Empirical Article

OJED
OPEN JOURNALS IN EDUCATION

Volume 16, Issue 2 (2024), pp. 56-64
Journal of Comparative & International Higher Education
Online | https://ojed.org/jcihe

Digitalization of Higher Education in Vietnam

Le Thi Thanh Thu*

Ho Chi Minh City Open University, Vietnam

*Corresponding author: Le Thi Thanh Thu Email: thu.ltt@ou.edu.vn
Address: Ho Chi Minh City Open University, Ho Chi Minh City, Vietnam

This article was not written with the assistance of any Artificial Intelligence (AI) technology, including ChatGPT or other support technologies.

Abstract

This article presents a review of the current state and the potential of digitalization of Vietnam's higher education and makes recommendations in support of the digitalization process. It is mainly based on public documents. The paper discusses the extent of institutional digital transformation, its challenges, and opportunities in two contexts: (1) before the outbreak of COVID-19 when the process of digitalization of most universities was just beginning and varied in level, and (2) after the outbreak of COVID-19, when digitalization occurred rapidly. The review addresses digitalization in line with the National Digital Transformation Program with a vision for 2030, which has three targets: (1) to develop the platform to support distance learning and teaching and thoroughly apply digital technologies to management, teaching, and learning; (2) the development of digitalized learning materials, and (3) the creation of a data warehouse for sharing teaching and learning resources.

Keywords: digitalization, digital transformation, government policies, higher education, Vietnam

---

Tóm tắt

Bài viết trình bày tổng quan hiện trạng và tiềm năng số hóa giáo dục đại học Việt Nam và đưa ra các khuyến nghị hỗ trợ quá trình số hóa. Bài viết chủ yếu dựa vào các tài liệu đã công bố. Bài viết tập trung thảo luận về mức độ chuyển đổi số của các trường, với thách thức và cơ hội ở hai bối cảnh: (1) trước khi dịch Covid bùng phát khi quá trình số hóa của hầu hết các trường đại học mới bắt đầu và đa dạng về cấp độ, và (2) sau khi dịch Covid bùng phát, khi quá trình số hóa diễn ra nhanh chóng. Các phân tích tập trung vào các mục tiêu số hóa nêu tại Chương trình Chuyển đổi số quốc gia, định hướng đến năm 2030: (1) phát triển nền tảng hỗ trợ dạy và học từ xa và áp dụng triệt để công nghệ số trong công tác quản lý, giảng dạy và học tập; (2) số hóa tài liệu học tập và (3) xây dựng nền tảng chia sẻ tài nguyên dạy và học.

Từ khóa: số hóa, chuyển đổi số, giáo dục đại học, chính sách của Chính phủ, Việt Nam

Received April 8, 2023; revised June 1, 2023; accepted September 1, 2023

Introduction

This paper presents a snapshot of the current state and the potential of digitalization of Vietnamese higher education (HE) and proposes recommendations in support of the digitalization process in higher education institutions (HEI). Government policy has shaped and driven the digital transformation agenda. Before the COVID-19 outbreak, digitalization had been slow and varied among HEI. Some universities were actively engaged in the digital transformation of institutional processes and systems, while the majority had just embarked on digitalization. The COVID-19 pandemic has highlighted and accelerated digitalization in Vietnam, resulting in positive and rapid progress. The following section, an overview of higher education in Vietnam, addresses policy related to digitalization to better understand the previous and current performance. In conclusion, the paper presents some recommendations.

An Overview of Vietnamese Higher Education

The Vietnamese national education system (formal and non-formal) has four levels. Early childhood education, general education: primary education (5 years), lower-secondary education (4 years), upper-secondary education (3 years), vocational education, and higher education (HE). HE is the highest of the four levels and provides programs leading to Bachelor's, Master's, and Doctoral degrees (Government, 2016a). The Ministry of Education and Training (MOET) is responsible for the national education system, except for the three-year-program colleges and vocational training, which are under the responsibility of the Ministry of Labor, War Invalids and Social Affairs (National Assembly, 2019).

