

Mobile Learning Trend in Vocational High School

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Abstract. This study synthesized the findings of studies on mobile learning trends in the vocational education learning process by scrutinizing journals from 2018 to 2022. This paper focused on the challenges and opportunities associated with the use of mobile in learning, as well as students' and teachers' readiness to use technology in the learning process. The trend of using mobile learning is growing, forcing distance learning to take place, and increasing the pressure on educational institutions to develop innovative learning and media that can still support the learning process. Given the trend of an increasingly dynamic and mobile society, as well as the demand for quality and diverse educational needs, the potential and prospects for developing mobile learning in the future are extremely promising. The learning concept is expected to encourage the creation of an effective and innovative learning environment to motivate students and teachers to learn.

Keywords: mobile learning, vocational education, distance learning.

1 Introduction

The use of Information and Communication Technology (ICT) in education is evolving in a variety of strategies and patterns, which can be broadly classified as an electronic learning (e-learning) system as a learning model that employs electronic devices and digital media and mobile learning as a form of learning that utilizes mobile communication devices and technologies. ICT has enabled many new learning breakthroughs [1], [2]. One example is mobile learning (device-based learning). The rapid development of mobile technology, both in terms of networks and equipment (devices), has caused this technology to advance at an astounding rate. It is no surprise that today's mobile phone users are easy to find, even in remote and rural areas [3]. Mobile technology is rapidly evolving in areas such as connectivity, third-generation (3G) mobile communications, Worldwide Interoperability for Microwave Access (WiMAX), as well as devices such as smartphones, pocket PCs, tablet PCs, and various types of Personal Data Assistants (PDAs) [4].

The very fast growth rate of mobile devices has been affected by the easiness of using the devices, which makes them easy to accept. The price of devices that are increasingly affordable compared to personal computers (PCs) and the cheaper rate price are the driving factors in the development and application of mobile learning as a new model in learning activities [5]. The

range of wireless/cellular services is expanding due to lower costs and increasingly developed and sophisticated features. Furthermore, mobile learning can create a flexible learning paradigm that can be used anywhere and at any time.

These students' mobile phones, on average, have advanced features and the ability to run content in the form of multimedia and software applications. Moreover, the ease of access to the internet via mobile phone devices such as Blackberries, iPhones, PDAs, and other smartphones. Besides, mobile phone network access and data transfer are becoming less expensive and faster [6].

The purpose of this study was to look into the trend of mobile learning in the world of education as one of the solutions used to meet the demands of quality and diversity in educational needs. Educators and researchers could use this data to identify unanswered issues or questions in the literature and define future research directions in the context of mobile learning trends in education.

2 Literature Review

2.1 E-Learning in Vocational Education

E-learning is a learning technology based on ICT that is widely used in vocational education and training. This acceptance makes sense in the context of preparing human resources with ICT skills to address employment issues and maintain economic stability [7]. Furthermore, e-learning is a component of ICT, which has emerged as a critical skill in both social and professional life [8].

E-learning is becoming increasingly important in vocational education settings to promote employability skills through innovative, practical learning [9]. E-learning in vocational education allows students and teachers/instructors to interact virtually without physical contact, particularly with the support of internet connectivity, availability and affordability of network service providers that allow students to download virtual course materials, lab guides, and perform virtual lab experiments [10].

In practice, e-learning necessitates the use of technology. Dimensions of e-learning technology will address infrastructure planning, hardware (hardware), and software issues (software). Infrastructure planning for technical and technological capabilities, user support skills (teachers/instructors and students), standards and guidelines for e-learning implementation, and technology infrastructure policies [11].

Computers, servers, modems, network devices, wireless devices, printers, scanners, cameras, microphones, and file storage devices are examples of hardware (hard drives, CD-ROMs, and DVDs). Word processing software, e-mail software, presentation software, graphics software, e-readers, browsers and plug-ins, spreadsheets, databases, learning management systems (LMS) such as Moodle, ATutor, blackboard, Dokeos, ILIAS, and others, learning content management systems (LCMS), authoring tools, and enterprise software [12].

