

Which Activity Maintain Engagement in Distance Learning and How It Can Increase Student Achievement? Lesson Learned from Herbal Medicine Module in Indonesia

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The aim of this study is to investigate the activity which maintain the engagement of students and improve student's learning achievement in the herbal medicine module during a distance learning course that was conducted by the faculty of

medicine Universitas Indonesia through Student Centered e-Learning Environment (SCeLE). The data collected from log data of 340 students in SCeLE, which consist of the frequency of students accessing the course including access resources and participate in asynchronous online discussion. Bivariate correlation and linear regression analysis were analyzed. The frequency of access to students to learning materials, forum discussion, and the course is a statistically significant impact on student learning outcomes. The coefficient correlation of frequency of student participation in forum discussion, access learning material, access to course to student's final grade are 0.665, 0.709, and 0.755, respectively. The topic which is frequently accessed by students has a higher average score in the final exam. The frequency of participation in forum discussion has a greater influence on student's final grade than the frequency of student accessing learning materials to the final grade in the implementation of distance learning.

Keywords: Medical Education, Open and Distance Learning, e-Learning, Teaching and Learning, Learning Outcome, Student Engagement

INTRODUCTION

The development of technology has a big impact in transform education in many ways. It has changed the way of teaching-learning, especially the relationship between students and teachers. Technology has recently made access to higher education more readily available. Learning today is not limited by space and time anymore. As the world largest archipelago country with more than 17,000 islands and the most diverse country with many remote areas, Indonesia faces many unique challenges in education that require a specific solution. In 2018, the Gross Enrolment Ratio (GER) or Gross Enrolment Index (GEI) of higher education in Indonesia is still low.

Around 65.42% of Indonesian children are unable to continue their education into higher education because of geographical, economic, and time constraints (Nirmala et al., 2018). Moreover, uneven distribution and inequality of quality education across the archipelago are other challenges to Indonesian education. Particularly inequality of quality of teachers in Indonesia is also different between in rural and urban areas (Febriana et al., 2018), (Luschei & Zubaidah, 2012). To overcome this challenge, distance

learning have become a program of the Ministry of Education and Culture of the Republic of Indonesia to improve quality education in Indonesia by opening opportunities to universities both public and private, to open this program with specific rules (Syae Purrohman, 2014).

Purpose Statement

The purpose of this study is to investigate the activities which maintain the engagement of students and improve student's learning achievement in the herbal medicine module during a distance learning course. This herbal medicine course was conducted by the faculty of medicine Universitas Indonesia through Student Centered e-Learning Environment (SCeLE).

Problem Statement

Many children in Indonesia cannot advance to higher education because of geographic, social, and time constraints. Therefore, it was necessary to create an online course on herbal medicine conducted by the faculty of medicine and to have more online distance learning courses for students in rural areas.

There were just a few universities that already offered courses by distance learning in Indonesia, especially in a health-related area. To support the government program, the Medical Pharmacy Department, Faculty of Medicine, Universitas Indonesia has offered a distance learning course. This course is called the herbal medicine module that was carried out entirely online through SCeLE (Student Centered e-Learning Environment). SCeLE is a Moodle-based LMS (Learning Management System) that was developed by the Center for Learning Resources Universitas Indonesia (KSDP UI).

This module was chosen because learning about herbal medicine is considered important and Indonesia is a country rich in natural resources and our ancestors have used Indonesian plants as a treatment for years. Due to, this module was not available in several universities such as the University of Palangka Raya and Tasikmalaya Health Polytechnic of Ministry of Health, so that many students from both universities were interested to take this course and earn credit points that were offered by the Faculty of Medicine, Universitas Indonesia.

Hypothesis

The frequency of participation in forum discussion and accessing materials might has an impact on student's final grade in the implementation of

distance learning. The more the students participate, the higher their grades in this module.

Literature Review

Many researchers reported that the use of technology can support student engagement in an online environment (Kahn et al., 2017). The use of technology like SCeLE may lead to structurally change the learning environment within which student engagement with their studies. Student engagement is one of the very important factors in teaching and learning activities. It can help to improve the quality of learning outcomes. There are many definitions of student engagement, but to make it easy to measure Axelson RD, Flick A (2010) has defined this term in narrower definition as the level of student's involvement or participation in the learning process (Axelson & Flick, 2010).

