



## **Adopting Learning Management System in Indonesian Higher Education: The Encountering Challenges to the Transformation**

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### **Declaration form**

This is an original publication which has not been published elsewhere and is not under consideration elsewhere.

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### **Abstract**

As a third world country, Indonesia undergoes a huge digital divide compared to other developed nations. With this condition, educators and university staff should transform the practices of education by adapting to technological platforms of Learning Management Systems (LMS) as one of the ways to accelerate the increasing quality of Indonesian education. The purpose of this paper is, therefore, to evaluate the implementation of LMS in Indonesian higher educations. There are three aspects elaborated from the practices: technical issue, organisational issue, and demographic issue. It is found that the major problem with the technical issue is the lack of teachers' expertise on computers literacy. Furthermore, the lack of systematic procedure in implementing the system, the absence of faculty members' commitment towards the transformation, and the less involvement of university leaders in promoting the system are concluded as challenges from the organisational issue. From the demographic issue, it is apparent that the government should provide equal educational access across Indonesia for the new transformation to be effective. Given the various challenges, some further recommendations are offered to tackle the problems.

**Keywords:** Digital Technology, Learning Management Systems, Indonesian Higher Educations.

### **Introduction**

The rapid development of the digital technology has offered various benefits for educators in conducting teaching and learning practices. The face to face mode of teaching and learning can now be integrated with the use of technological supports such as computers and the internet to be employed as the medium of an online delivery mode of learning. In many universities around the globe, the Learning Management System (LMS) has been widely used in educational contexts. LMS can be defined as a web-based learning system that is used for

planning and delivering materials, tracking students' development, and mediating synchronous and asynchronous communication among learners and educators through online (Unwin et al., 2010).

The potential of this system to be employed in teaching and learning practices in higher education is continuously discussed. Some researchers established that managing the courses through technological platforms such as *Moodle*, *Blackboard* and *Edmodo* can encourage the deeper sense of connection and allow students to have more access to open resources in learning (Dougiamas & Taylor, 2003; Watson & Watson, 2007).

The great advantages and the increasing trend of the LMS in developed countries have also motivated policy makers in Indonesian higher educations to spend a large amount of investment to adopt and incorporate similar platforms in their institutions. However, despite the great benefits of employing the LMS to support teaching and learning, there are some obstacles influencing its effectiveness in terms of technical, organisational, and social problems that need to be carefully evaluated before being able to maximise the usage of the system. Therefore, it is argued that the digital technology, particularly the LMS platform, has not changed the teaching and learning practices in the context of Indonesia as a developing country.

### **Purpose and Objectives**

The purpose of this paper is to evaluate using current information and literature the implementation of LMS in Indonesian higher education particularly to identify several problems occurred which limit the success of the LMS platforms to be implemented in teaching and learning practices. Looking at whether higher educations in Indonesia are well prepared to conduct the teaching and learning practices using the LMS platform is significant in order to gain insights on what to do to encourage the effectiveness of teaching and learning in Indonesian Higher Education.

The objective of this study is to review existing and available literature on the dynamics of LMS implementation in Indonesian higher education; to consider various benefits of the LMS implementation; to identify some problems encountered by policy makers, institutional leaders, lecturers and students in optimizing the potential benefits of the LMS implementation; and to address recommendations in which the policy makers, institutional leaders, lectures and students can respond so that the expected outcomes of the LMS implementation could be achieved. The results of this investigation are expected to influence how policy makers, university leaders, lecturers, staffs and students can adapt and understand their new roles in the implementation of LMS.

## **Methodology**

The methodology of this study was a synthesis research in which the existing empirical studies surrounding the issue of learning management system in higher educational institutions are descriptively integrated and synthesized. Onwuegbuzie, Leach, & Collins (2011) explain this method of research as the process where data and result from previous empirical studies are evaluated and mixed to be able to draw conclusions. To be able to gain worthy empirical and conceptual data, Monash University database have become the main source of literature. Eric Journal and Scopus have been the major sources of literature search as those journals providers are highly recognized in educational field. Specific keywords such as ‘learning management system’, ‘blended learning’, and ‘educational technology’ were typed and used in order to broaden and specify the search. It was aided with the use of Boolean operators (AND, OR, and NOT) to further focus the search. Reference list of the selected literature have also been manually checked to evaluate the provenance of authors in the field of educational technology and learning management system. After an exhaustive search and selection of literature, based on the relevance of the literature and the objectivity of the authors, the final list of research articles were examined and synthesised.