There are 237 universities (excluding those in the security and defense areas), with 172 public universities and 67 private universities (MOET, 2020a), including two national universities (Vietnam National University, Hanoi, and Vietnam National University, Ho Chi Minh City). However, only 119 HEIs are directly under the direct management of MOET, while the others belong to other governing agencies, including line ministries, local government, or foreign organizations (Japan International Cooperation Agency, 2022). The Prime Minister's Office directly manages the two National Universities which comprise several specialized universities. In general, these HEIs follow the guidelines and supervision of MOET for education-related activities, while their financial and general management are under the direct command of the respective governing agencies. Public HEIs are funded, maintained, and represented by the State, while private ones are financed and supported by domestic or foreign investors. HEIs are required to determine their development goals and operational orientation as research- or application-oriented.

Vietnamese HEI are relatively centralized, and regulation includes institutional management, curriculum design, enrolment, and program operation. The curricula designs follow the standards provided by MOET, which appear in several official documents such as Vietnam's National Qualification Framework (Government, 2016b), Education Law (National Assembly, 2019), and Higher Education Law (National Assembly, 2018). Standards and formulation, appraisal, and promulgation of HE programs appear in Ministry documents, including regulations concerning the admission and program operations of Bachelor, Master, and Doctoral levels (MOET, 2021a, d).

In 2018, a World Bank report on the educational innovations of East Asia and the Pacific (World Bank, 2018) ranked education in Vietnam in the Above-Average Performing Systems, with schools showing significant progress. This impressive record of success in education shows that quality schooling in resource-constrained contexts is possible. While Vietnam has made significant strides in advancing at all levels of education, particularly at the tertiary-level, issues such as digitalization remain. Before the COVID-19 outbreak, specific actions and strategies for the educational digitalization of most HEI were just the beginning (Nguyen, Pham & Nguyen, 2021). To date, digitalization has accelerated considerably.

Digitalization

Digitization is understood as using technologies and information to transform institutional operations (Iosad, 2020). Digitalization causes significant changes in how society operates. The widespread use of digital devices, increased connectivity, and the creation of large amounts of digital data are evidence of this change. Digitalization is profoundly influenced by public policy and institutional development strategies, both of which play a crucial role in shaping the digitalization landscape of higher education (Walker, Jenkins & Voce, 2016). HEIs apply digital technologies to optimize existing processes by allowing more efficient operation and coordination between the various operations. Digitalization also changes the ways of teaching and learning, and, more generally, of relations between academic staff and students. (Pagani

& Pardo, 2017). Hence, HEIs become more competitive with digitalization, which may enhance their stakeholders' experiences.

Digitalization is considered an inevitable trend in HE (Japan International Cooperation Agency, 2022). This trend forces HEIs to revolutionize their approach to operations in several ways, including digitalizing the management information system, creating a database system, and applying technology to manage, operate, forecast, and support educational decision-making more efficiently than in the past. Teaching, learning, and evaluating might involve digitized documents, digital libraries, and virtual laboratories, implementing online teaching and learning systems, and building virtual universities (Phung, 2021).

Current Digitalization Policy

Government policy has played a key role in accelerating HE digitalization. Vietnam policies promoting digital transformation in HE provide a solid foundation and focus for the pace and scope of digital transformation in universities. Before 2020, there were various initiatives, such as the "Scheme for developing Vietnamese digital knowledge system" (Government, 2017). Anyhow, the benchmarks for HE are the following (PricewaterhouseCoopers (PwC) Vietnam, 2021):

The National Digital Transformation Program by 2025, Vision to 2030

Vietnam adopted in 2020 the National Digital Transformation Program towards 2025, vision to 2030, referred to as the Program, (Government, 2020), setting dual goals: (1) holistically transform the nation on three pillars, digital government, digital economy, and digital society, and (2) establish digital technology companies that can be worldwide famous. The Program specifies education among the eight priority areas to promote social and digital transformation. HEIs are supposed to head to seven targets: (1) to provide human resources in information technology; (2) to supplement their programs with digital technologies such as artificial intelligence, data science, big data, cloud computing, Internet of Things, virtual reality/augmented reality, block chain, and 3D Printing; (3) to provide open mass online courses for all citizens to improve access to education through digital technology, training, retraining, and digital skills training; (4) to universalize online exams; (5) to recognize the value of online learning certificates; (6) to build the data warehouse for sharing teaching and learning resources, and (7) to develop technology serving individualized instruction and learning.

