

PAPER • OPEN ACCESS

Development of e-Learning Courses for Subjects about 'Learn and Learning' with Moodle-based for Prospective Teacher in Indonesia

To cite this article: Rahadian Zainul *et al* 2020 *J. Phys.: Conf. Ser.* **1594** 012023

View the [article online](#) for updates and enhancements.

You may also like

- [Moodle-Based Speaking Learning Model](#)
Nanan Abdul Manan, Emzir and Aceng Rahmat
- [Teaching using moodle in mathematics education](#)
A Handayanto, S Supandi and L Ariyanto
- [Study of the use and application of the moodle e-learning platform in high school](#)
Harry Dhika, Fitriana Destiawati, Michael Sonny *et al.*

Recent citations

- [Utilization of Moodle in Teaching Undergraduate Students in West Africa](#)
Kalyan Kumar Sahoo *et al*



The Electrochemical Society
Advancing solid state & electrochemical science & technology

241st ECS Meeting

May 29 – June 2, 2022 Vancouver • BC • Canada

Extended abstract submission deadline: Dec 17, 2021

Connect. Engage. Champion. Empower. Accelerate.
Move science forward



Submit your abstract



Development of e-Learning Courses for Subjects about 'Learn and Learning' with Moodle-based for Prospective Teacher in Indonesia

Rahadian Zainul^{1*}, Muhammad Adri¹, Sriadhi², Khaerudin³, Neni Wahyuningtyas³, Darni⁴, Rusdinal¹, Nasrun², Rahmulyani², Nuranjani², Nurmaniah², Agus Wedi³, Ence Surahman³, Eny Nur Aisyah³, Herlina Ike Oktaviani³, R. Sri Martini Meilanie³, Siti Nuraini Purnamawati³, Hapidin³, Winda Dewi Listyasari³, Irsyad¹, Syafril¹, Anisah¹, Yulianto Santoso¹, Muhardi⁶, Andi Kristanto⁴, Lamijan Hadi Susarno⁴, Dedi Kuswandi³, Ratna Wardani⁷, Evita Adnan³

¹Universitas Negeri Padang, Indonesia

²Universitas Negeri Medan, Indonesia

³Universitas Negeri Jakarta, Indonesia

⁴Universitas Negeri Malang, Indonesia

⁵Universitas Negeri Surabaya, Indonesia

⁶STMIK Hang Tuah Pekanbaru, Indonesia

⁷Universitas Negeri Yogyakarta, Indonesia

*corresponding author: rahadianzmsiphd@fmipa.unp.ac.id

Abstract. Online learning is the key to the implementation of learning in the Covid 19 pandemic and the New Normal era. The purpose of this study was to determine the effectiveness of the e-learning course on subjects 'Learn and Learning' with Moodle-based for prospective teachers in Indonesia. This research was conducted using the Berg and Gail development method. The development instruments were validated by experts, and further product development was carried out in an integrated and simultaneous manner by the Higher Education Research Consortium Team (KRUPT) from Padang State University, Malang State University, Jakarta State University, Medan State University and Surabaya State University. This product is declared valid by the Expert, both in content, design and IT. Tests were limited during the Covid 19 pandemic and data collection was carried out online. Data collected in the form of an online questionnaire to student respondents (n = 40). Based on respondent questionnaire data, this product was declared to be very suitable for online learning, reaching 3.967 which indicated the highly acceptance level. Based on this research, it was concluded that e-learning products for subjects with learning and learning subjects could be widely used in the Educational Personnel Education Institution in Indonesia.

Keywords: Effectiveness, e-Learning, Learn and Learning, Moodle

1. Introduction

During the Covid 19 pandemic, shifts in communication and interaction also hit the education sector. Did not escape, the learning process that occurred in Indonesia. One of them is lectures in



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

tertiary institutions that form teacher candidates, or better known as the Educational Institution (LPTK). However, the limitations of interaction have caused face-to-face learning to be an obstacle in achieving these goals (10, 19, 24).

