. Meanwhile, deficiencies found in the timing that the user feels were inconsistent with the amount of material presented. The developed learning management system has been successful and can improve students' understanding.

ARTICLE HISTORY

Published June 2nd 2023



KEYWORDS

Herbal medicine; increase in knowledge; LMS; user satisfaction.

ARTICLE LICENCE

© 2023 Universitas Hasanuddin
Under the license CC BY-SA
4.0



1. Introduction

A learning management system (LMS) is a platform that helps deliver content online for learning purposes (Nguyen, 2021; Zanjani, 2017). This system is designed to deliver courses, acquire knowledge, and control learning (Arshad et al., 2020; Bradley, 2021; Rahman, 2018). In the era of technological development, LMS makes it easier for students and lecturers in the learning process because it is flexible and supports freedom of access with various communication tools (Kasim & Khalid, 2016; Merza & Ally, 2016; Sukmawaty et al., 2022). Currently, the application of LMS in education is important to use for improving education.

Learning management systems provide benefits for academics and students' independent learning abilities. Previous research has suggested that LMS positively affects student interaction, motivation, skills, performance, and achievement (Hidayatullah et al., 2020; Zakiah et al., 2022). In addition, LMS also has a positive effect on academic performance and makes students active in the learning process (Miles et al., 2014; Welz et al., 2018; Rahman & Amir, 2019).

As an information system in learning, it is necessary to evaluate the LMS. Although LMS has advantages, LMS also has disadvantages. Unattractive features, confusing instructions, as well as the large cost can also be found as shortcomings of the LMS (Ha & Nguyen, 2019; Hettiarachchi et al., 2021; Hasnia et al., 2022). All these issues indirectly affect users' thinking about LMS.

LMS effectiveness testing was conducted using the Delone & Mclean information system success model of 1992. This model measures six success factors of an information system (Aldholay et al., 2018; Kim et al., 2019; Rahman et al., 2019). User satisfaction is the most widely used measure to assess the success of information because of the high level of validity, a large number of studies allow the development of instruments that it is reliable, and the appeal of

satisfaction as a measure of success is quite strong (Dreheeb et al., 2016; Anggawirya et al., 2021). Data on this factor have been used to determine the usefulness, productivity, and superiority of an information system (Aldholay et al., 2018; Kim et al., 2019).

The study of herbal medicine at FK UNRI is in the elective block so that some students can only follow it. In fact, the use of herbs among the public has been widespread (McKnight et al., 2017). According to WHO, 65% are in developed countries and 80% in developing countries. However, there is still a lack of knowledge about herbal medicine among doctors (Kumala, 2015). This will risk drug interactions (Carrasco-Hernández & Jiménez-Jiménez, 2016).

2. Methodology

This study used a pre-experimental research design one group pretest posttest design with a mix method sequential explanatory. The study was conducted from August 2022 to February 2023 at the Faculty of Medicine, University of Riau. The big variable in this study is the use of learning management systems developed on the topic of herbal medicine. The dependent variables are the level of user satisfaction and the results of the pre-test post-test in the learning management system developed. The population of this study is FK UNRI students class of 2020 totaling 127 people. The sampling technique of this study uses simple random sampling, based on the formula of Isaac & Michael a minimum sample of 87 samples. This research has been declared to have passed the ethical review by UEPPK FK UNRI and already has a letter number: B/207/UN19.5.1.1.8/UEPPK/2022.

The inclusion criteria for this study are students willing to follow the herbal medicine learning process using LMS from start to finish. While the exclusion criteria for this study are students who have attended herbal medicine learning, and do not fill out the pre-test and post-test. All research subjects are willing to participate in the research after being given information about the purpose of this study and have signed an informed consent sheet.

The satisfaction measurement instrument uses the End User Computing Satisfaction (EUCS) questionnaire developed by Doll & Torkzadeh in 1988. The EUCS questionnaire consists of aspects of content, accuracy, format, easy of use, and timeliness. In this study, the EUCS instrument has been valid and reliable. The measurement instrument for increasing knowledge uses two question packages consisting of pre-test and post-test. Pre-test and post-test questions are carried out construct validation by pharmacology experts, and continued content validation by medical education lecturers. Both question packs are valid and reliable. The qualitative satisfaction measurement instrument uses a semi-structured interview question list developed from the results of quantitative data analysis. The learning management system used in this study can be seen in Figure 1.