Numerous studies have shown that in general distance learning is at least as effective as conventional face-to-face learning (Nguyen, 2015). There is a positive correlation between the utilization of technology, student engagement, and learning outcomes (Kahn et al., 2017). However, it remains unclear and lacks empirical research about how the correlation of the student's participation pattern and learner performance. The successful implementation of distance learning can also be measured by the high level of participation. In an online learning environment, there are many techniques available to gather information related to student participation in the course, such as review log in data, online duration, view of learning modules or course content, online discussion, and other formative tools (Gray, 2015). This technique will provide useful information for teachers to understand the impact of student's participation on student's learning achievement. While student performance can be determined by several factors such as student completion, course withdrawals, grades, knowledge and skill gain (Davies & Graff, 2005).

Based on the background above, the aim of this study has proposed an activity that maintains the engagement of students and improve students' learning achievement in the herbal medicine module during a distance learning course that was conducted by the Medical Pharmacy Department Faculty of Medicine, Universitas Indonesia through SCeLE. There is limited evidence of student engagement analysis especially in medical and health related student in understanding herbal medicine.

METHODS

The study was quantitative and used secondary data from University Learning Management System (SCeLE) in Herbal Medicine Module.

Participants

There were 340 students who participated in this study. The participants were students from the University of Palangka Raya (63 students) and Tasikmalaya Health Polytechnic of Ministry of Health (277 students). Those were students with medical education background such as medicine, mid-wifery, nursing, and nutritional science.

Design and Setting

Herbal medicine module was offered by distance learning. Teaching and learning activities were undertaken entirely online by accessing the module provided at Student Centered e-Learning Environment (SCeLE). The module was carried out within 6 weeks, there is one topic per week. Every week during the course (each topic), students were given some learning materials. Furthermore, students were asked to do the tasks and participate in an asynchronous online discussion, and then at the end of the topic, there is a quiz to assess their understanding of the topic.

The scope of learning content in the herbal medicine module includes insights about Indonesian plants that can be used appropriately and rationally in daily treatment, as well as knowing important issues regarding herbal medicine. This content was offered in asynchronous e-learning materials such as practice video, lecture video, PowerPoint Audio (ppt recording), PDF learning material, and PDF journal. The interactive e-learning segments covered assignments with case scenarios and questions, pre-test, and post-test, as well as problem-based learning (PBL) through an online discussion forum. The assessment and evaluation method used in this module consist of assignment, quiz including a pre-test and post-test, and summative test.

Data Collection

This study used secondary data that was collected from log activities of students each week during the course in SCeLE to analyse the participation pattern of the students. The data consist of the frequency of student accessing online course viewing learning resources and adding or updating forum discussion) and participation of the student in quiz or task or assignment. The data of student's final grade was gathered from assignment and quiz including pre-test and post-test (40%) and summative exam (60%).

Data Analysis

This study employed a quantitative research method to investigate relations and study the cause-effect phenomena. The data was analysed using a statistical analysis program, IBM SPSS Statistics 25 for windows. Analysis of the student engagement was framed by adapting two criteria to measure e-learning impact.

- Access – analysis online visit (access to course) and participation (access to learning materials and forum discussion).
- Quality – analysis of student learning outcome (grade) Bivariate correlation and linear regression were used to study the correlation between two variables and to discover the significance among the participation and grades of the students during their interaction in online and distance learning course.

RESULTS

Prior to the analysis data (N = 340), the cleaning process was conducted to improve the accuracy. One missing data was deleted resulting in the final data N = 339. The characteristics of the student based on their gender and educational background consist of pharmacy, midwifery, nursing, medicine, and nutrition can be seen in Table 1.