In detail, the first top priority in implementing the Program is to develop the platforms to support distance learning and teaching and thoroughly apply digital technologies to management, teaching, and learning. All HEIs are supposed to provide distance learning and teaching, in which piloting programs allow studying at least 20% of the program content online. Second, the materials need to be digitalized; third, the data warehouse for sharing teaching and learning resources, both face-to-face and online, needs to be constructed; and fourth, technology for education, towards individualized instruction and learning, requires to be developed.

Strengthening the Application of Information Technology and Digital Transformation in Education and Training in the Period of 2022-2025, Vision to 2030 Project

Further guiding the Government Program, known as the *Program* (Government, 2020) in the area of education, the Government presents the Strengthening of the application of information technology and digital transformation in education and training in the period between 2022 and 2025, vision to 2030 Project (Government, 2022). The overall aim is to encourage using technology to promote innovation in teaching and learning, to enhance the quality of and opportunities to access education, to strengthen education management efficiency, and to build an education system that is open and adaptable to digital platforms; all of which will contribute to the development of a digital government, digital economy, and digital society (Pitt, et al., 2022).

Towards 2025, the Project aims at two objectives with key performance indicators. The first is to drastically innovate the method of educational organization to make teaching and learning in the digital environment an essential and daily educational activity for every teacher and every learner. Specifically, regarding access to online education, 50% of students and teachers have the conditions (in terms of media, transmission lines, and software) to participate effectively in online teaching and learning activities. Regarding the online education environment, to establish online teaching and learning platforms that are domestic products used by over 50% of students. More than 50% of HEI offer online distance learning (degree) programs. Regarding the scale of online activities, the proportion of online classes accounts for 20%. As to students studying for a second university degree, at least 50% study online, with more than 50% of the time being online.

The second objective is to drastically innovate the method of management based on technology and databases, enhancing the management efficiency and service quality of the State and institutions. Regarding institutional management, all HEIs apply the digital platform for educational system management. The national database system of the education sector is established and operates efficiently. Vigorous application of online service provision should lead to paperless administrative procedures regarding student services.

The discussion of the digitalization of HE in Vietnam will be based mainly on the first three suggested targets mentioned in the Program, with which the Project objectives are in alignment. They are (1) the development of platforms to support distance learning and teaching and thoroughly apply digital technologies to management, teaching and learning; (2) the digitalization of materials and (3) the development of data warehouses for sharing teaching and learning resources both face to face and online. The fourth target, the development of educational technology for individualized instruction and learning, responds mainly to the second aim of the Program to build up international digital technology companies in the future, and as such, might not apply to the current context.

Digitalization of HE before the COVID-19 Outbreak

According to the British Council report (Pitt, et al., 2022) on the readiness of digital transformation in Vietnamese universities, Vietnam possesses favorable conditions for digitalization. The rapidly increasing scale of telecommunications services, computers, and ICT products in Vietnam shows the rapid development trend of the digital economy in the future. Vietnam's ability to connect to the Internet quickly and easily and willingness to switch from 3G to 4G is also an excellent advantage for the digital transformation with the highest mobile/fixed broadband subscribers in Southeast Asia. The transmission quality and the speed of mobile/fixed bandwidth in Vietnam are relatively uniform and higher than average in Southeast Asia, excluding Singapore (World Bank, 2019).

The Vietnam Digital Evolution Index in 2021 was 46.79, which was low in comparison with those of other Southeast Asian countries, such as Thailand (53.04), Malaysia (69.03), and Singapore (98.82) (Mruthyunjayappa, 2021). In terms of workforce digital skills, the nation dropped four spots to rank 96th in the 2020 Global Talent Competitiveness Index (PricewaterhousCoopers, 2021). According to a World Bank report on improving the performance of HE in Vietnam (World Bank, 2020), active engagement among HEIs is varied. A few universities were forging ahead and integrating digital technologies; the others, in general, lack the foundational infrastructure and ICT technology to take advantage of digital and/or disruptive technology to support innovative educational approaches in teaching and learning. The HE system in general is considered underfunded (Japanese International Cooperation Agency, 2022; World Bank, 2020). The digital infrastructure of private universities is often better funded and modern, such as Vinschool, FPT Education, and Phenikaa (Pitt, et al., 2022; Japanese International Cooperation Agency, 2022).