The presence of new technological devices, specifically mobile devices that can be used or utilized for learning, is increasingly supporting e-learning technology (m-learning). The

emergence of mobile devices with wireless systems, such as cellular phones, smartphones, PDAs, and tablets, has the potential to create a more flexible learning environment and expand the role of m-learning as an e-learning platform [13].

2.1 Mobile Learning in Vocational Education

Mobile learning (m-learning) is mobile device-based learning. M-learning is a new learning model in formal and informal education that has been widely adopted in several developed countries and is now being adopted by developing countries. M-learning in vocational education has the same function [14]. Mentioned the function of mobile technology includes capturing work situations in the workplace, using technology in the classroom by developing learning activities that are reflections of experience, and re-validating knowledge in the workplace described at school during the learning phase.

The aforementioned function represents a challenge in encouraging the need to reflect on work experience in vocational education. This reflection can take place while in action (during training) or after action (after or before training). Training is a systematic and planned effort to change and develop knowledge through learning experiences. Furthermore, that reflection on actions taken during or before training can occur during the learning process or the integration of knowledge gained in school and workplace experience [15]. M-learning in vocational education can be used as a technology function to obtain meaningful information, communication, and collaboration. This will enhance students' knowledge and learning experience as they prepare for the world of work and further education.

3 Method

The literature review was found by searching the Web of Science database and then Scopus using a bibliometric analysis system with the keywords "mobile learning trends" and "vocational education." As a result, there were 200 articles published between 2018 and 2022 in the last five years. The VOSviewer program was used to read, analyze, and code the 200 articles. The data from the search results are then analyzed with the VOSviewer software. Statistics research topics can be discovered using co-occurrence analysis. The process of counting paired data in a collection unit is known as co-occurrence analysis. This analysis yielded a bibliometric visualization map. VOSviewer currently can only analyze English words and terms. The binary method and the full counting method were used in this analysis to calculate words. The binary method counts only the occurrence or non-occurrence of a word/term, regardless of how many times it appears in the paper. The full-counting method, on the other hand, counts the number of occurrences of words in the paper. The results were then compared in this analysis. Several important papers in each group of analysis results were reviewed for abstracts and content to be summarized as literature review material for discussion publications on mobile learning trends in vocational education learning.

4 Results and Discussion

4.1 Result

The results of the co-occurrence analysis in the search results obtained 93 titles of articles related to research on mobile learning trends in learning in vocational education. Based on the data obtained by researchers from ProQuest, with a minimum number of keywords appearing 5 out of 544 keywords, 17 keywords meet the threshold with the following description:

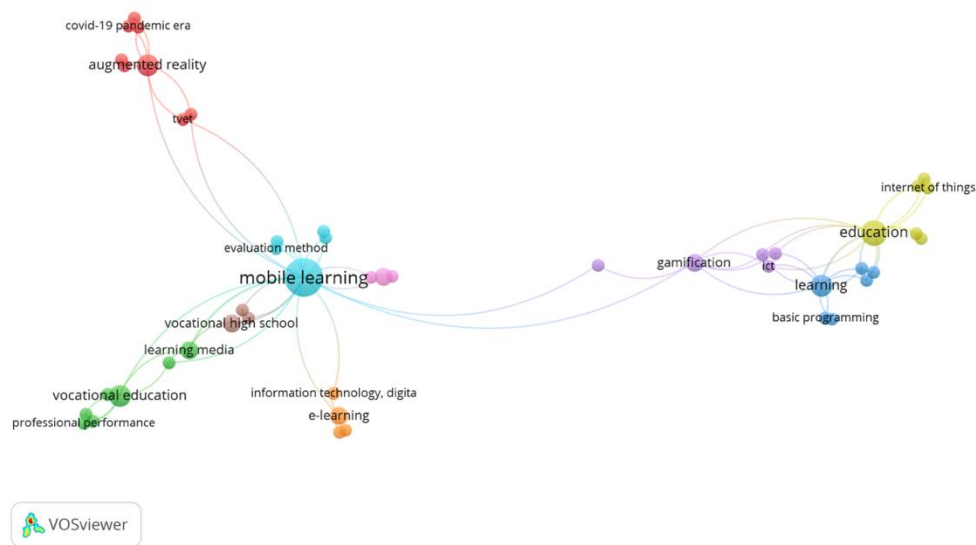


Fig. 1. Results of Visualization Using VOSViewer.