The discussion of this review will be organised in two sections. Firstly, an overview of regulation and actual implementation of LMS in Indonesian higher educations will be presented. Secondly, the challenges of LMS based on technical and sociocultural issues will be elaborated that will also be followed with some recommendations.

## **Discussion**

### **LMS in Indonesian’s Higher Education: An Overview**

Before discussing and evaluating the effectiveness of LMS implementation in Indonesian higher education, it is important to look at the regulated policy of educational system towards the use of information and communication technology (ICT). In this section, the concerns will be on the national policy transformation towards educational technology and the actual implementation of LMS platforms in higher education in Indonesia.

The improvement for the educational system of Indonesia has been the focus of the government in recent years. The government has realised that as a third world country, Indonesia undergoes a huge digital divide compared to other developed nations. Quibria, Ahmed, Tschang, and Reyes-Macasaquit (2003) expressed that some educators in developing countries in Asia, particularly Indonesia, have experienced difficulties in the educational system dealing with and providing support regarding the technological devices. These

difficulties have led to huge gap with other developed nations in terms of delivering materials and accessing online resources and information. Similarly, Hussein, Aditiawarman, and Mohamed (2007) stated that the use of technology-based components in Indonesian higher education is less progressive compared to developed nations, or even compared to other South East Asian countries such as Thailand, Singapore, and Malaysia.

Having realised the problem, policy makers in Indonesia had tried to bridge and minimise the gap by investing more funding in educational field by increasing the allocation of national expenditure up to 20% since 2008 (Asian Development Bank & OECD, 2015). Another transformational decision to encourage the use of information and technology in education that has been taken by the national government is establishing 'Presidential Decree Number 66 the year 2010'. The program states that the higher educational institutions are inquired to integrate the model of a virtual and distance learning with the face to face mode of teaching and learning practices in universities (Indonesian Ministry of Higher Education, 2011). With this national policy, educators and university staffs have to transform the practices of education by adapting to technological platforms of LMS in order to fulfil the demand of the central government and Indonesian Ministry of Higher Education.

For the government, the integration of technology in educational institutions with the use of LMS is believed as one of the ways to accelerate the increasing quality of higher education in Indonesia. However, the actual implementation of universities to the system is far from ideal because it is difficult for many universities to fulfil the demand of the government to radically shift the educational practices from non-mediated technology teaching to LMS platforms. This radical changing on the nature of teaching and learning has made educators frustrated in doing their roles because of the inadequate skills to integrate technological devices such as *Blackboard*, *Edmodo* and *Moodle* in their teaching practices. Besides, the culture of learning through technology-based platform has not properly shaped through all the elements of higher institutions including educators, staff, students, and even university leaders.

What reveals in the higher educational practices in Indonesia has been alerted by Selwyn (2016) suggesting that the use of technology in schools or institutions has been wrongly interpreted by most of the policy makers. The policy makers think it is adequate to simply incorporate technology in education and therefore will automatically enhance and transform the teaching and learning process. In fact, several problems such as the lack of human resources and infrastructural provision might occur if there is not enough preparation to make the transformation. One of the most crucial elements of incorporating a new technological system in a university is the readiness of institutions itself. In succeeding the adoption and

implementation of a new platform of LMS, many different aspects of education should be upgraded and improved. These aspects cover not only the technical skills of using LMS in teaching and assessing students but also organisational issues that the whole members of institutions should be embedded in the system. If all the institutional elements are not involved, it is almost impossible to run the LMS in a proper way.