Another critical challenge for digitalization is that teachers and students lack digital skills (Le, Giang & Ho, 2021). In public HEIs, the older age group of staff generally adapts slowly to technological changes (World Bank, 2020). Also, there is fragmentation and inconsistency since HE is overseen not only by MOET alone but also by several other governing agencies (Heyden & Le-Nguyen, 2020). In addition, the inconsistency of multiple bylaws (World Bank, 2020) causes more complexity and fragmentation in the legal framework for managing public HEIs, all of which might impede fostering digitalization nationwide among all HEIs.

As to the first target, most HEIs developed a learning management system (LMS), which could be considered a popular solution to promote digital transformation. LMS is a web application with different functional modules to manage the teaching content and the learning process entirely online. Besides, the system also integrates services to support exchanging information between lecturers and students and among students, assigning tasks, and offline interaction (Tang & Nguyen, 2020). In addition, building an information management system with learners' educational records is also considered as a targeted benchmark of digital transformation. According to Phung's study of HEI top leaders (Phung, 2021), they knew that building such a data system could allow universities to use these tools to analyze the performance of faculty, students, and staff for effective HEI management. These implementations can support decision-making and improve teaching efficiency and student recruitment rate, creating competitive advantages (Phung, 2021). However, poor interaction occurs when students access LMS infrequently or inappropriately.

Establishing the platform to support distance learning and teaching was not quite popular among HEI. In Vietnam, distance or e-learning has appeared in universities since 2000, but not many HEIs had invested in it. Only the two Open Universities and those offering distance or e-learning degree programs explored online and blended learning and invested in infrastructure and data management systems (Le, Giang & Ho, 2021), while other HEIs were somewhat skeptical (Tang

& Nguyen, 2020). It was estimated that more than one-half of HEIs stayed away from distance teaching and learning (Pham & Ho, 2020). Though technology was thought of as meeting the growing demand for higher education at a reasonable cost, online learning is much more expensive and complex if it is to be done correctly. Lacking established pedagogic traditions and expertise in this area, online teaching cannot be developed cheaply and quickly without sacrificing quality (Rizvi, 2020). Until late 2021, there had been separate delivery modes, as required by MOET. Full-time or regular programs had to operate face to face, while distance education relied on online courses, largely asynchronous, using LMS. E-learning was still minimal for regular or full-time programs (Pham & Ho, 2020) and was used only as a form of support.

As to targets number 2 and number 3, HEIs' operations are limited. Due to the limited provision of e-learning, most universities could not sufficiently provide open learning resources to learners and lecturers. Few HEIs, such as Ha Noi and HCMC Open University, Ha Noi and HCMC University of Technology, Can Tho, Da Nang, and Thai Nguyen University, have been providing online materials and assignments in delivering their full-time programs (Le, Giang & Ho, 2021). Building a digital data warehouse (e-books, electronic libraries, multiple-choice question banks, essays, etc.), e-learning, e-learning software, and simulation application software were considered not a spontaneous development, as they need large budgets and a long-time, specific, and synchronous plan. That is why not all HEIs implement the plan (Phung, 2021).

Current Context and toward the Future

The COVID-19 pandemic has led to a massive increase in online teaching through various digital technologies and platforms (Felix, 2021) and a growing appreciation for the merit of e-learning and related technology-based educational modalities (Pham & Ho, 2021). Fully aware of the necessity of digitalization, together with the top-down policy, such as the Program (Government, 2020), and the Project (Government, 2022), MOET and HEIs have firmly embarked on the digitalization processes at the national and institutional levels. Consequently, digitalization in Vietnam is moving forward steadily.

Most of the HEIs are approaching the first target. HEIs have developed a platform to support distance learning and teaching and thoroughly applied digital technologies to management, teaching, and learning (ICTVietnam, 2020). However, the level of digitalization varies among HEIs. The following might count the potentiality of the speeding digitalization processes. In 2021, MOET amended the regulations that officially allow HEI to provide up to 30% online teaching and learning volume of the regular/full-time Bachelor programs (MOET, 2021a, d), 20% online volume of the joint Master and Ph.D. programs (MOET, 2020b), and online testing up to 50% of course assessment, which is a crucial step forward for all HEIs to apply e-learning widely in their programs. MOET has released guidance to promote digital transformation in regulations on management, operation, and use of the national database system, interconnection data standards, and others. In addition, public HEIs have invested in the LMS considerably as they received various kinds of support from government, donors, and technology enterprises during COVID-19 (Japan International Cooperation Agency, 2022). All these have pushed forward HEIs efforts in their digitalization.