Table 1
Characteristics of Students by Gender and Department

Items	N	%
1. Gender		
- Male	52	15.3
- Female	287	84.7
2. Department		
- Pharmacy	13	3.8
- Midwifery	145	42.8
- Nursing	103	30.4
- Medicine	62	18.3
- Nutrition Science	16	4.7

The frequency of students accesses to the activities available in the course has a significant impact on student learning outcome. The result in Table 2, shows the highest mean and median score of frequency access were obtained by the nursing and medicine department and then their final grade also shows that both departments attained the highest score. It indicates that the frequency of access students to learning materials, forum discussion, and the course is proportional to student learning outcomes. The students from the pharmacy, midwifery, and medicine department have the lowest frequency of access and score in their final grade. The interesting thing is the result from the medicine department even though the number of students who participated in this course was low but the average score of students in their final grade is the highest, among others. Meanwhile, students from midwifery are the most participants but the frequency of access to the activities and their final grade is low. Although most students who participated in the herbal module had similar motivation, except the medical student who has the obligation to earn credit point. The result shows that the obligation of students to take part in the module turned out to have a considerable influence on student's learning outcome. Meanwhile, from the result of the review of the student's post in the discussion forum during the introduction session (pre-course), it is known that most of them were taking this module because they wanted to gain more knowledge about herbal medicine and its applications.

Table 2
Descriptive statistics of student engagement's variables

Items	Descriptive		
	Mean	Median	IQR*
1. Frequency of Access Learning Material	18.37	14.00	32.00
- Pharmacy	7.62	0.00	19.00
- Midwifery	11.59	3.00	18.00
- Nursing	27.15	29.00	36.00
- Medicine	24.03	23.00	19.50
- Nutrition Science	10.19	3.50	24.75
2. Frequency of Participate in Forum Discussion	2.33	2.00	4.00
- Pharmacy	1.20	0.00	2.00
- Midwifery	3.56	4.00	4.00
- Nursing	3.82	4.00	2.00
- Medicine	0.75	0.00	1.00
- Nutrition Science			
3. Frequency of Access Course	116.42	65.00	195.00
- Pharmacy	22.38	6.00	24.00
- Midwifery	61.44	21.00	59.50
- Nursing	176.49	195.00	187.00
- Medicine	182.63	175.50	96.50
- Nutrition Science	47.88	18.50	83.00
4. Final Grade	38.59	33.60	38.22
- Pharmacy	24.09	37.96	39.60
- Midwifery	27.09	26.40	10.80
- Nursing	43.15	56.53	57.38
- Medicine	63.48	70.96	29.66
- Nutrition Science	28.91	31.40	17.89

*IQR: Interquartile range

Table 3 shows the relation between the frequency of access student to a topic and their average score of final exams. The frequency of student access to a topic is proportional to the average score in the final exam. The topic which is frequently accessed by students has a higher average score in the final exam. The most frequently accessed topics in this course are topic 4 and 2. Topic 4 is about “Herb Dosage Form” and topic 2 is “Phytochemical of Herbs: Extraction and Identification of Chemical Compounds from Medicinal Plants”. There is a possibility that students are motivated by these two topics so that the participation pattern in these two topics has increased. The average score of topic 4 and 2 are 46.12 ± 25.91 and 40.01 ± 25.08 , respectively. The overall mean final exam score is 42.24 ± 22.34 .

Meanwhile, students obtained the highest score on topic 1 even though the number of participants’ access to topic 1 is lower than others topic. It indicates that other factors that influence it besides the frequency of students’ access to each topic. The level of difficulty of this topic is lower than others topic and related to student’s previous knowledge. So that, students are easier to understand and attain a higher score on this topic.

Table 3
The comparison of frequency access of students and average score in final exam for each topic

Topic	Title	Delivery Method (Number of Activities)	Frequency of Access*			Average Score in Final Exam** (Mean \pm SD)
			Mean	Median	IQR	
Pre	Introduction	Forum Discussion (1) Guideline Book Pdf (1) Pre-test (1) Assignment (1)	29.79	27.00	23.00	-
1	Basic Concept of Herbs	Lecture video (2) PowerPoint Audio (1) Forum Discussion (1) Assignment (1)	12.28	5.00	19.00	48.38 ± 26.75
2	Phytochemical of Herbs: Extraction and Identification of Chemical Compounds from Medicinal Plants	PowerPoint Audio (2) PDF Journal (2) Forum Discussion (1) Practice Video (2) PDF Learning Material (1) Quiz (1)	28.44	24.00	44.00	40.01 ± 25.08
3	Scientification of Jamu	PowerPoint Audio (3) PDF Learning Material (1) Practice Video (1) Forum Discussion (1) Assignment (1) Quiz (1)	14.42	7.00	24.00	37.79 ± 26.02