To sum up, this section has attempted to provide a brief summary relating to the regulations of Indonesian government towards the use of LMS in higher institutions and the surface of the LMS implementation in Indonesia. It can be concluded that the universities are struggling with an adaptation of the new transformational policy of technological platform of LMS to achieve the maximum outcomes. In the light of the fact that the policy makers are radically shifting from the non-mediated technology teaching and learning to using the technology-based platform, the changes and transformations would meet some other challenges that will be discussed in the following section.

### **The Challenges of LMS Adoption**

To this point, the discussion has been the regulation and the actual implementation of LMS in Indonesian higher education. In this section, I will now move on to review the challenges faced by the government and educators in higher institutions to adopt the LMS system in the teaching and learning process. There are three aspects of challenge that will be further elaborated: technical issue, organizational issue, and demographic and sociocultural issue.

#### **a. Technical Challenges**

For the successful integration of the LMS platforms to the educational system in higher education, the fundamental issue that needs to be considered is the technical issue namely the capacity of human resources in using IT systems and also the availability of advanced technological infrastructure to support the LMS (Quimno, Imran, & Turner, 2013). These two key challenges can generally be seen faced by developing countries when they just started to adjust to the new transformational idea of technology-based platforms (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012; Quimno et al., 2013). The similar condition can be found in Indonesian education context where a top-down pressure from governments and societies to give a place for the use of technological platforms in teaching and learning process has forced many institutions in Indonesia to prematurely employ the LMS without considering the readiness of both educators and infrastructural provision.

It is obvious that educators play a significant role in succeeding educational reform towards technological use in universities (Howard & Mozejko, 2015), especially for the use of a new technology-based platform of LMS, the understanding of the way how it should be used and the familiarity of educators towards the system are crucial to succeed the adoption. Similarly, previous research has shown that two out of six important prerequisites to successfully apply a blended learning system which is based on LMS platforms are IT skills and pedagogical competence of educators (Ozkan & Koseler, 2009). Therefore, lecturers are required to have IT skills and pedagogical competence at the same time where they can experiment and develop their teaching practices by working with LMS platforms and incorporating a virtual and a face to face mode of learning in a course.

However, the Indonesian government has failed to equip members of universities particularly staff and lecturers with skills and understanding about the new system before the transformation. The policy and encouragement of the government to maximise technological resources, unfortunately, are not followed by visible and appropriate training for educators. Kuntoro and Al-Hawamdeh (2003) suggested that the vast majority of educators in Indonesian higher institutions, especially in the eastern part of Indonesia, are not familiar with the e-learning system. This is absolutely a crucial challenge where the government should ensure that lecturers and educators should be able to operate and employ the LMS platforms before releasing the new policy and rules. Lecturers and other staff should have been supported with training in order for them to be able to solve technical problems when using the LMS. Therefore, instead of having a radical change in the policy, long-term strategic approaches should be situated to make sure that the integration of LMS platforms in teaching and learning process run well. The continuous training and tight lecturers' recruitment procedure in an institution are two crucial points that need to be conducted and strengthened as the initial work before coming to the policy transformation (Arifin, 2017; Thompson 2016).

A further factor to consider as a huge problem regarding technicality is a shortage of technological infrastructure among all the universities in Indonesia to adopt LMS platform. Despite a large amount of money spent by the government to support higher educations in Indonesia to employ the LMS, the overall average of technological infrastructure in Indonesia is still low. According to Unwin et al. (2010) who evaluate the implementation of LMS in Africa, technological infrastructure is one of the biggest obstacles influencing the unsuccessful implementation of LMS platforms in many universities in African countries. Similarly, evidence is raised in Cambodia where the lack of the human resources and poor technological infrastructure among schools in the country have made it difficult to use e-learning system in

their educational practices (Richardson, 2008). The similar condition can be seen in Indonesian universities, particularly in rural areas in the eastern part of Indonesia where staff and educators do not employ the LMS because of the unavailability and the scarcity of technological resources in their institutions.

