THE 4.0 SMART UNIVERSITY MODEL - DEVELOPMENT TREND OF PRIVATE UNIVERSITIES IN THE CURRENT CONTEXT

Ngo Quang Son[1]
Vu Thi Thanh Minh[2]
Duong Thi Thao[3]

[1]Trung Vuong University
[2]Thanh Do University
[3]Binh Phuoc Department of Education and Training
Email: *Ngoquangson2018@gmail.com*[1]*; vttminh@thanhdouni.edu.vn*[2]*; dxduongthao@gmail.com*[3].

Received: 11/3/2024 Reviewed: 13/3/2024
Revised: 18/3/2024 Accepted: 26/3/2024

DOI: *https://doi.org/10.58902/tcnckhpt.v3i1.127*

Abstract:

Facing with opportunities and challenges regarding the need to train high-quality human resources by 2025 with a vision to 2030, under the impact of the fourth industrial revolution, private universities must create a breakthrough in improving training quality to meet national digital transformation. The 4.0 smart private university aims to provide students with core 21st century skills. The authors of this article have outlined the basic nature and main characteristics of smart private universities 4.0, the principles for developing smart private universities and then propose a system of measures to build a 4.0 smart private university based on the principles and ensuring the basic characteristics of a private university in the 4.0 era.

Keywords: *Fourth industrial revolution; Digital transformation; Education 4.0; ICTs; Smart Private University 4.0.*

1. Introduction

Smart education is a new trend in world education. In order to build a smart nation, many countries have aimed to build smart education to train generations of smart citizens. As an advanced university model, smart private universities will create opportunities and conditions for schools to enhance adaptive capacity and balanced development in the face of rapid changes in society in general; Students of private universities can explore and create knowledge, develop autonomy and adaptability and creative thinking through individualized pedagogical instructions, suitable to their characteristics and needs, personal needs; Increase the importance, reliability, usefulness and flexibility of curriculum content. The application of smart technology for university education has reshaped the educational landscape by transforming the content and methods of receiving/delivering learning as well as the way of guiding, supporting, organizing, university management.

With those opportunities and challenges, private universities need to make a leap to improve the quality of training high-quality human resources in the context of national digital transformation. The basic characteristics and principles of building smart private universities built on the information and communications

technology application model will serve as the basis for feasible solutions to help educational institutions. Education develops into a 4.0 private university.

2. Research overview

In 2018, the Education Commission in New York introduced 7 criteria for smart universities, including: Providing and expanding online learning; Use technology to personalize learning; High-speed, broadband university connection and technology applications; Connect the classroom with open sources outside the school. Lecturers apply technology to teaching and continuous professional development; Focus on developing STEM skills for learners; Smart leadership and management based on technology foundation and technological capabilities.

In Malaysia, since 2015, the Smart University project has been implemented. Smart universities in Malaysia have 4 main platforms: Flexible curriculum, helping students develop comprehensively; Flexible teaching methods, combining many approaches in teaching and learning, help students discover knowledge and develop sustainably; Learning materials promote cognitive abilities and create motivation through a combination of technology, instructors and open learning materials.

In Vietnam, the elements of the smart school model appeared not long ago and are still quite new, so information about related research in Vietnam is still very scattered.

Research by Dr. Nguyen Ngoc Trang and Dr. Nguyen Lan Phuong (Institute of Interdisciplinary Social Sciences - Nguyen Tat Thanh University) (2022) has clarified the contents of online teaching (Online), Smart Education, Smart University with theoretical and practical significance to improve adaptive capacity. response and quality of university education.

Teaching online

Online teaching (also known as Online teaching, E-learning) is a method of teaching through electronic devices connected to the network (such as desktop computers, laptops, tablets, smartphones,…) to a server elsewhere. On the server, electronic lectures and necessary software are stored to be able to ask/request/give questions to learners participating in remote online learning. Teachers can transmit images and sounds via broadband or wireless connections (WiFi, WiMAX), local area network (LAN). From there, learners will absorb the lesson quickly and class time becomes more attractive and lively. Online teaching and learning is a form of online training that is more innovative than traditional teaching and learning.

Smart education

Smart education is a new trend of modern education. In order to build a smart nation, many countries have aimed to build smart education to train generations of smart citizens, promoting the smart university model to meet the requirements of social construction.

Tikhomirov envisions Smart Education (2018) as "the overall modernization of all training processes", Smart Education must be implemented in a new university model in which Information and Communication Technology (ICT) in collaboration with specialized faculties will create a completely new quality in the process and results of training, research, business and other activities of a university.

Meanwhile, IBM defines Smart Education (2017) as "a multidisciplinary, learner-centered education system". This system connects universities and vocational training institutions, using: (1) Compatible learning programs for learners; (2) Integrated technologies and learning resources for both learners and teachers; (3) Computerize administration, monitoring and reporting to maintain classroom teachers; (4) Information about learners is collected more accurately and completely and (5) Smart university.

When considering the origin of Smart University 4.0, international studies often mention the requirements for transforming the school model as a necessary factor for school education to keep up with the latest changes of the information era, science and technology, meeting the requirements of citizen training for the new era, the era of the 4.0 industrial revolution. The

birth of the Internet and its increasingly widespread application, the rapid development of science and technology, the trend of globalization and integration in general have changed all aspects of social life. Smart education helps change the approach to the university model in the direction that the university is not only a place of training and research but also a center of innovation, solving practical problems, bringing value, treat society.

Scholars also consider building a smart private university model as one of the inevitable trends, meeting the development of education in general and higher education in particular in the context of educational innovation and new ways of teaching 4th industrial network; Develop a comprehensive strategy to build smart private universities in Vietnam.