Topic	Title	Delivery Method (Number of Activities)	Frequency of Access*			Average Score in Final Exam** (Mean ± SD)
			Mean	Median	IQR	
4	Herb Dosage Form	PDF Learning Material (3) Forum Discussion (1) Assignment (1) Quiz (1)	33.42	4.00	64.00	46.12 ± 25.91
5	Efficacy, Safety, and Quality of Jamu	PDF Learning Material (1) PowerPoint Audio (1) PDF Journal (9) Forum Discussion (1) Assignment (1) Quiz (1)	19.82	.00	35.00	39.76 ± 23.83
6	Application of Jamu on Health Clinic	PowerPoint Audio (2) PDF Learning Material (4) Assignment (4) Feature Chat (2) (unrecorded)	8.05	.00	8.00	-

*Based on number of access to topic per student.

**Based on related question to each topic.

Due to the student's final grade is not distributed normally, a bivariate correlation (spearman's rho correlation) was conducted. The result shows that the frequency of access to learning material, frequency of participation in forum discussion, and frequency of access course was significantly and positively correlated with student's final grade. As can be seen in **Table 4**, the coefficient correlation of frequency of student participation in forum discussion to student's grade is slightly greater than the frequency of student in accessing learning material to student's final grade. The coefficient correlation of frequency of student participation in forum discussion and frequency of student in accessing learning material to student's final grade were 0.665 and 0.709, respectively. It indicates that the frequency of student participation in forum discussion has a greater impact than the frequency of student accessing learning material to student's final grade.

Table 4
Spearman's rho correlation between student engagement variables and final grade

		1	2	3	4
1.	Frequency of Access Learning Material	1.000	0.727**	0.917**	0.665**
2.	Frequency of Participate in Forum Discussion		1.000	0.844**	0.709**
3.	Frequency of Access Course			1.000	0.755**
4.	Final Grade				1.000

** . Correlation is significant at the 0.01 level (2-tailed).

The scatter plot was used to describe the relationship between the observed variables, frequency of access learning material to final grade and frequency of participation in forum discussion to the final grade. There is a positive correlation between the two variables. The frequency of participating in forum discussion has a stronger impact than the frequency of access to learning material to student's final grade. It can be seen from the R^2 linear value of frequency of participation in forum discussion to final grade in Figure 1. It describes that student was able to gain greater score if they increased the frequency of access to learning material and/or participate in forum discussion.

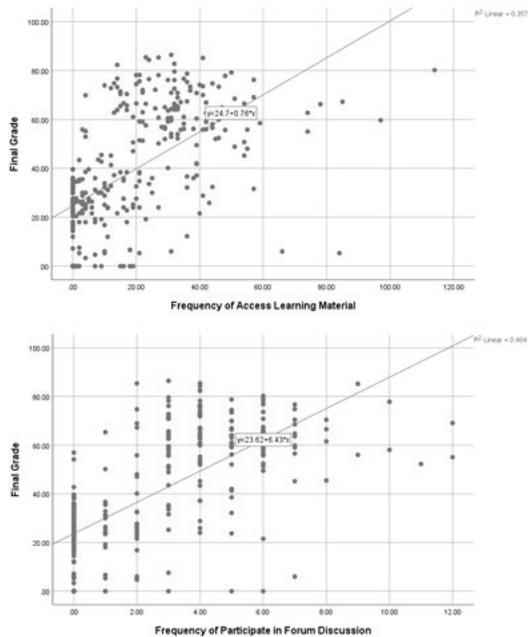


Figure 1. Scatter plots of two predictor variables plotted against student's final grade.

To ensure the impact of frequency of student in accessing learning material and frequency of students in participating in forum discussion as the independent variables of student's final grade predictor, the collinearity analysis was also conducted. **Table 5** shows that there is no multicollinearity problem with both independent variables (Frequency of access learning material, Tolerance = 0.578, VIF = 1.729 and Frequency of participating in forum discussion, Tolerance = 0.578, VIF = 1.729). Therefore, the assump-

tion of frequency of student in accessing learning material and frequency of students in participating in forum discussion as student's grade predictor is true.

The frequency of participation in forum discussion has greater impact on student's final grade in the implementation of distance learning. It was emphasized by the standardized coefficients beta of frequency of student's participation in a forum discussion that is about twofold higher than the frequency of student accessing learning material.