Figure 1. Learning Management System Developed on the Topic of Herbal Medicine

Learning management system is developed using moodle 4.0. In LMS, there is an overview of the herbal medicine module which contains the objectives and duration of learning. The subject matter of herbal medicine consists of the basic concepts of herbs, herbal medicinal preparations, safety, and efficacy of herbal medicines, herbal phytochemistry, scientific test stages of herbal medicine / herbal medicine, and herbal applications in herbal and OHT products. Media LMS has been due diligence through validity. The division of herbal medicine topics can be seen in Figure 2.

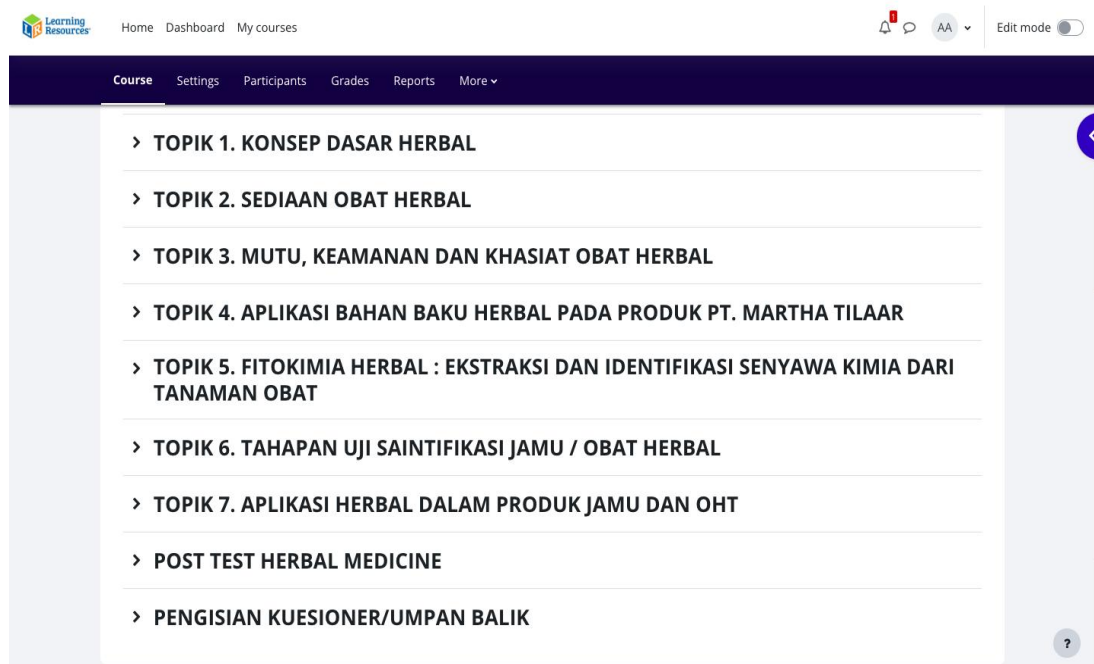


Figure 2. List of Herbal Medicine Self-Study Topics

Analysis of satisfaction level measurement data as follows:

- Answer Score : The sum of each variable
- Total Score : $Penilaian(SS*5)+(S*4)+(S*3)+ (TS*2)+(STS*1)$
- Average : Total score divided by the number of respondents
- Interpretation : Taken on average and then interpreted based on Table 1.

Table 1. Likert Scale Assessment Interval by Kaplan & Norton Theory (2000)

Interval	Information
4,2-5	Very Satisfied (SP)
3,4-4,19	Satisfied (P)
2,6-3,39	Simply Satisfied (CP)
1,8-2,59	Dissatisfied (TP)
1-1,79	Very Dissatisfied (STP)

Analysis of measurement of increased knowledge before and after using LMS developed on the topic of herbal medicine using the Paired Sample T-Test/Wilcoxon Test. A variable is said to change if its significance value is small from atau equal to 0.05. Qualitatively, data analysis using the model of Miles et al., (2014), consists of the stages of data collection, data condensation, data presentation, and conclusions (Nugroho & Arifudin, 2014).