E-learning has become popular with Vietnamese students. Blended teaching and learning, a combination of on-campus lectures and online learning, has become popular. Many have confirmed the transition of teaching materials and after-class discussions onto the digital platform to improve the learning experience for their students. Most HEI support LMS to help teachers collaborate with students, manage their learning progress, and share the lecture content (Japan International Cooperation Agency, 2022). LMS also helps provide paperless procedures to students. Students can enroll in the new courses, check their study records, pay tuition fees, or do other administrative procedures without coming to offices in the institution.

HEI management tasks, such as students' academic records, teachers' workload, and administration such as staff workload, infrastructure inventory, salary payment, etc, have also been gradually integrated into the digital system (Japan International Cooperation Agency, 2022). The fact that HEIs have applied various tools such as web portals or academic and research management platforms for some time and currently have added new ones might raise the concern of synchronous databases, such as duplication or harnessing data, during the digitalization process of HEIs in the future.

In addition, the national database systems of the education sector also operate nationwide, and MOET has asked all institutions to use the MOET portal, a statistical system for the purpose of national-wide information on HE, (MOET, 2020c). A recent unified higher education management information system (HEMIS) promotes evidence-based decisions from all stakeholders. A shared database for 63 Departments of Education and Training of Vietnam, 710 Departments of Education and Training, and about 53,000 educational institutions has data about 53,000 schools, 1.4 million students, including statistics, and reports on the whole education system. It has helped managers at all levels issue effective

management policies. This system can also support 63 Departments of Education and Training and more than 300 universities and colleges nationwide for entrance selection and enrolment (Pitt, et al., 2022).

The second target of having the library and reference material database has received more focus and substantial results. The more e-learning is provided, the more HEIs prepare themselves for the operation's requirements, including digitalized materials. The HEIs which have embarked on providing online courses are more advanced, such as Ha Noi National University, University of Foreign Trade, and University of Commerce (Nhat Hong, 2022), while the newly joined HEIs are accelerating even though they confront challenges such as allocating large budgets, time-consuming preparations, and copyrights for the materials. Moreover, digital learning materials (e-books, e-libraries, multiple choice question banks, e-lectures, e-learning software, and simulation application software) do not develop spontaneously, orderly, and systematically. It is therefore difficult to control their quality and content (ICTVietnam, 2020).

The third target of having a platform for sharing face-to-face and online teaching and learning resources has been developed at the HEI level. Most HEIs offer online learning as part of their full-time programs. Especially at the national level, national database systems have also been built up and are used nationwide, such as the E-learning warehouse, and the Vietnamese Knowledge Systems (MOET, 2020c).

Under the supervision of MOET, the digital data warehouse has contributed to the Vietnamese Knowledge System, which digitizes nearly 5,000 quality e-learning electronic lectures, a repository of doctoral theses with about 7,000 theses, a multiple-choice question bank with over 31,000 questions, 200 e-books, and more is added. In addition, there are massive data warehouses of private companies in use, such as those of Viettel (Viettelstudy), VNPT (vnEdu), MISA (Misa EMIS), Topica, FPT (VioEdu), VTC Intercom (IOE), as reported by the Ministry of Information and Communication (MIC, 2021).

Moreover, several HEIs are building MOOCs to build a data foundation and to disseminate knowledge in socio-economic fields and in science and technology to create conditions for the community to contribute, share and exploit, which will contribute to the lifelong learning. Also, HCMC Open University is co-operating with Hanoi Open University to develop further VMOOCs with more than 50 free courses in fields such as business administration, finance-banking, law, foreign languages, and others (Vietnamnews, 2021).

Recommendations

The digitalization in Vietnamese HEIs has been accelerated after COVID-19. The future of HEIs practice will be shaped by more integrated digital technologies. Students need to integrate e-learning to function well in the digital age (Pham & Ho, 2020). HEIs with more digital components are predicted to achieve a more competitive teaching quality and enrolment advantage. The following recommendations further support for digitalization of HE could be considered.