Table 5
Regression analysis of frequency of access material
and participation in forum discussion

Model	B	SE _B	β	t	Sig.
Frequency of Access Learning Material	0.340	0.064	0.269	5.324	<0.001
Frequency of Participate in Forum Discussion	4.782	0.476	0.507	10.045	<0.001

Dependent Variable: Grade ($R^2 = 0.506$, adjusted $R^2 = 0.503$)

DISCUSSION

Even though distance learning has been widely adopted in many countries, the low level of completion rate and student's retention are still become the most common problem found in distance learning practice (Sánchez-Elvira Paniagua & Simpson, 2018), (Shikulo & Lekhetho, 2020). According to previous studies, the low level of completion rate and retention of participants in distance learning was influenced by the low involvement of the student in learning activities. Whereas student's engagement plays an important role to prevent student drop-out and increase retention of student and student's final grade (Bolliger & Halupa, 2018).

This study will emphasize student engagement in terms of student participation in the course and its effect on student final grades. The frequency of student accessing the course including the frequency of student participates in asynchronous online forum discussion and access to learning material as predictors of student's learning outcome in distance learning. The result reveals that students who were more actively participate in the course attained higher final grade. Increased active student participation may improve student's learning and performance. It supported by Starmer et. al. (2015) that states learning is an active process that involves read, write, discuss, create, or engage in solving the problem (Starmer et al., 2015). It is in line with Levy's finding that students who spent a longer time and in-

vested effort on the course tend to be more motivated to complete the course (Bawa, 2016).

In this study, we found that students who have the obligation to enrol in the course to earn credit points obtained higher score in their final grade. We identified that they were more eager and willing to learn by participating in the course than others. It indicates that external motivation factors such as the obligation to earn credit points motivated students to learn more eagerly and enthusiastically. The influence of motivational factor can also be seen from the fluctuation of student participation on each topic. Kim and Frick (2011) reported that there is learner motivational change during self-directed e-learning, changing in motivation can occur during a course after completing several lessons (K.-J. Kim & Frick, 2011).

Numerous studies have reported a positive correlation between student motivation level and academic achievement (K.-J. Kim & Frick, 2011). Motivated learner prefers to do activities that are challenging, to be actively engaged, to enjoy, and adopt a deep approach to learning, and to show enhanced performance, persistence, and creativity (Hartnett et al., 2011). Moreover, according to Xie et. al.'s study (2006), the student's intrinsic motivation correlates with student's participation (Xie et al., 2011). From this study, we also identified that the changing number of the participation for each topic was influenced by several factors, such as the complexity of the content, different delivering methods used by the instructor, and instructor-students interaction during discussion.

In this study, we also want to focus on evaluating the form of student's participation that influence student's engagement in the course. We analysed two main predictors of student's achievement which is their final grade and the frequency of access to learning material and frequency of participation in online discussion. The activity 'accessing learning material' is not considered as a student's active participation, but it can be used as a predictor of learning achievement. Although students are just viewing resources or learning materials during an online course, it does not mean that students are not learning (Shukor et al., 2015). By analysing students log data, it shows that students have spent a significant amount of time viewing resources or learning materials. It can be considered that students have tried to read the learning materials. Thus, the 'access learning material' activity can be considered as a parameter to analyse student's participation level and it has a contribution to enhancing student's learning outcome. More active students who participated in the course tend to get higher grade. Students' participation in online learning is expressed in various forms. It could be accessed resources or learning materials, interaction in an online discussion, and/or upload an assignment.

Another parameter in this study is considered as student participation is the activity of students in asynchronous online discussion. The finding indicates that during the implementation of online and distance learning, asynchronous online forum discussion has a greater impact on student's performance than access learning material. Therefore, online forum discussion activities in the implementation of distance learning need to be strengthened. The online discussion format used in this study is problem-based learning where students are given a trigger and supervised by teachers during online discussion.

The role of the teacher in online discussion is very crucial to increase student's participation. The teacher takes on the role of coach or facilitator in an online environment. Research suggested that asynchronous online discussion have many positive impacts on distance learning, it enables convenient interaction between students and instructors. Xie et. al. (2011) study reported that course grade has impacted student extrinsic motivation and associated with online discussion activities (Xie et al., 2011).