3. Result and Discussion

The results of measuring the level of satisfaction of learning management system users were obtained on average of 4.51 with the interpretation of the level of satisfaction, namely "Very Satisfied". The presentation of each level of satisfaction is shown in Table 2.

Table 2. Results of Measurement of Herbal Medicine LMS User Satisfaction Level

No	Satisfaction Level	N	%
----	--------------------	---	---

1	Very satisfied	56	64
2	Satisfied	27	31
3	Quite Satisfied	4	5
4	Not Satisfied	0	0
5	Very dissatisfied	0	0

Based on the table above, no user expressed very dissatisfied and dissatisfied. While users who expressed quite satisfied by 4 (5%), satisfied 27 (31%), and very satisfied 56 (64%) with the use of LMS developed on the topic of herbal medicine in FK UNRI.

The results of measuring the user's level of knowledge from the difference in pre-test post-test LMS can be seen in Table 3.

Table 3. Data on Differences in Pre-test and Post-test Results in Herbal Medicine Learning Using LMS

	N	Min	Max	Mean	Std.D	P value
Pre-test	87	13	87	41	14,09	0,005
Post-test	87	12	100	50	23,66	

The table above shows that of the 87 respondents, the average pretest score was 41 and the post-test was 50. The pre-test standard deviation was 14.09 and the post-test was 23.66. The minimum pre-test score is 13 and the post-test is 12. Meanwhile, the maximum pre-test value is 87 and the post-test is 100. Then, testing the normality of the data using Kolmogorov-Smirnov ($n > 50$) found that the data was not normally distributed. So that the alternative analysis of two data using the Wilcoxon test.

The test results of the difference between pretest and post-test values using the Wilcoxon test showed a difference with a sig (2-tailed) of 0.005 ($p \leq 0.05$). This indicates an increase

Significant knowledge between before and after using LMS developed on the topic of herbal medicine.

Qualitatively, the advantage of LMS developed from the aspect of content is to provide new knowledge for users, in accordance with user expectations and needs. User ratings as follows :

... that this is new learning material to me,... (R4.3)

... Yes, it is useful because everything conveyed is new knowledge too (R1.2)

... If the content might be appropriate, yes because it is divided into several topics... (R1.1)

... For example, phytopharmaceutical learning is what is developing, so it suits my needs. (R3.2)

The advantage of the accuracy aspect is that the system displays accurate information information, according to the topic discussed, and there are rarely errors or errors when used. User ratings as follows :

... In my opinion, it is accurate that the video with topics is topic one about the basic concepts of herbal medicine, well the video is also about the basic concepts of herbal medicine, sis. (R2.1)

... You could say 90% is accurate..., And when submitted, the answer has been immediately discussed, sis. (R4.1)

... If there is no error, sis,... (R2.2)

... Immediately save my user and password kak so just log in. (R2.3)

The advantages of the format aspect are attractive, increase motivation, comfortable to look at, clear and easy to understand. User ratings as follows :

... If the design is interesting, brother, because there is a display of our progress to what extent, brother,.. (R3.1)

... In my opinion, the website's appearance is good, sis. Because in general, the appearance of white color becomes more neutral in the eye, and there is no striking color / dark color, sis. (R5.1)

... The menu structure is also easy to understand, sis. (R2.3)

... and does not tire the eyes. (R3.2)

... I personally am comfortable accessing it, and it's not complicated, sis, just click and obviously sis. (R4.1)

The advantages of the easy of use aspect are flexible, easy to understand, easy to obtain, provide clear guidance, and easy to use. The assessment of the user as follows :

... In my opinion, the website is easy to understand, brother, and easy to get too(R2.1)

...But over time it is easy to understand and easy to operate. (R3.1)

...Its use is quite flexible, sis. (R4.2)

...In my opinion, it's easy to use, sis. (R1.1)

...Previously, there was also a guide to use it, sis, so for new users like me, it is very helpful to access it, sis. (R2.2)

The advantage of the timeliness aspect is that it displays information with time and presents up-to-date information. User ratings as follows:

I think it's fast, sis, on time too. (R1.1)

The website always displays information in a timely manner sis (R3.1)

Yes, sis, always on time, sis,... (R5.1)