To conclude this section, the literature identifies two important components that have been systematically lacking in the introduction of LMS in Indonesian higher educations. Those two components are the lack of human resources in implementing the LMS and the scarcity of technological infrastructure to support the adoption. Therefore, the government should be encouraged to continually build the physical infrastructure as well as enhance the professional competence of lecturers, staff, and administrators across universities in using IT so that the LMS can be properly implemented.

#### **b. Organisational Challenges**

Having described the problems from technical perspectives, it is now important to discuss the obstacles of adopting the LMS platforms from the organisational issue in Indonesian Higher Education. For institutions to comprehensively implement the LMS platforms where lecturers can manage their teaching, transfer information, assess their students, and communicate through online platforms, policy makers in universities cannot just simply pay to use the system and introduce it to students. Watson and Watson (2007) argued that one of the primary challenges is to be able to make this platform understood by the whole community in institutions. Therefore, it is important to encourage not only lecturers and students but also all staff and members of institutions to be involved in the adoption of the system. However, for a developing country like Indonesia, introducing a new transformational platform to an institution is a difficult and complex process that requires time in order for it to be constructed and infused in an organisation.

The first challenge in an organisation to adopt a technology-based system is the lack of systemic procedure in implementing the system throughout an institution. It is suggested by Ozkan and Koseler (2009) that to implement the e-learning system of LMS; institutional environment should be managed, designed, and well organised where all university staff including administrative staff and lecturers comprehensively understand their work roles in the learning management system. It is important that the members of an institution are structurally working with the same objectives and culture using computational operation through LMS platforms. As a result, the synchronous system can be achieved where all parts of education including administrative works such as course instruction, student tracking, devices and tools

management, and technological maintenance can be handled by staff under the similar platforms of LMS instead of giving all responsibilities only to lecturers.

However, according to Quimno et al. (2013), the ideal condition as mentioned above is not what appear in educational institutions in many developing countries since most universities are simply integrating the system into their institutions without having a clear guidance on the way administrative and teaching staff should be managed. It should be noted that LMS platforms do not only deal with computers, technology, software, and hardware, but it is beyond that where lecturers and staff have to experience a new situation with different roles and responsibilities. Therefore, Unwin et al. (2010) suggested that training given to members of institutions does not merely to enable them to operate and run the LMS, but more importantly to get them involved and engaged with the new culture and roles in the integration process of LMS to teaching and learning practices in universities.

Another difficult challenge that might appear in the transformation of digital technology in teaching and learning process in a developing country is the aspect of awareness and attitude of university staff and lecturers towards the implementation of LMS platforms. It is suggested from literature that despite the encouragement of policy makers to adopt the new approach in conducting the educational practices, many lecturers and staff cannot transform their previous paradigm into the new manner of doing their work roles with the platform (Hannon, 2013). For example, in most universities, with the integrated platforms that have been provided by the university leaders, lecturers still teach in the same pedagogical approach that they are comfortable working with without putting their commitments to maximise the LMS to enhance teaching and learning.

Likewise, Unwin et al. (2010) indicated that despite the immense interest of teachers in Africa towards the use of LMS platforms, some looked at the platform only as advanced technology that requires a large amount of money and skills. Thus, they did not show a positive attitude to interpret the system as something that can deepen learner's learning and improve the depth understanding of students. As a result, integrating this LMS platform to the teaching practices becomes more challenging since many staff and lecturers, if not entire elements, of an organisation still maintain their culture, attitude, and old practices which are proven as big obstacle to adopt the system successfully. This case is supported by Bhuasiri et al. (2012) who argued that in pursuing a new system in an organisation, a transformation should be followed with a change of mindset of all members within an institution. Indeed, the effective implementation of LMS platform will not be achieved unless the revolution of thinking about technology exist among educators.

The third challenge in the transformation is the lack of involvement of university leaders in succeeding the LMS. According to Bhuasiri et al. (2012), the full and active involvement of university leaders and stakeholders is a key aspect in the development of the e-learning and LMS transformation to be implemented. University leaders should be responsible for understanding the existing system in order for them to mediate and provide the condition which is needed by all the staff and lecturers throughout institutions. Therefore, it is important for them to be competent and able to operate the system. Besides, university leaders have to have a capacity to recognise all the scopes of LMS implementation in education including its technicality, pedagogy, administration, and organisation so that they can easily promote the active roles of all members in the institution towards the transformation.