Support for Policy Dissemination

Government policy only provides a top-down driver for change. How individual institutions implement them will vary, as each institution has its own systems, processes, educators, and learners to consider. To enable HEIs to effectively undertake their digital transformation and provide practical support for policy implementation, MOET should provide clearly articulated guidance, criteria, and evaluation frameworks (Pitt, et al., 2022). MOET should coordinate and regularly promote national-level training, webinars, and other nationwide promotion activities to increase familiarity with policies and effectively disseminate policies and supporting resources related to digital transformation policy.

Government Support to HEIs

MOET and the governing ministries need to increase investment and support for universities. Recognition of the concerns and challenges for HEIs, such as the issue of cost, standardized systems, and infrastructure, are vital to ensure that HEIs feel fully supported in digitalization. The government should allocate special funding for digitalization projects in HEIs, especially in provinces, to support the implementation of new technologies and infrastructure, by establishing digital infrastructure such as high-speed Internet, hardware and software systems, and cybersecurity measures to ensure delivery of online courses. In addition, MOET should partner with private companies, research institutions, and international organizations to support digitalization initiatives in developing new technologies and innovative solutions for HEIs. MOET also should support and encourage research on good practices in HEI digitalization to disseminate nationwide.

Changing the mindset of HEIs leaders should also be considered a top priority. MOET should provide training to top-level institutional leaders to understand the benefits of digital transformation and the scope and requirements of digital

transformation to develop their digital literacy and knowledge of advanced digital technology applied in education. Those leaders afterward will confidently involve and support the digitalization process at their HEIs.

HEIs Support for Lecturers

HEIs should support the development of digital skills among HEI lecturers and students through training programs and capacity-building initiatives. Further training and support for lecturers are needed in the following five main areas:

(1) Intellectual property awareness: in particular, training should prioritize the new critical areas in digitalization, such as copyright, intellectual property, cyber security, and privacy, that lecturers might confront.

(2) Pedagogical practice: for the pedagogical practice, the training provides lecturers with the knowledge and skill for effective online teaching, classroom management, and student inclusion. How to apply digital tools such as discussion forums, virtual group projects, and online quizzes needs to be included to help lecturers foster student engagement, and collaboration with their peers.

(3) Digital skills: digital skill training empowers lecturers with their digital skills, such as how to prepare for their online teaching material, how to use tools to create digital lessons, to record and edit the recordings suitable for the class; to create engaging visual content; to use multimedia tools to create interactive, aesthetic and understandable presentations for learners, and to use tools to create online quizzes and contests (Do, 2021).

(4) Training on developing personalized learning models: students learning varies in their objectives, tempo, and styles. The training should specify how to apply technology to developing personalized learning models which better suit individual student needs and abilities (Nguyen, Pham & Nguyen, 2021).

(5) Digital mentorship to senior lecturers: senior lecturers' needs extensive training to acquire the digital skills, and the HEI should provide an essential support team Unit in the universities handy for senior lecturers to increase their confidence, digital technologies knowledge, and, ultimately, their digitalization involvement.

HEIs Support for Students

Further training and support for students are needed because thus far most HEIs have invested mainly in digital infrastructure, digital data platforms for HEI operation, and management, including teaching and learning. Investments should also focus on developing online services for students.

(1) Digital skill training: HEIs should provide comprehensive training for students, including web search skills, to ensure learners can maximize online learning opportunities. Students also need mastery to use digital tools for effective study engagement and study in collaboration with their lecturers and classmates.

(2) Paperless administration procedures: automatic consults and feedback might be given to students related to their administration requests and the potential students' enrolment requests. Students can register for all the thesis writing, submission processes, course enrolment, program and course change, tuition paid, tuition waived, or scholarship application online (Le, 2022).

Conclusion

In conclusion, the current teaching and learning context after COVID-19 has reinforced the comprehensive roadway to digitalization in Vietnamese HE. The Government and HEIs have responsively committed themselves to the digitalization processes at the national and institutional levels, even though the digitalization processes vary among HEIs. HEIs have constructed their own platform to support distance learning and teaching, and thoroughly apply digital technologies to management, teaching, and learning. An increasing number of HEIs have embarked on developing digitalized learning materials, and data warehouse for sharing teaching and learning resources.