In my opinion, up-to-date is seen from the date as well and the materials presented. (R1.2)

In my opinion, sis, the information is uptodate, sis.... (R2.2)

Uptodate sis, because from his journals the latest 10 years kak (R9.2)

Meanwhile, the shortcomings found n in the material provided are quite a lot. User ratings as follows :

... We only have to provide quite a lot of free time because the material is also a lot of sis. (R7.1)

The results of the analysis of the level of user satisfaction with LMS developed on the topic of herbal medicine based on EUCS showed the category "Very Satisfied". This shows that the LMS developed successfully. One of the factors that measure the success of LMS is user satisfaction (Shah et al., 2018). User satisfaction is a form of response that arises from the user after finishing using the information system (Von Stumm et al., 2011).

A learning media that can provide satisfaction to users will cause learning motivation. The more satisfied a user is, the higher the motivation to learn (Susilowati, 2020; Von Stumm et al., 2011). Learning motivation is influenced by the usefulness and pleasure of something being learned. The usefulness of the learned sapis an external motivation, namely with knowledge helps complete the work. While pleasure comes from internal motivation which refers to feelings of pleasure and satisfaction with a learning (Kung et al., 2012). The higher the user's ability, the better the success rate of the LMS as a learning medium (Satyawati, 2020).

LMS user satisfaction depends on the quality of the LMS presented. These qualities are the quality of the systems used and the quality of the information presented (Ahmad et al., 2019). The better the quality of the learning system, the higher the level of user satisfaction. System quality is ease of use, which states that users do not need much peace and time to use the system (Zakiah et al., 2022).

The better the quality of information, the higher the level of user satisfaction. An information system that can produce information in a timely, accurate, as needed, and relevant manner provides satisfaction to users. Satisfied users perform better than dissatisfied ones (Aldholay et al., 2018).

The results of measuring pre-test and post-test scores obtained before and after the use of LMS on herbal medicine topics show that LMS can increase user knowledge in independent learning. Learning management systems can increase user understanding because they are practical, increase motivation, and provide freedom for user learning (Kumala, 2015).

The use of LMS is practical so that it can increase user knowledge. Users can adjust free time when using the LMS. With no limited time and place, users become more free to access material and independently. This factor makes the interest and completeness of users higher in learning (Dreheeb et al., 2016). Users agree with the existence of LMS learning to be flexible. Flexibility has a significant relationship to increased knowledge (Nugroho & Arifudin, 2014).

Learning management systems can increase motivation, which directly increases learning outcomes. Features contained in the LMS are able to provide feedback directly from user answers. It can be used as an evaluation material to determine the strengths and weaknesses of users in a particular topic based on test results. So, users will be motivated to repeat the material. This motivation is in line with the success of academic performance.

Teaching materials on LMS contain video, text, images, and audio that can be adjusted to the user's learning style. Thus, LMS can make it easier for users to understand the material (Kung et al., 2012). Users are also more interested in providing material of various types so as to increase interest in learning, increase understanding of material concepts, and improve results learn (Dreheeb et al., 2016).

The advantage of LMS from the aspect of content is that it provides new knowledge, in accordance with user expectations and needs. New knowledge can increase motivation in learning and support academic performance of learning. In addition, information systems relevant to the needs and expectations support user learning so that they can be applied in daily work (Zanjani, 2017).

The advantage of LMS from the aspect of accuracy is that it displays accurate information according to the topic discussed, and rarely errors occur when used. Accuracy is part of the quality of information. Good accuracy will make the quality of the information presented good. One of the successes of an LMS is measured by the quality of information (Hidayatullah et al., 2020). The quality of the information presented is good, will increase user satisfaction.

Other advantages of LMS obtained in terms of appearance are attractive, increased motivation, comfortable to look at, clear, and easy to understand. A good LMS display will attract users' interest. This makes users feel satisfied and confident in using the LMS (Aldholay et al., 2018). Good views have a positive influence on user satisfaction and effectiveness.

Ease of use is an important factor to consider in making LMS as an independent learning medium. The advantages of this aspect are flexible, easy to obtain, provide clear tools, and easy to use. An easy-to-use structure can affect user engagement, the easier a system is, the more satisfied users will be (MERZA & ALLY, 2016).