However, there are many gaps between ideal roles of institutional leaders and their actual work in the transformation. Unwin et al. (2010) suggested that many administrators seem not ready to lead the change where they made roles and policies without having a convincing plan and clear objectives to achieve in the use of the LMS system. It is important to note that leaders are the model of the entire staff in adopting a transformation. Once leaders accept and respond the transformation appropriately, the significant majority of groups will immediately accept and follow. Therefore, the commitment and responsibility of the administrators and university leaders at the institutional level are the most necessary features for successful adoption of LMS platforms.

In summary, it has been explained that there are three obstacles from the organisational issue that should be carefully evaluated before attempting to implement LMS platforms in higher institutions in Indonesia. Those obstacles are the lack of systemic procedure of an institution towards the LMS, the negative attitude and behaviour of institutional members on the transformation, and the absence of university leaders' contribution regarding organising and managing the new system. The section that follows moves on to consider the obstacles from the geographical and social issue.

### **c. Geographical and Social Challenges**

The section below will attempt to describe in greater detail the challenges and problems of implementing the LMS platform in Indonesia from two important points namely geographical and social issues. Firstly, it is apparent that Indonesia is endowed with remarkable geographical diversity consisted of thousands of islands. It makes a greater challenge in terms of practising equal education throughout the country including to adopt the LMS platform. Though the rules and the policy from the government obviously explain that teaching and learning at university level should be integrated with the use of technological devices to

enhance the educational practices, providing equal access to the involvement of every university towards the transformation has not been easy due to the tremendous disparity in terms of geographical condition. Jacob, Wang, Pelkowski, Karsidi, and Priyanto (2012) argued that with its geographical condition, Indonesia probably faces the most obstacles in terms of affording access and equity of educational practices in the higher educational environment. It is difficult and complex for the government to meet all the demands of universities that spread across many islands from the eastern part to the western part of Indonesia.

This condition is worsened with the developmental policy of the government where the expansion of infrastructural improvement and teachers' training is mainly focused in many universities in urban areas which caused unequal education among all the universities in the country (Rye, 2008). Similarly, Zuhairi, Wahyono, and Suratinah (2006) admitted that there is a huge gap in terms of facilities, infrastructural provision, and teachers' quality between university in urban areas and rural areas in Indonesia. In the big and populated cities like Jakarta, Surabaya, Malang, and Makassar, the use of technology in some universities like LMS platform is partly prosperous where more advanced facilities are provided by the government. In other rural regencies, however, the computer literacy of lecturers, students, and staff is low, and the access to internet connection and technological facilities are inadequate. As a result, the adoption of LMS platforms cannot be effectively implemented in all universities throughout the country.

The second problem appearing in the transformation of education towards technology and LMS is economic disparities among society in Indonesia. With the reform of the educational system, the demand of using technological devices obviously increase that automatically obliges students to have their own devices and computers to access their learning from their home. Unwin et al. (2010) argued that the access of students to the personal laptop in many developing countries, however, remains the main problem that needs to be taken into account before implementing the LMS platforms. The ultimate challenge from this notion is that not all students in Indonesia can afford to buy a laptop or technological device to deal with the LMS platform. Some students coming from low-income family must encounter the economical hurdle to catch up with the policy and to fulfil the requirement of having their own devices. It is found that Indonesia has experienced a significant lack of the ownership of computers and internet access where a study conducted in ten cities has shown that only 5 percent of Indonesians have a laptop or PC in their home (Unicef, 2011). This economic case is a challenging and ironic condition where the government have to deal with before successfully incorporating the LMS system in educational practices.

