JOURNAL OF E-LEARNING AND KNOWLEDGE SOCIETY Vol. 19, No. 4 (2023), pp. 1-8

### Navigating the Digital Classroom: Exploring the Effectiveness of Online-Based Learning

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*(submitted: ; accepted: ; published: )*

**Abstract(soon)**

**KEYWORDS: Online Based-Learning, technology**

**DOI**

soon

**CITE AS**

Budi, B.C., & Latupeirissa, L.C. (2024). Navigating the Digital Classroom: Exploring the Effectiveness of Online-Based Learning. *Journal of e-Learning and Knowledge Society*, *19*(4), 1-8.

doi

##### Introduction

Online based learning is learning not directly, but online. The online based learning has become a main focus in modern education, especially in facing global challenges like the pandemic which forces drastic adjusment in learning method. In an era where technology plays an active role in changing the role of distance education from an alternative to the classroom into a social transformation by providing access to education for all[1].

This effectiveness is very important because it can improve people's performance in learning where this can be influenced by many things. This can be seen in the current era where online based learning must have a positive impact on users, not become an obstacle. These positive impacts can be various, such as being able to enable people to access a wide range of materials without limitations and increasing collaboration between students, supporting students' constructivist learning and so on[1], [5].

However, in implementing online based learning, there are challenges that need to be faced. This challenge usually interferes with the effectiveness of implementing online based learning. Therefore, we want to research what factors influence the effectiveness of online based learning. We also want to know how long people have been using online based learning. This can be a solution later for obstacles in implementing online based learning[6].

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1. **Related Work**

*ROLE OF OPEN EDUCATIONAL RESOURCES*

T. Caswell, S. Henson, M. Jensen, and D. Wiley explore the pivotal role of Open Educational Resources in supporting free education. They argue that technology has reduced the reproduction costs of educational content to almost nothing, enabling educators to share their course materials globally at minimal or no cost. This significant shift not only democratizes education but also repositions distance education from an alternative to traditional classroom settings to a transformative force in society [1].

Despite the supply of high-quality open educational resources, their usage is quite low which brings questions to why. Richter and McPherson explore the low usage of the resources, suggesting that a capable supply of resources, does not guarantee sustainable accessibility. They emphasize the need to adapt these resources to local contexts, making it more relevant in various educational settings and geographical locations. The paper also dives into the challenges of online learning in conventional education in developing countries with high illiteracy. The authors conclude that a subtle approach, is essential for integrating high-quality open educational resources into various educational landscapes[3].

*STUDENT ENGAGEMENT AND LEARNING OUTCOMES IN ONLINE LEARNING*

Gray and DiLoreto delve into the impact of course structure, learner interaction, and instructor presence on student satisfaction and perceived learning in online learning environments. Their research emphasizes the importance of student engagement, revealing how it mediates the relationship between the design and delivery of online courses and their effectiveness in enhancing learning outcomes [2].

Chen and Jang's study researches the motivation within online learning from the perspective of Self-Determination Theory. Their research underscores the importance of addressing learners' motivational factors and the critical role of contextual support in igniting the motivation to learn. The authors implemented structural equation modeling to analyze data from participants in online certificate programs, revealing that the satisfaction of learners' needs for autonomy, competence, and relatedness mediates the relationship between contextual support and learner motivation. Although their findings indicated that such motivational factors did not directly predict learning outcomes, they emphasized the necessity of integrating supportive strategies that cater to the individual needs of learners to enhance their motivation effectively [4].

*TECH FOUNDATIONS AND DIGITAL LITERACY FOR ONLINE LEARNING*

Watson and Lee Watson’s paper provides an investigation of Learning Management Systems (LMS), looking into their development, functionality, and differentiation from similar concepts such as Course Management Systems (CMS) and Learning Content Management Systems (LCMS). The authors argue that LMS is a foundation for transitioning from the Industrial to the Digital Age which involves focusing on educational paradigms that focuses on student-centered approaches, flexible customization to meet various student needs, and the integration of technology to support individualized learning pathways[7].

Akhyar et al. made a study to find the impact of digital literacy on learning outcomes among students engaging in online learning. Using a quantitative approach with 348 students as the sample, the study uses simple linear regression analysis to examine the relationship between digital literacy and learning outcomes. The method reveals a positive correlation between them, with digital literacy having 37.1% of the variance in students' learning outcomes. This points out the vital role that digital literacy contributes in creating effective online learning environments. The study's results highlight the need for educational stakeholders to prioritize the development of digital literacy skills among students to enhance their learning outcomes in online settings[8].

1. **Methodology**  
   This chapter goes over our mixed-methods (Qualitative & Quantitative) approach to investigate the effectiveness of online learning. By collecting qualitative and quantitative data and analyzing them based on survey response and literature review. This mixed-methods approach will allow us to get a comprehensive understanding about the factors that affect online learning effectiveness and the metrics of people that use online learning services.
2. *Data Collection*

Survey Methodology  
We use survey methods to get general data such as age, gender, etc. Apart from that, we also collect data that supports our paper, such as motivation, reasons for choosing online based learning applications and so on. We made this survey targeting students who are currently studying around the age of 18-25, where at that age people have already used online based learning. That way, we can get important data to develop our paper

1. *Quantitative*  
   Quantitative data will be collected based on answers from survey respondents that includes metrics such as age, occupation (Student / Non-Student), demographics and frequency of using online learning.
2. *Qualitative*

Qualitative data will be collected based on answer from survey that will dive into various personal questions like learning barriers, personal motivation and improvement suggestions for online learning platforms.

1. *Data Analysis*

Literature Review

We use the literature review method because we also want to know important information from several previous papers which discuss online based learning/are close to the topic of online based learning. This is used to support our paper to be more valid. So apart from the survey, we also compared it with a literature review to make it more valid. From this literature review we get information about what factors influence the effectiveness of online based learning, whether web interaction influences it or not, what CMS and LMS are, the average classification of samples that use online based learning and so on. We can get this from the abstract, research method, and conclusions.

1. *Quantitative*

We get quantitative data from several papers use Literature Review where we look at the results/graphs of the results of the paper and then draw conclusions, such as the average age of the sample used in the paper, occupation, how long people have used online based learning from the sample.

1. *Qualitative*

We get qualitative data from several papers use Literature Review method where we see the summary results of the paper. This summary result can be from the conclusion, abstract of a paper

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