The advantage of LMS obtained from the aspect of punctuality is that it always displays information on time and presents up-to-date information. Timeliness and up-to-date information is an important aspects of information quality that will impact user satisfaction (Nguyen, 2021). The more punctual, the better the quality of the information. The better the quality of information, the higher the level of satisfaction of a user.

The disadvantage of LMS is that the material provided is quite a lot. This relates to time management skills in the learning process. Time management skills are very important because they will positively impact learning. With these skills, self-directed learning will run successfully, improving user learning outcomes (Bradley, 2021). However, when users are unable to set time as a result of a learning environment that is not conducive, it can affect motivation in learning (Zanjani, 2017).

4. Conclusion

The level of satisfaction of LMS users developed on the topic of herbal medicine gets a satisfaction level category, namely "Very Satisfied". The use of LMS shows a significant increase in knowledge between before and after learning. Qualitatively, the use of LMS has advantages in terms of content, accuracy, format, easy of use, and timeliness. But having to the lack in time settings that users feel has not been in accordance with the amount of material presented. Users are expected to improve their skills in managing study time and for educational institutions to develop LMS in herbal medicine as an independent learning medium.

References

- Ahmad, S., Batool, A., & Ch, A. H. (2019). Path relationship of time management and academic achievement of students in distance learning institutions. *Pakistan Journal of Distance and Online Learning*, 5(2),191-208.
- Aldholay, A. H., Isaac, O., Abdullah, Z., & Ramayah, T. (2018). The role of transformational leadership as a mediating variable in DeLone and McLean information system success model: The context of online learning usage in

- Yemen. *Telematics and Informatics*, 35(5), 1421–1437.
- Anggawirya, A. M., Prihandoko, L. A., & Rahman, F. (2021, December). Teacher's Role on Teaching English during Pandemic in a Blended Classroom. In *International Joined Conference on Social Science (ICSS 2021)* (pp. 458-463). Atlantis Press.
- Arshad, M., Almufarreh, A., Noaman, K. M. G., & Saeed, M. N. (2020). Academic semester activities by learning management system during COVID-19 pandemic: A case of Jazan University. *International Journal on Emerging Technologies*, 11(5), 213–219.
- Bradley, V. M. (2021). Learning Management System (LMS) use with online instruction. *International Journal of Technology in Education*, 4(1), 68–92.
- Carrasco-Hernández, A. J., & Jiménez-Jiménez, D. (2016). Knowledge management, flexibility and firm performance: The effects of family involvement. *European Journal of Family Business*, 6(2), 108–117.
- Dreheeb, A. E., Basir, N., & Fabil, N. (2016). Impact of system quality on users' satisfaction in continuation of the use of e-learning system. *International Journal of E-Education, e-Business, e-Management and e-Learning*, 6(1), 13-20
- Ha, N., & Nguyen, T. (2019). The effect of trust on consumers' online purchase intention: An integration of TAM and TPB. *Management Science Letters*, 9(9), 1451–1460.
- Hasnia, H., Andini, C., Tahir, M. D., Hunaeni, H., Zulfikariandi, Z., & Muslimin, M. T. (2022). The Ability of 1st Class Students of SMAN 11 Enrekang to Arrange Verbal and Nominal Sentences. *ELS Journal on Interdisciplinary Studies in Humanities*, 5(3), 539-550.
- Hettiarachchi, S., Damayanthi, B. W. R., Heenkenda, S., Dissanayake, D., Ranagalage, M., & Ananda, L. (2021). Student satisfaction with online learning during the COVID-19 pandemic: a study at state universities in Sri Lanka. *Sustainability*, 13(21),1-24.
- Hidayatullah, S., Khourouh, U., Windhyastiti, I., Patalo, R. G., & Waris, A. (2020). Implementasi Model Kesuksesan Sistem Informasi DeLone And McLean Terhadap Sistem Pembelajaran Berbasis Aplikasi Zoom Di Saat Pandemi Covid-19. *Jurnal Teknologi Dan Manajemen Informatika*, 6(1), 44–52.
- Kasim, N. N. M., & Khalid, F. (2016). Choosing the right learning management system (LMS) for the higher education institution context: A systematic review. *International Journal of Emerging Technologies in Learning*, 11(6),55-61.
- Kim, E.-J., Park, S., & Kang, H.-S. (2019). Support, training readiness and learning motivation in determining intention to transfer. *European Journal of Training and Development*, 43(3/4), 306–321.
- Kumala, R. A. (2015). The impact of information quality and system quality on user satisfaction in web-based information system (Study on the Employees of Bank Rakyat Indonesia Malang). *Brawijaya University*, 2 (2),1-12
- Kung, S. M., Mat Yamin, F., & Wan Ishak, W. H. (2012). Design, Purpose of Usage and the Impact of LMS on Student Learning: A Preliminary Findings. *Knowledge Management International Conference (KMICe)*, 661-664
- McKnight, D. H., Lankton, N. K., Nicolaou, A., & Price, J. (2017). Distinguishing the effects of B2B information quality, system quality, and service outcome quality on trust and distrust. *The Journal of Strategic Information Systems*, 26(2), 118–141.
- Merza,H & Ally,M.(2016). Evaluation Of Learning Management System Contents Of Selected Courses At The Arab Open University. *International Interdisciplinary Journal of Education*, 5(4), 661-664
- Miles, M. B. A., Huberman, M., & Saldana, J. (2014). *Qualitative Data Analysis, A Methods Sourcebook*. Saeg Publication. Inc.
- Nguyen, N.-T. (2021). A study on satisfaction of users towards learning management system at International University–Vietnam National University HCMC. *Asia Pacific Management Review*, 26(4), 186–196.
- Nugroho, Z. A., & Arifudin, R. (2014). Sistem Informasi Tracer Study Alumni Universitas Negeri Semarang Dengan Aplikasi Digital Maps. *Scientific Journal of Informatics*, 1(2), 153–160.
- Rahman, F. (2018). The Constraints of Foreign Learners in Reading English Literary Works: A Case Study at Hasanuddin University. *Journal of Arts and Humanities*, 7(2), 01-12.