Data from the Indonesia-Central University Organizing Alliance (Apperti) on March 14, 2020, there were 58 universities that changed their teaching methods. This data will continue to grow with the expansion of the Covid pandemic 19. One learning solution that can overcome this limitation is through online learning that is developed concerning standards and quality, both the content of the material, learning design and aspects of the information technology used. In online learning, the development of learning web applications has been very rapid. Various advantages and advantages and effects in learning have been studied by many researchers before (1-4, 6, 8, 12-13, 15, 17, 21-23, 25, 27). Various learning applications have been developed by programmers in collaboration with educational experts, such as ADAM (18, 20, 26), SAUCE(5, 11, 14), and Moodle(7, 9, 16).

No exception in learning in the subject of Learning and Learning, as one of the subjects that must be given to students who will become teachers in LPTK. But unfortunately, the application of web learning and online learning in this course has not been done much. In this research, researchers aimed to develop e-learning learning subjects 'Learning and Learning' using moodle to overcome the limitations of the implementation of learning in the pandemic era Covid 19 and the New Normal era. This research is widely an online learning solution in the field of education in Indonesia, especially in preparing teacher candidates to face the era of the industrial revolution 4.0.

2. Methodology

Respondents and Data Collection

This research was conducted on second-year students at Padang State University, as many as 40 respondents. Respondents will respond to the questionnaire conducted online, via Google Form.

Product Development

The development of e-learning products is carried out by the Berg and Gall development method. The application used is MOODLE (Modular Object-Oriented Dynamic Learning Environment) as a learning management system (LMS). Moodle application is Open Source and more stable and easy to configure as needed in learning.

The research phase, including the first stage, data collection (research and information collecting) the second stage is Planning. In this section, a study on the development of 'Learn and Learning' material is carried out.

The third stage, the development of product drafts (develop a preliminary form of product). This stage is done by developing learning tools and guidelines for blended learning. The fourth stage is Learning Revision, which includes designing and carrying out summative evaluations, conducting trials in the initial stages. The Fifth Stage, is a trial on limited use, such as a colleague. Evaluation at this stage focuses on several components of learning, such as the content of the material, strategies, and evaluations, as well as the overall learning model.

The Sixth Stage is the revision of e-learning products. The seventh stage is a field test. At this stage e-learning products that have been developed are evaluated by an expert (Expert Judgment), which consists of information technology experts (e-learning), content experts (evaluation material), and learning technology experts. The Eighth Stage is Revising e-learning products again. Ninth stage, field testing in real context. The tenth stage is the revision of the final product. This final stage is the implementation and dissemination, whether the product can be widely applied and is considered good by the user (respondent).

Instrument

The research instruments include product development instruments, validation instruments, and limited online test instruments through questionnaires to respondents. The three instruments developed adopted from research developed by Sriadhi through instruments that have been validated and can be accessed at researchgate (<https://www.researchgate.net/publication/334586889>). The

instrument developed was a modification of the **Sriadhi instrument** as illustrated in the following scheme.