References

Do, V. H. (2021). Digital skills for training, teaching, and learning. In D. Briesen, & Q. M. Pham (Eds.) *Vietnam as digital society*. (pp. 65-74). Thanh Nien Publishing.

Felix, J. J. (2021). Higher education in times of instability and disruption: rethinking notions of values, value creation and instructional practices in Vietnam and beyond. *Frontiers in Communication, 6* (647471). https://doi.org/10.3389/fcomm.2021.647471

Government (2022). *Decision no. 131/QD-TTg, dated 25/1/2022, Promulgating the Project strengthening the application of information technology and digital transformation in education and training in the period of 2022-2025, vision to 2030*.

Government (2020). *Decision no. 749/QĐ-TTg, dated 3/6/2020, Promulgating the national digital transformation program by 2025, vision to 2030*.

Government (2017). *Decision No. 677/QD-TTg, dated May 18, 2017, Promulgating the scheme for developing Vietnamese digital knowledge system*.

Government (2016a). *Decision 1981/QD-TTg, dated 18/10/2016, Approving the Structural framework of the national education system*.

Government (2016b). *Decision 1982/QD-TTg, dated 18/10/2016, Approving the Vietnamese qualifications framework*.

Hayden M., Le-Nguyen D.C. (2020). A review of the reform agenda for higher education in Vietnam. In L. H. Phan &, B. N. Doan (Eds.), *Higher Education in Market-Oriented Socialist Vietnam*. (pp. 21-40). USA: Palgrave Macmillan. https://doi.org/10.1007/978-3-030-46912-2

ICTVietnam (2020). *Digitalization in higher education: Solutions to promoting technology and communication deployment at tertiary level*. Retrieved from https://ictvietnam.vn/chuyen-doi-so-trong-giao-duc-dai-hoc-giai-phap-tang-cuong-ung-dung-cntt-trong-cac-co-so-dao-tao-dai-hoc- 2020080516242389.htm.

Iosad, A. (2020) *Digital at the core: A 2030 strategy framework for university leaders*. Retrieved from https://repository.jisc.ac.uk/8133/1/2030-strategy-framework-for-university-leaders.pdf

Japan International Cooperation Agency (JICA) (2022). *The data collection survey and situation analysis on industrial human resource development in Vietnam.* Retrieved from https://www.jica.go.jp/vietnam/english/office/others/c8h0vm00008ze15n-att/ihrd_report_en.pdf

Le, D. L., Giang, T. V. & Ho, D. K. (2021). The impact of the COVID-19 pandemics on online learning in higher education: A Vietnamese case. *European Journal of Educational Research, 10*(4), 1683-1695. https://doi.org/10.12973/eu-jer.10.4.1683

Le, L. (2022). *Education institutions ramp up digital infrastructure*. Retrieved from https://vir.com.vn/education-institutions-ramp-up-digital-infrastructure-93835.html

Ministry of Information and Communication (MIC - 2021). *Chuyển đổi số trong giáo dục đào tạo: Một số giải pháp phát triển học liệu số (Digital transformation in education: Some solutions to develop digital learning materials)*. Retrieved from https://namdinh.gov.vn/portal/Pages/2021-10-5/Chuyen-doi-so-trong-giao-duc-dao-tao-Mot-so-giai-pmm3dli.aspx

MOET (2021a). *Circular 08/2021/TT-BGDDT, dated March 18, 2021, Promulgating regulations on undergraduate education*.

MOET (2021b). *Circular 17/2021/TT-BGDDT, dated June 22, 2021, Providing standards and formulation, appraisal and promulgation of training programs of higher education*.

MOET (2021c). *Circular 18/2021/TT-BGDDT, dated June 28, 2021, Promulgating regulations for admission and Doctoral education*.

MOET (2021d). *Circular 23/2021/TT-BGDDT dated August 30, 2021, Promulgating regulations for admission and Master education*.

MOET (2020a). *Higher education statistics*.

MOET (2020b). *Circular 38/2020/TT-BGDDT, dated October 6, 2020, providing Regulations on joint training with foreign partners at Bachelor's, 'Master's and 'Doctor's levels in the form of online and blended training*.