According to numerous studies, online discussion with large participants can be difficult to do and manage (McCarthy et al., 2010; J. Kim, 2013; Woods & Bliss, 2016). It had a negative correlation with student's participation. Students perceived that online discussion with too many participants is overwhelming and difficult to conduct a meaningful conversation with their peers (Woods & Bliss, 2016). So that, instructors have a critical role in discussion activities in distance learning. Moreover, Xie et. al. (2006) reported that instructor's participation, guidance, and feedback were critical to student's motivation to participate in the online discussion (Xie et al., 2006). Effective questions also have an important role to create effective discussion. The form of questions that can be used in online forum discussion consists of the low and high level of questions that test the level of understanding of student based on Bloom's taxonomy. The analysis, synthesis, and evaluation questions are known to have an effective role in triggering more depth discussion. In Bloom's taxonomy, it can be used to evaluate higher cognitive skill (Wang, 2019).

In this study, we found that the topics used the questions that triggered personal exploration make students were more engaged and interest to share their ideas based on their connection with the topic. This is in accordance with the study conducted by Kim K-J and Frick TW (2011), students will be more motivated and satisfied when they perceive the relevance of the content with their life and the learning experience that is right for them. This kind of questions and the presence of the instructor in leading the discussion and giving some feedbacks proven has increased the frequency of students

participate in asynchronous online forum discussion. It provided additional evidence which supports previous studies that asynchronous online discussion with teacher's involvement will lead to active student's participation and increasing students motivation and satisfaction enables their participation in distance learning (Ozkara & Cakir, 2018).

Besides motivational, course design, and instructor presence, students support team has a significant impact on student's participation in distance learning. It can be seen from the role of the student support team during the implementation of the herbal medicine module, they were always available to help students with difficulty regarding technical issues and keep reminding them to keep progressing in their learning activities. For example, when there were some updates or announcement in the course and student have not accessed them yet, the student support team would remind students through the WhatsApp group. Then after this announcement, the frequency of access to the course has increased. This is supported by several empirical studies reported that support from campus team (student support services) also play an important role to adoption and implementation of online learning (Dhillia, 2017).

CONCLUSION

To conclude, the finding of this study provides an evidence-based strategy to conduct distance learning program. This study, proven that asynchronous online forum discussion has a greater impact on student's achievement than the activity of accessing learning materials. In this study we also suggest the strategy used in conducting successful online and distance learning, faculty or course creator need to pay attention to several aspects in improving student's involvement in distance learning such as the degree of content difficulty, the differences in delivering methods used by the instructor, the instructor-students interaction during the discussion, the role of the instructor leading the discussion, and the role of student support team.

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Statement of Ethics

The ethics committee of the Faculty of Medicine, Universitas Indonesia – Cipto Mangunkusumo Hospital has approved this study, approval number KET-974/UNI2.F1/ETIK/PPM.00.02/2020.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

DGBK designed and led the study, participate in analysis data, and led the manuscript development. AK participated in design the study, led analysis data, and contributed to the manuscript development. PR led the data collection, completed analysis data, and contributed to the manuscript development. WF participated in analysis data and contributed to the manuscript development.

Data Availability Statement

All data generated or analyzed during this study are included in this article.

References

- Axelson, R. D., & Flick, A. (2010). Defining Student Engagement. *Change: The Magazine of Higher Learning*, 43(1), 38–43. <https://doi.org/10.1080/00091383.2011.533096>
- Bawa, P. (2016). Retention in Online Courses: Exploring Issues and Solutions— A Literature Review. *SAGE Open*, 6(1), 2158244015621777. <https://doi.org/10.1177/2158244015621777>