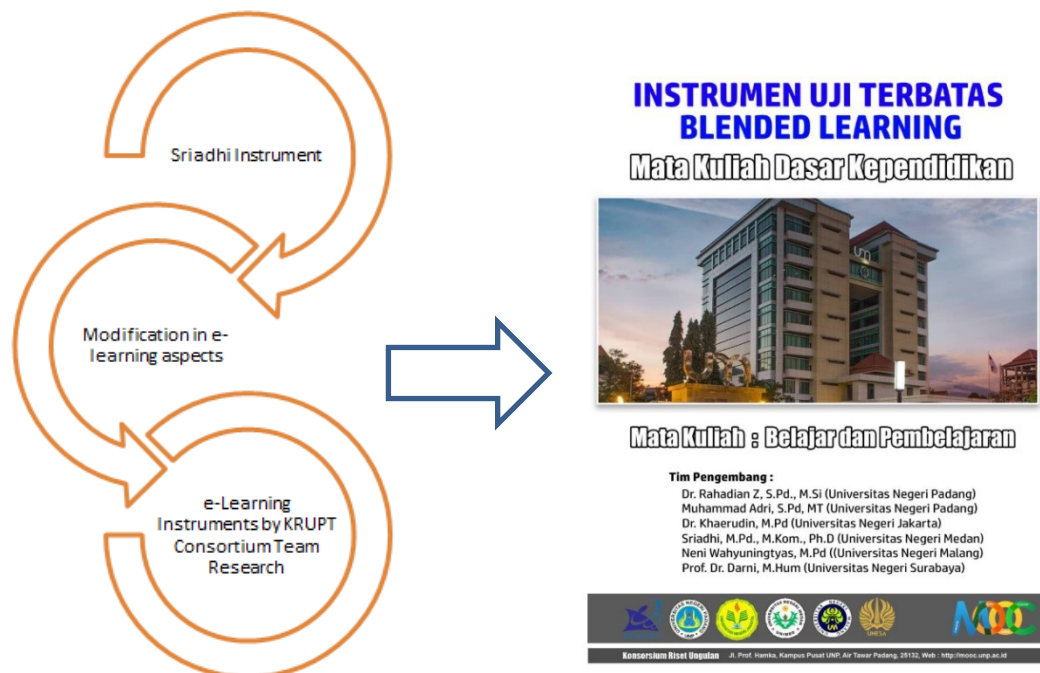


Figure 1. (a). Instrument Scheme for e-learning development research, validation and effectiveness testing (b). KRUPT instrument

Data Analysis and Interpretation

Data analysis uses Sriadhi's calculations and interpretations in the instruments he developed. These calculations and interpretations can be accessed at researchgate (<https://www.researchgate.net/publication/334586889>). Interpretation will result in the acceptance and feasibility assessment of the product. These acceptances include the following:

Table 1. Interpretation of Acceptance of e-learning products

No	Interval Mean Interpretation Score	Interpretation
1	1.00-2.49	Low Acceptability
2	2.50-3.32	Acceptance is sufficient
3	3.33-4.16	High Acceptability
4	4.17-5.00	Very High Acceptability

3. Results and Discussion

Product Elearning for 'Learn and Learning' Courses

The e-learning product developed by the College of Higher Education Research Consortium Research Team (KRUPT) uses Moodle version 3.75. Moodle is a Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). It is a Free web application that educators can use to create effective online learning sites. Moodle is released under the GNU General Public License. Development was carried out at WebHosting Padang

State University, <http://mooc.unp.ac.id/>. MOOC is the Massive Open Online Course of Padang State University.

Course learning products with the subject 'Learn and Learning' can be accessed at <http://mooc.unp.ac.id/course/view.php?id=6> .. The website's frontend (face) can be seen in Figure 2. On Figure 1 shows the face or front view of the developed website, with the logo of the Consortium Team. On the front page, the logo of Malang State University is displayed, because the content in this subject was specifically developed by the Consortium Team from Malang State University.



Figure 2. The e-learning display of the 'Learn and Learning' courses

The contents of this course can be seen in the first lecture until the end of the meeting. At the beginning of the lecture, e-learning provides guidance on how this product is run by students, lecturers and administrators. In its implementation, each section will have its own guide that is available on the e-learning website and can be downloaded directly after students have access to e-learning. The display of the e-learning which contains the tool parts to access the instructions and material can be seen in Figure 3.