The scientists found 9 clusters in the visualization of the 47 keywords generated in the image above, including Cluster 1 (Augmented Reality, TVET and COVID-19 Pandemic Era). Cluster 2 consists of learning media and vocational education. Cluster 3 is learning teaching and basic programming. Cluster 4 consists of education and the internet of things. Cluster 5 consists of human-computer, game design, element learning, and gamification. Cluster 6 consists of mobile learning, mobile-based assessment, and evaluation method. Cluster 7 consists of Information technology, digital, e-learning and e-learning systems. Cluster 8 consists of potential utilization and vocational education. Cluster 9 is concerned with mobile technology. In 2019, 11 scholarly journals published the most articles. Based on a bibliometric analysis of 93 papers indexed in the Google Scholar database, it is possible to see how mobile learning trend research is evolving. Research on general m-learning trends can be divided into two broad categories: research on m-learning trends in vocational education and research on m-learning trends in distance education. These two research groups, while related, show a fairly significant grouping.

4.2 Discussion

The challenges of individual needs with high complexity in various aspects of life are the demands of the twenty-first century. The challenges of 21st-century vocational education are to build a knowledgeable society with skills such as critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership, cross-cultural understanding

and communication, information, and media literacy, computing and ICT literacy, career and learning self-reliance [8]. The learning transformation is increasingly moving toward the use of digital technology, including the incorporation of m-learning [16].

Digital and application-based learning and teaching processes are incorporated into mobile learning. M-learning makes use of digital applications on mobile devices [17]. For example, video applications, learning materials stored in the cloud, or cloud computing, as well as a chat application that allows students and teachers to communicate with one another. M-learning is a digital learning and teaching procedure. Students and teachers can create and share learning presentations, watch and download instructional videos, take tests on smartphones or laptops, and even enroll in open courses attended by thousands of students worldwide. International journals and books are also more easily accessible [18]. The incorporation of m-learning in learning benefits both students and teachers because students can learn at any time and from any location [19]. Students can access learning materials anywhere and at any time with m-learning and teaching. The student's study schedule becomes more flexible in learning according to his preferred learning style. Teachers can easily provide students with learning materials, and communicating with students' parents is also simplified.

Another advantage of m-learning is that students become more comfortable with all-digital thinking and are more accustomed to completing tasks using devices [20]. Students will become more familiar and prepared with technology and the internet, which are now in the job requirements and professions [21]. According to statistical data from research findings, the demand for mobile learning is quite high. In Southeast Asia, the demand for m-learning has the potential to be greater than in other countries around the world. This is because technological development and smartphone purchases are relatively high in Southeast Asia. Moreover, the online education industry in Indonesia is ranked eighth in the world. M-learning can also help students learn five times more material without increasing study time.

5 Conclusion

M-learning is a learning model that makes use of cellular technology and mobile devices as learning media. M-learning is created in a multimedia format that presents text, images, and audio and minimizes video and animation due to the limited content size so that it can be easily accessed via mobile phone, making it interesting and simple to understand learning material. M-learning is an alternative learning model with characteristics that are accessible regardless of location and time. Given the trend of an increasingly dynamic and mobile society, as well as the demand for quality and diverse educational needs, the potential and prospects for developing mobile learning in the future are extremely promising, especially in vocational education, which is constantly changing and evolving. The learning concept is expected to encourage the creation of an effective and innovative learning environment to motivate students and teachers to learn.

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