- Bolliger, D. U., & Halupa, C. (2018). Online student perceptions of engagement, transactional distance, and outcomes. *Distance Education, 39*(3), 299–316. <https://doi.org/10.1080/01587919.2018.1476845>
- Davies, J., & Graff, M. (2005). Performance in e-learning: Online participation and student grades. *British Journal of Educational Technology, 36*(4), 657–663. <https://doi.org/10.1111/j.1467-8535.2005.00542.x>
- Dhillia, S. J. (2017). The role of online faculty in supporting successful online learning enterprises: A literature review. *Higher Education Politics & Economics, 3*(1), 136–155. <https://doi.org/10.32674/hepe.v3i1.12>
- Febriana, M., Nurkamto, J., Rochsantiningih, D., & Muhtia, A. (2018). Teaching in Rural Indonesian Schools: Teachers' Challenges. *International Journal of Multicultural and Multireligious Understanding, 5*(5), 11–20. <https://doi.org/10.18415/ijmmu.v5i5.305>
- Gray, J. (2015). *Student satisfaction and perceived learning in online learning*. 31.
- Hartnett, M., George, A. S., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distributed Learning, 12*(6), 20–38. <https://doi.org/10.19173/irrodl.v12i6.1030>
- Kahn, P., Everington, L., Kelm, K., Reid, I., & Watkins, F. (2017). Understanding student engagement in online learning environments: The role of reflexivity. *Educational Technology Research and Development, 65*(1), 203–218. <https://doi.org/10.1007/s11423-016-9484-z>
- Kim, J. (2013). Influence of group size on students' participation in online discussion forums. *Computers & Education, 62*, 123–129. <https://doi.org/10.1016/j.compedu.2012.10.025>
- Kim, K.-J., & Frick, T. W. (2011). *Changes in Student Motivation during Online Learning*. <https://doi.org/10.2190/EC.44.1.a>
- Luschei, T. F., & Zubaidah, I. (2012). Teacher training and transitions in rural Indonesian schools: A case study of Bogor, West Java. *Asia Pacific Journal of Education, 32*(3), 333–350. <https://doi.org/10.1080/02188791.2012.711241>
- McCarthy, J. W., Smith, J. L., & DeLuca, D. (2010). Using online discussion boards with large and small groups to enhance learning of assistive technology. *Journal of Computing in Higher Education, 22*(2), 95–113. <https://doi.org/10.1007/s12528-010-9031-6>
- Nguyen, T. (2015). *The Effectiveness of Online Learning: Beyond No Significant Difference and Future Horizons. 11*(2), 11.
- Nirmala, I., Naser Rafiq Attamimi, A., & Elok Alami, V. (2018). *Statistik Pendidikan Tinggi Tahun 2018* (First). Pusat Data dan Informasi Iptek Dikti, Sekjen, Kemenristekdikti. <https://pddikti.ristekdikti.go.id/asset/data/publikasi/Statistik%20Pendidikan%20Tinggi%20Indonesia%202018.pdf>
- Ozkara, B. O., & Cakir, H. (2018). Participation in online courses from the students' perspective. *Interactive Learning Environments, 26*(7), 924–942. <https://doi.org/10.1080/10494820.2017.1421562>

- Sánchez-Elvira Paniagua, A., & Simpson, O. (2018). Developing Student Support for Open and Distance Learning: The EMPOWER Project. *Journal of Interactive Media in Education*, 2018(1), 9. <https://doi.org/10.5334/jime.470>
- Shikulo, L., & Lekhetho, M. (2020). Exploring student support services of a distance learning centre at a Namibian university. *Cogent Social Sciences*, 6(1), 1737401. <https://doi.org/10.1080/23311886.2020.1737401>
- Shukor, N. A., Tasir, Z., & Van der Meijden, H. (2015). An Examination of Online Learning Effectiveness Using Data Mining. *Procedia - Social and Behavioral Sciences*, 172, 555–562. <https://doi.org/10.1016/j.sbspro.2015.01.402>
- Starmer, D. J., Duquette, S., & Howard, L. (2015). Participation strategies and student performance: An undergraduate health science retrospective study. *Journal of Chiropractic Education*, 29(2), 134–138. <https://doi.org/10.7899/JCE-14-20>
- Syae Purrohman, P. (2014). *Challenges for Higher Education Distance Learning in Indonesia*.
- Wang, Y.-M. (2019). Enhancing the Quality of Online Discussion—Assessment Matters. *Journal of Educational Technology Systems*, 48(1), 112–129. <https://doi.org/10.1177/0047239519861416>
- Woods, K., & Bliss, K. (2016). *Facilitating Successful Online Discussions*. 16, 17.
- Xie, K., Debacker, T. K., & Ferguson, C. (2006). Extending the Traditional Classroom Through Online Discussion: The Role of Student Motivation. *Journal of Educational Computing Research*, 34(1), 67–89. <https://doi.org/10.2190/7BAK-EGAH-3MH1-K7C6>
- Xie, K., Durrington, V., & Yen, L. L. (2011). *Relationship between Students' Motivation and their Participation in Asynchronous Online Discussions*. 7(1), 13.