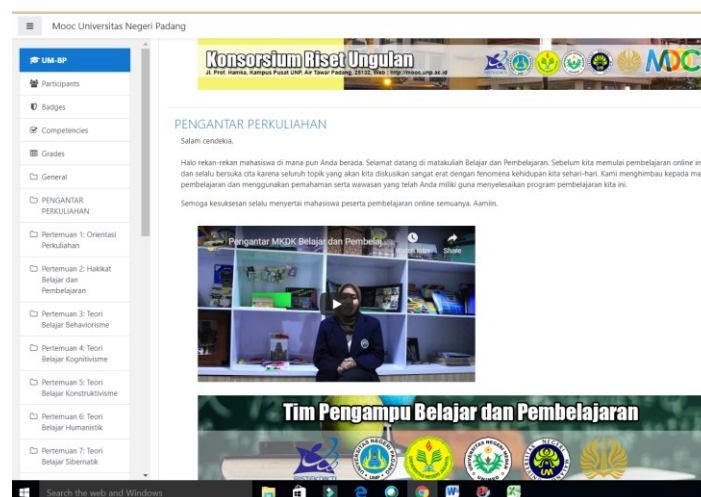


Figure 3. Display contents and features tools to access instructions, material and learning materials in e-learning

In e-learning developed all learning processes are controlled in an integrated manner through the learning participant account. Each student will get a username and password provided when they

are registered or register online to become a participant. This section is carried out as the beginning of the incorporation of students and the implementation of the online learning process.

At the end, evaluations can be given to students, both in the form of direct quizzes, as well as assignments given to be done at times outside the specified learning hours. In its implementation, the e-learning design developed by the consortium team is a flipped classroom. In this system there are three parts, namely before the class begins, when the class is running, and the last part is after the class ends or an independent task, as shown in Figure 4.

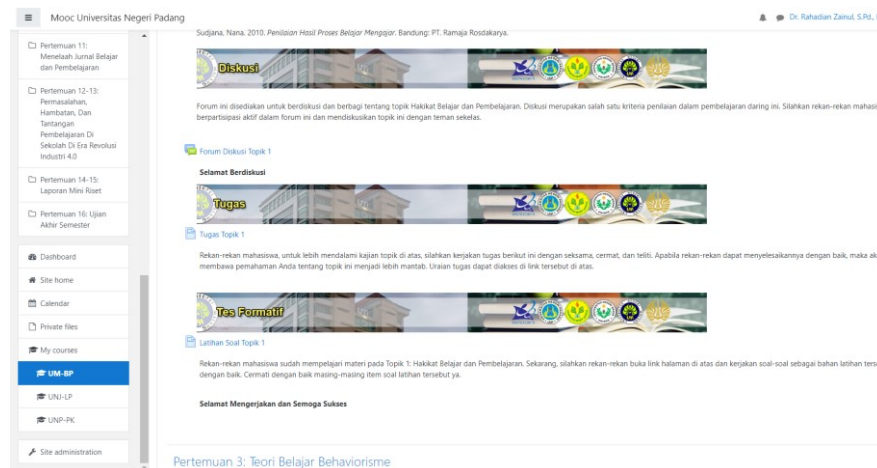


Figure 4. Display e-learning based on flipped classroom

Online Questionnaire Results

Based on the results of responses from respondents, as shown in Figure 5, e-learning products have a high acceptability. In Learning Aspects Materials and e-Learning Subject has the highest acceptance, which is 4,364. In the pedagogical aspect, it also has a high acceptance, which is 4,125. In e-learning design and facility, learning guides and information and aspects of evaluation in e-learning and activity in e-learning have a high level of acceptance, namely 3,960; 3,692; 3,563 and 3,606. These figures reflect that the product designed already has a high acceptability and is suitable for online learning in tertiary institutions.