- Rahman, F., & Amir, P. (2019). Trends in Reading Literary Fiction in Print and Cyber Media by Undergraduate Students of Hasanuddin University. *International Journal of Education and Practice*, 7(2), 66-77.
- Rahman, F., Abbas, A., Hasyim, M., Rahman, F., Abbas, A., & Hasyim, M. (2019). Facebook Group as Media of Learning Writing in ESP Context: A Case Study at Hasanuddin University. *Asian EFL Journal Research Articles*, 26(6.1), 153-167.
- Satyawati, S. T. (2020). Student Satisfaction Towards the Use of F-Learn Services in Online Learning. *Jurnal Pendidikan Dan Pengajaran*, 53(3), 295–306.
- Shah, P. E., Weeks, H. M., Richards, B., & Kaciroti, N. (2018). Early childhood curiosity and kindergarten reading and math academic achievement. *Pediatric Research*, 84(3), 380–386.
- Sukmawaty, Rahman, F. F., & Andini, C. (2022). Covid-19 Pandemic and Axiology of Communication: A Study of Linguistic Phenomena. *IJISRT*, 7(4), 1079-1087.
- Susilowati, H. (2020). E-learning systems: System Quality, Information Quality and Service Quality on User Satisfaction. *Journal of Business and Management Review*, 1(3), 208–222.
- Von Stumm, S., Hell, B., & Chamorro-Premuzic, T. (2011). The hungry mind: Intellectual curiosity is the third pillar of academic performance. *Perspectives on Psychological Science*, 6(6), 574–588.
- Welz, A. N., Emberger-Klein, A., & Menrad, K. (2018). *BMC Complementary Altern. Med*, 18, 1–9.
- Zakiah, A., Nur Haryanti, A. F., Utami, T., Nurrahman, A., Ritia, R., & Zamolistria, M. R. (2022). Implementation of the Delone & McLean Method to Measure The Success of the Performance Accountability System of Government Agencies (SAKIP) Application In Supporting Good Government, Case Study : Subang District Government. *Central Asia & the Caucasus (14046091)*, 23(1), 4252-4263
- Zanjani, N. (2017). The important elements of LMS design that affect user engagement with e-learning tools within LMSs in the higher education sector. *Australasian Journal of Educational Technology*, 33(1), 19-31