MOET (2020c). *Dispatch No. 4003/BGDĐT-CNTT, dated 7/10/2020, on ICT Guiding of the school year 2020 –2021*.

Mruthyunjayappa, R. (2021). *Impact of Digitalization for Higher Education in Vietnam*. Retrieved from https://er.educause.edu/articles/2021/6/the-impact-of-digitalization-for-higher-education-in-vietnam.

National Assembly (2018). *Higher education law no. 34/2018/QH14, dated 19/11/2018*.

National Assembly (2019). *Education law no. 43/2019/QH14, dated 14/6/2019*.

Nguyen, M. T., Pham, D. H. & Nguyen, T. D. (2021). Impact of the industrial revolution 4.0 on higher education in Vietnam: challenges and opportunities. *Linguistics and Culture Review, 5*(S3), 1-15. https://doi.org/10.37028/lingcure.v5nS3.1350

Nhat Hong, 2022. *Chuyển đổi số trong giáo dục không chỉ là đổi mới phương thức cập nhật thiết bị, công nghệ mà nó còn là vấn đề văn hóa và con người (Digitalization is not only the issue of renovating the technology, but also the issue of culture and human beings).* Retrieved from https://daibieunhandan.vn/giao-duc--y-te1/chuyendoi-so-trong-giao-duc-dai-hoc-nhieu-tro-ngai-va-thach-thuc-i303256/

Pagani, M. & Pardo, C. (2017). The impact of digital technology on relationships in a business network. *Industrial Marketing Management (67)*, 185-192.

Pham, H. H., & Ho, T. T. H. (2020). Toward a 'new 'normal' with e-learning in Vietnamese higher education during the post COVID-19 pandemic. *Higher Education Research & Development, 39*(7), 1327–1331. https://doi.org/10.1080/07294360.2020.1823945

Phung, T. V. (2021). *Digital transformation at universities: Global trends and 'Vietnam's chances*. Atlantis Press. https://doi:10.2991/aebmr.k.211119.008

Pitt, B., Huynh, T. Q., Gregson, J., Seal, T., Tran, H. H., Nguyen, H. T., Bui, T. N. T., & Nguyen, H. M. (2022). *Readiness of digital transformation in Vietnamese universities*. British Council. https://www.britishcouncil.vn/en/education/going-global-partnerships/success-stories/report-readiness-digitaltransformation-vietnamese-universities

PricewaterhouseCoopers (PwC) (March 2021). Vietnam's survey on technology, jobs and skills. *Vietnam Digital Readiness Report*. Retrieved from https://www.pwc.com/vn/en/publications/2021/pwc-vietnam-digital-readinessreport-en.pdf

Rizvi, F. (2020). Challenges facing Vietnamese higher education. In L. H. Phan &, B. N. Doan (Eds.). *Higher education in market-oriented socialist Vietnam,* (pp. 379-388). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-46912-2

Tang, M. S. & Nguyen, T. H. (2020). Digital transformation trend in Vietnam higher education: Blended learning model. *International Journal of Social Science and Economics Invention,* 6(7), 304-399. https://doi.org/10.23958/ijssei/vol06-i07/218

Vietnamnews (2021, January 21). *Universities offer free online courses for everyone*. Retrieved from Universities offer free online courses for everyone (vietnamnews.vn)

Walker, R., Jenkins, M., & Voce, J. (2016). The rhetoric and reality of technology-enhanced learning developments in UK higher education: reflections on recent UCISA research findings (2012–2016). *Interactive Learning Environments (26),* 858 – 868.

World Bank. (2020). *Improving the performance of higher education in Vietnam: Strategic priorities and policy options*. World Bank, Washington, DC.

World Bank. (2019). *The digital economy in Southeast Asia: Strengthening the foundation for future growth*. World Bank, Washington, DC.

World Bank. (2018). *Growing smarter. Learning and equitable development in East Asia and Pacific*. World Bank, Washington, DC

LE THI THANH THU, Ed.D. She obtained her M.Ed., and Ed.D. at La Trobe University, Australia. She has worked as an administrator at the Office of Academic Affairs, and Graduate School of Ho Chi Minh City Open University for more than 25 years. Her main research interests are distance and online learning, and teacher development.
Email: thu.ltt@ou.edu.vn.