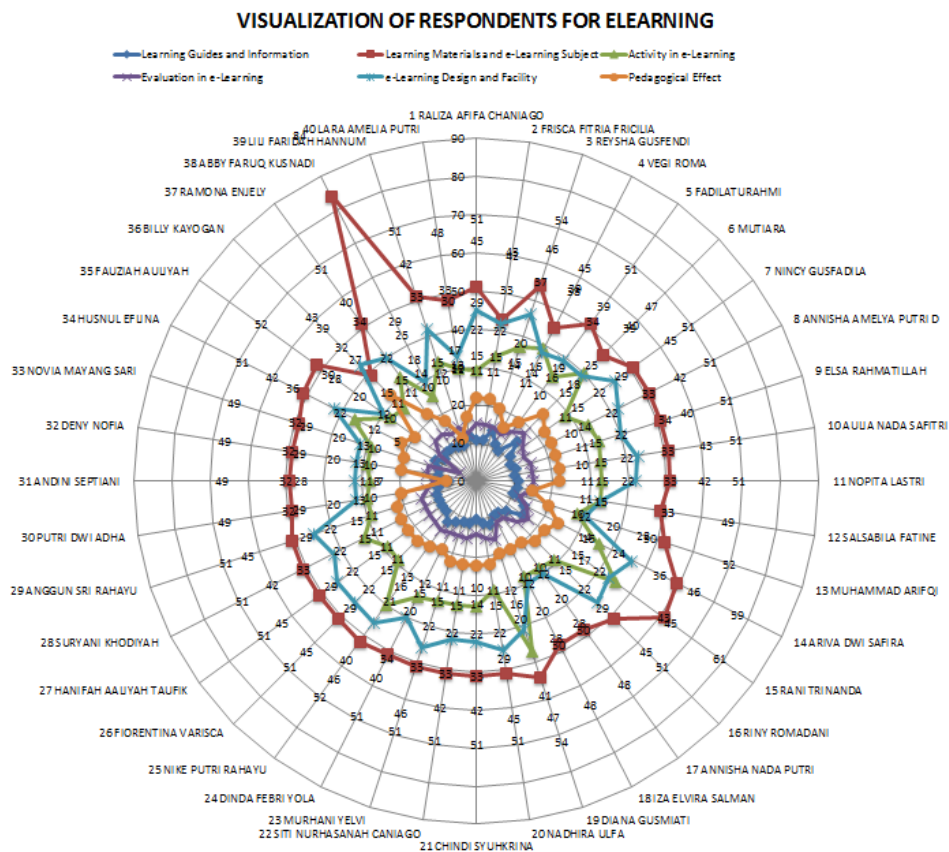


Figure 5. Visualization of respondents for e-learning with subject ‘Learn and Learning’

From the results of data processing of 40 respondents, high acceptance of the six aspects of e-learning were examined. Learning Materials and e-Learning Subjects ranked highest, at 19%. Furthermore, decreasing, pedagogical aspects (18%), e-learning design and facilities (17%), learning guides and information (16%) and aspects of evaluation in e-learning (15%) and activity in e-learning (15%)) as shown in Figure 6. From these results it appears that the substance of the contents of the lecture material has the most decisive factor in the assessment given by respondents of the e-learning that is made. This result is in line with research that has been done by several previous experts (12).

Guo, P., et al. (2020) revealed that there are two aspects of online learning that will be obtained, namely cognitive aspects and behavioral aspects. Cognitive outcomes (i.e. knowledge and cognitive strategies) and behavioral outcomes (i.e. skills and engagement) were measured by questionnaires, rubrics, tests, interviews, observations, self-reflection journals, artifacts, and log data. The outcome of artifact performance was assessed by rubrics (12). In line with this, Jowsey, T., et al. (2020) also revealed patterns of access to the topic of blended learning in several databases. There are six databases (EBSCOHOST (CINHAL plus; Education research Complete; Australia / New Zealand Reference Center); Google Scholar; EMBASE (Ovid) [ERIC (Ovid); Medline (Ovid)]; PubMed: ProQuest Education Journals & ProQuest Nursing & Allied Health Source) for the period 2005 – December 2015. Four key themes were identified in the literature: active learning, technological barriers, support, and communication. The results suggest that when delivered purposefully, blended learning can positively influence and impact on the achievements of students, especially when utilized to manage and support distance education (15).