However, the government should be optimistic to look at the emerging trend of Indonesia with the digital world where it is suggested that by the rapid growth of social media, Indonesia is in the second-largest population on Facebook and third-largest on Twitter (Socialbakers, 2017). Despite the lack of infrastructural provision and economic rate compared to other countries, the internet and mobile usage has increased year by year in Indonesia which indicates that the implementation of LMS platforms basically has big potential to be adopted. Still, the social behaviour of society should be changed that they should be encouraged to access not only social media but also academic resources through online platforms.

#### **d. Recommendations**

All in all, in order for the government to be able to maximise the potential outcomes of the LMS usage and minimise the obstacles faced by universities in adopting the system, some recommendations are stated as follows:

Firstly, to make LMS practical throughout the country, it is crucial that technology can be accessible by all elements of education. Therefore, instead of focusing the infrastructural development merely in urban areas, the government should support the development of LMS by equally distributing the funding to build technological infrastructure and provide teachers' training in both rural and urban areas.

Secondly, affording a short-term training is not significant to enhance the development of all elements in using the LMS system. The impactful and meaningful outcomes can only be achieved if the training provided is consistent and regular. Therefore, it is essential to provide university leaders, lecturers, and staff with a gradual training and continual assistance during the implementation of LMS.

Thirdly, intensive monitoring for lecturers and staff throughout the institution should be conducted where lecturers and staff should be regularly evaluated by the government and experts where the development of their professional career pathway and their incentives will be based on their performance in doing their roles in the transformation.

Fourthly, it is important to strengthen the institutional organisation by encouraging the active involvement and joint effort among stakeholders, governments, and university leaders to make a mutual partnership in order for them to have the same vision and objectives regarding the transformation.

#### **Conclusion**

This paper attempts to examine the adoption of LMS platforms in higher education in Indonesia. It has explored the general context of higher education towards the use of technology

and LMS platforms. It can be argued that with the regulated policy from the government that has encouraged the use of technological features in teaching and learning practices, the present condition of LMS implementation in Indonesia still experiences various problems in terms of technical, organisational, and geographical and social issues. Therefore, it can be argued that the LMS adoption has not significantly transformed teaching and learning practices in Indonesian higher education.

Two major problems from the technical issue are the lack of expertise of Indonesian people on computers literacy and the hurdles on technological infrastructures. Furthermore, there are three challenges from the organisational issue that need to be enhanced namely the systemic and systematic procedure of institutions in implementing the system, the awareness and commitment of teachers and staff towards the transformation of LMS, and the active involvement of university leaders in promoting the system. Additionally, the government has to encounter a challenge due to the geographical and social condition of Indonesia to provide equal educational services to every city and university throughout the country as well as to change the social attitude of people regarding educational technology.

Fortunately, the statistic showing that Indonesian people actively engage with technological devices in social media platforms is an emerging signal that the academic platform of LMS is also possible to be well implemented in the country. However, the effective implementation of the system will not be achieved unless all the obstacles and challenges are solved. Thus, some recommendations are suggested in the previous part of this essay to solve the problems.

On the whole, the conclusions and the recommendations of this study about the implementation of LMS platforms in higher education in Indonesia are applicable and can be shared in global contexts, particularly with cases in the context of other developing countries. The central issues occurred related to the transformation of education using digital technology and LMS platforms are evidently typical such as the cases in Africa, Cambodia and other developing countries (Richardson, 2008; Unwin et al., 2010). Hence, the preceding recommendations can be taken into consideration as efforts for improvement in dealing with the educational transformation of using LMS in teaching and learning practices in higher education.