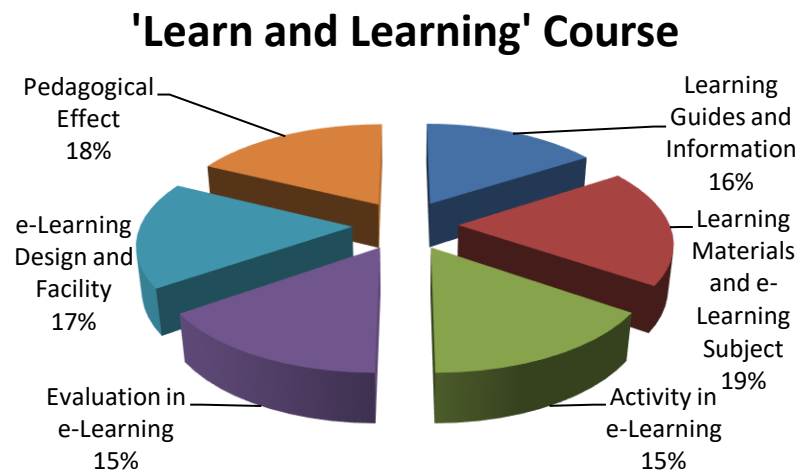


Figure 6. Diagram of aspects of e-learning that determine product quality

4. Conclusion

From this research it was concluded that the subject's e-learning products about 'Learning and Learning' have high acceptances and can be used in online learning at the Educational Personnel Educational Institution. The results of the analysis of the responses given by respondents reached 3,967 which means this product has a high level of acceptance and is suitable for use in tertiary institutions. This research suggests the need for continuous improvement of material content and in accordance with the times. During the Covid 19 pandemic, the implementation of e-learning could be a solution for the learning process that was limited due to social restrictions and keep a distance between students and lecturers in the lectures that were designed.

5. Acknowledgment

This research was funded by the **Ministry of Research and Higher Education of the Republic of Indonesia** in the 2019-2020 **College Research Consortium (KRUP)** Research for the first year. The research contract number is **249/SP2H/LT/DRPM/2019**.

References

1. Aksoy ME, Guven F, Sayali ME, Kitapcioglu D. (2019). The effect of web-based learning in pediatric basic life support (P-BLS) training. *Computers in Human Behavior*.94:56-61.
2. Atabekova A, Belousov A, Shoustikova T. (2015). Web 3.0-Based Non-formal Learning to Meet the Third Millennium Education Requirements: University Students' Perceptions. *Procedia - Social and Behavioral Sciences*.214:511-9.
3. Bano M, Zowghi D, Kearney M, Schuck S, Aubusson P. (2018). Mobile learning for science and mathematics school education: A systematic review of empirical evidence. *Computers & Education*.121:30-58.
4. Barisone M, Bagnasco A, Aleo G, Catania G, Bona M, Gabriele Scaglia S, et al. (2019). The effectiveness of web-based learning in supporting the development of nursing students' practical skills during clinical placements: A qualitative study. *Nurse Education in Practice*.37:56-61.
5. Barros H, Silva A, Costa E, Bittencourt II, Holanda O, Sales L. (2011). Steps, techniques, and technologies for the development of intelligent applications based on Semantic Web Services: A case study in e-learning systems. *Engineering Applications of Artificial Intelligence*.24(8):1355-67.
6. Barteit S, Guzek D, Jahn A, Bärnighausen T, Jorge MM, Neuhann F. (2020). Evaluation of e-learning for medical education in low- and middle-income countries: A systematic review. *Computers & Education*.145:103726.

7. Caputi V, Garrido A. (2015). Student-oriented planning of e-learning contents for Moodle. *Journal of Network and Computer Applications*.53:115-27.
8. Chen H-R, Tseng H-F. (2012). Factors that influence acceptance of web-based e-learning systems for the in-service education of junior high school teachers in Taiwan. *Evaluation and Program Planning*.35(3):398-406.
9. Costa C, Alvelos H, Teixeira L. (2012). The Use of Moodle e-learning Platform: A Study in a Portuguese University. *Procedia Technology*.5:334-43.
10. Gaur S, Pandya N, Dumyati G, Nace DA, Pandya K, Jump RLP. (2020). A Structured Tool for Communication and Care Planning in the Era of the COVID-19 Pandemic. *Journal of the American Medical Directors Association*.
11. Gladun A, Rogushina J, Garcí'a-Sanchez F, Martínez-Béjar R, Fernández-Breis JT. (2009). An application of intelligent techniques and semantic web technologies in e-learning environments. *Expert Systems with Applications*.36(2, Part 1):1922-31.
12. Guo P, Saab N, Post LS, Admiraal W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*.102:101586.
13. Hooshyar D, Pedaste M, Saks K, Leijen Ä, Bardone E, Wang M. (2020). Open learner models in supporting self-regulated learning in higher education: A systematic literature review. *Computers & Education*.154:103878.
14. Hundt C, Schlarb M, Schmidt B. (2017). SAUCE: A web application for interactive teaching and learning of parallel programming. *Journal of Parallel and Distributed Computing*.105:163-73.
15. Jowsey T, Foster G, Cooper-Ioelu P, Jacobs S. (2020). Blended learning via distance in pre-registration nursing education: A scoping review. *Nurse Education in Practice*.44:102775.
16. Kolekar SV, Pai RM, Pai M.M M. (2018). Adaptive User Interface for Moodle based E-learning System using Learning Styles. *Procedia Computer Science*.135:606-15.
17. Lin Y-R, Fan B, Xie K. (2020). The influence of a web-based learning environment on low achievers' science argumentation. *Computers & Education*.151:103860.
18. Lin Y-T, Jou M. (2012). A Web Application Supported Learning Environment for Enhancing Classroom Teaching and Learning Experiences. *Procedia - Social and Behavioral Sciences*.64:1-11.
19. Matalon SA, Souza DAT, Gaviola GC, Silverman SG, Mayo-Smith WW, Lee LK. (2020). Trainee and Attending Perspectives on Remote Radiology Readouts in the Era of the COVID-19 Pandemic. *Academic Radiology*.
20. Mavrikios D, Sipsas K, Smparounis K, Rentzos L, Chryssolouris G. (2017). A Web-based Application for Classifying Teaching and Learning Factories. *Procedia Manufacturing*.9:222-8.
21. Park M, Jeong M, Lee M, Cullen L. (2020). Web-based experiential learning strategies to enhance the evidence-based-practice competence of undergraduate nursing students. *Nurse Education Today*.91:104466.
22. Scamell M, Hanley T. (2017). Innovation in preregistration midwifery education: Web based interactive storytelling learning. *Midwifery*.50:93-8.
23. Shen C-w, Ho J-t. (2020). Technology-enhanced learning in higher education: A bibliometric analysis with latent semantic approach. *Computers in Human Behavior*.104:106177.
24. Stambough JB, Curtin BM, Gililland JM, Guild GN, Kain MS, Karas V, et al. (2020). The Past, Present, and Future of Orthopedic Education: Lessons Learned From the COVID-19 Pandemic. *The Journal of Arthroplasty*.
25. Torres Kompen R, Edirisingha P, Canaleta X, Alsina M, Monguet JM. (2019). Personal learning Environments based on Web 2.0 services in higher education. *Telematics and Informatics*.38:194-206.
26. Wang C, Wang D-Z, Lin J-L. (2010). ADAM: An adaptive multimedia content description mechanism and its application in web-based learning. *Expert Systems with Applications*.37(12):8639-49.
27. Wood R, Shirazi S. (2020). A systematic review of audience response systems for teaching and learning in higher education: The student experience. *Computers & Education*.153:103896.