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## References

- Arifin, M. A. (2017). The teaching methodology and assessment of character education in Indonesian English curriculum: Teacher's perceptions. *Asian EFL Journal*, 20(5), 12-28.
- Asian OECD Development Bank (2015). *Education in Indonesia: Rising to the Challenge*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264230750-en>
- Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, 58(2), 843-855.
- Dougiamas, M., & Taylor, P. (2003). Moodle: Using learning communities to create an open source course management system.
- Hannon, J. (2013). Incommensurate practices: Sociomaterial entanglements of learning technology implementation. *Journal of Computer Assisted Learning*, 29(2), 168-178.
- Howard, S. K., & Mozejko, A. (2015). Teachers: Technology, change and resistance. *Teaching and digital technologies: Big issues and critical questions*, 307-317.
- Hussein, R., Aditiawarman, U., & Mohamed, N. (2007). *E-learning acceptance in a developing country: a case of the Indonesian Open University*. Paper presented at the German e-Science conference.
- Indonesian Ministry of Higher Education. (2011). Panduan penyelenggaraan model pembelajaran pendidikan jarak jauh di Perguruan Tinggi. Retrieved from <https://luk.staff.ugm.ac.id/atur/PanduanPJJ-2011.pdf>
- Jacob, W. J., Wang, Y., Pelkowski, T. L., Karsidi, R., & Priyanto, A. D. (2012). Higher Education Reform in Indonesia: University Governance and Autonomy. In H. G. Schuetze, W. Bruneau, & G. Grosjean (Eds.), *University Governance and Reform: Policy, Fads, and Experience in International Perspective* (pp. 225-240). New York: Palgrave Macmillan US.
- Kuntoro, R. D., & Al-Hawamdeh, S. (2003). E-learning in higher educational institutions in Indonesia. *Journal of Information & Knowledge Management*, 2(04), 361-374.
- Onwuegbuzie, A. J., Leach, N. J., & Collins, K. M. (2011). Innovative qualitative data collection techniques for conducting literature reviews/research syntheses. *The SAGE handbook of innovation in social research methods*. Sage, Thousand Oaks, 182-204.
- Ozkan, S., & Koseler, R. (2009). Multi-dimensional students' evaluation of e-learning systems in the higher education context: An empirical investigation. *Computers & Education*, 53(4), 1285-1296. doi:<https://doi.org/10.1016/j.compedu.2009.06.011>

- Quibria, M. G., Ahmed, S. N., Tschang, T., & Reyes-Macasaquit, M.-L. (2003). Digital divide: determinants and policies with special reference to Asia. *Journal of Asian Economics*, 13(6), 811-825. doi:[https://doi.org/10.1016/S1049-0078\(02\)00186-0](https://doi.org/10.1016/S1049-0078(02)00186-0)
- Quimno, V., Imran, A., & Turner, T. (2013). *Introducing a sociomaterial perspective to investigate e-learning for higher educational institutions in developing countries*. Paper presented at the 24th Australasian Conference on Information Systems (ACIS).
- Richardson, J. W. (2008). ICT in education reform in Cambodia: problems, politics, and policies impacting implementation. *Information Technologies & International Development*, 4(4), pp. 67-82.
- Rye, S. A. (2008). *Conditions of Connectivity: The Internet and the time-space of distance education in Indonesia*: Norges teknisk-naturvitenskapelige universitet, Fakultet for samfunnsvitenskap og teknologiledelse, Geografisk institutt.
- Selwyn, N. (2016). *Education and technology: Key issues and debates*: Bloomsbury Publishing.
- Socialbakers. (2017). In Facebook and Twitter Statistics by Country. Retrieved from <https://www.socialbakers.com/statistics/>
- Thompson, C. (2016). The magic of mentoring: a democratic approach to mentoring trainee teachers in post-compulsory education. *Research in Post-Compulsory Education*, 21(3), 246-259. doi: 10.1080/13596748.2016.1195172
- Unwin, T., Kleessen, B., Hollow, D., Williams, J. B., Oloo, L. M., Alwala, J., . . . Muianga, X. (2010). Digital learning management systems in Africa: myths and realities. *Open Learning: The Journal of Open, Distance and e-Learning*, 25(1), 5-23. doi:10.1080/02680510903482033
- Watson, W. R., & Watson, S. L. (2007). What are learning management systems, what are they not, and what should they become. *TechTrends*, 51(2), 29.
- Zuhairi, A., Wahyono, E., & Suratinah, S. (2006). The historical context, current development, and future challenges of distance education in Indonesia. *Quarterly Review of Distance Education*, 7(1), 95.