Based on the MOOCs (Massive Open Online Courses) platform, the 4.0 smart university model with the effectiveness it brings will have the opportunity to contribute to building the country's higher education. The current smart private university model has not yet been determined although many studies and discussions are taking place in the world and in Vietnam.

Professor Vuong Thanh Son (University of British Columbia, Vancouver, Canada), an international scientific researcher in the field of IoT (2019), calls this model the ICH model (Internetworking, Computing tools, Humans). While in traditional universities, teachers play a central role, in smart universities 4.0, that role is transferred to learners. In the age of Internet connection, with the goal that learners can learn anytime, anywhere, without limitations in time or space. Instructors and students can meet in the classroom and can also meet online. Students can work together, discuss directly with teachers or discuss online.

Some advantages of Smart University 4.0 according to Marian's research (2015):

- Use the data collected by others to achieve various useful applications. Specifically, students learn in an open and airy environment, so they have the opportunity to easily access diverse and global sources of knowledge.

- Create an environment conducive to increased socialization among all members of the university community. With the development of IoT, connections are created not only between students, students and teachers, but also between universities, creating a comprehensively developed learning ecosystem.

- Easily achieve inventory of technology and equipment. This is important in improving the quality of learning and participation of students at universities.

Smart university is an advanced school model aimed at training smart citizens to meet the requirements of building a smart learning society, aiming to develop a smart nation. *Smart university 4.0* is an advanced university system built and developed based on modern technology, satisfying 4.0 education criteria such as: artificial intelligence application; connecting all things through the Internet; share huge sources of information and data; Control and management by automatic devices. *Smart university 4.0* is considered a university model implementing smart education associated with modernizing facilities and making the most of technology towards a high quality education. Smart university 4.0 will be formed and managed based on 3 platforms: Smart university overall management system, Electronic library system, smart library and Smart Elearning online training system.

Dr. Bui Quang Hung - Vice Rector of the University of Economics Ho Chi Minh City (UEH) shared: "The concept of smart university actually has many approaches. From the perspective of what schools are doing and researching, the concept of smart university is generalized as a higher education institution oriented towards digital transformation and using digital infrastructure, digital human resources, digital data and digital technology to provide personalized learning services for learners of all generations, meeting the requirements of lifelong learning and sustainable development. This is a very important idea in the goal of making a smart university. Or to put it more simply, "smart" is innovative solutions to solve problems and

challenges that universities pose during their operations, for sustainable development of that university. One thing to note is that in a smart university, technology is a tool to help solve problems, not the application of technology that is smart. Innovative solutions that solve university challenges are called smart."

To evaluate the intelligence level of a 4.0 smart university, Dr. Nguyen Huu Duc and colleagues (2020) also proposed the intelligence levels of a 4.0 smart university including 5 levels: Connection - collection Receive and connect information, Conversion - information conversion and digitization, Cyber - analysis and diagnosis, Cognition - identification and prediction, Configuration - optimization.

Level 1 - Information acquisition and connection (Connection): School systems have the ability to collect information and connect stakeholders in learning-related issues such as learning environment, Teaching methods, learning objects, and lecturers' teaching style, these systems can be customized to adapt to different devices such as computers, tablets, phones or other operating systems same as iOS and Android.

Level 2 - Ability to convert information and digitize (Conversion): From the information collected and managed at level 1, systems in level 2 have the ability to connect them together and present statistical results.

Level 3 - Analysis and diagnosis (Cyber): From the analysis results at level 2, systems in this level 3 have the ability to analyze, make diagnoses and learn from the results. That result to perfect the system.

Level 4 - Identification and prediction (Cognition): After obtaining analysis results from level 3, the system at level 4 will use these results to predict possible outcomes. and come up with solutions.

Level 5 - Optimization (Configuration): smart university has the ability to intentionally change its internal structure, optimize and maintain itself. For example, the system automatically identifies systems, parameters, sensors, and features in a smart classroom appropriate to the subject, classroom characteristics, and instructor as sensors determine whether whether students are in the classroom or not, whether the lights are on...and adjust accordingly, the system automatically redefines the system, hardware, software and features in a suitable smart classroom.

In short**,** the concept of a smart university is generalized as a higher education institution oriented towards digital transformation and using digital infrastructure, digital human resources, digital data and digital technology to provide personalized learning services for learners of all generations, meeting the needs of lifelong learning and sustainable development. In a smart university, technology is just a tool to help solve problems, not that the application of technology is smart. Only by providing a system of innovative solutions, promoting startups and solving the challenges of traditional universities can it be called a 4.0 smart university. To date, the 4.0 smart private university model has not been determined. Scholars have considered building the 4.0 smart private university model to be an inevitable trend, meeting the development of education in general and higher education in particular in the context of educational innovation and 4th industry revolution. There needs to be a comprehensive strategy to build traditional private universities into 4.0 smart private universities in Vietnam. This is truly an important and urgent issue in the current context of national digital transformation.

3. Research methods

- Theoretical research methods group: research documents of the Ministry of Education and Training on developing the smart university model, research a number of scientific topics, textbooks, books...on smart education, smart university model 4.0, private university model, smart private university model 4.0

- Practical research method group: Expert method, Operational product research method

4. Research results

4.1. Characteristics of smart private universities 4.0 in the context of national digital transformation

The quality of student learning is improved

Smart private university 4.0 operates on the basis of applying information and communications technologies (ICTs) in management, organization of vocational education activities and at the same time building a compatible learning environment. Collaboration in cyberspace of school, family and society with students as the focus. Smart classrooms include smart interactive boards, smart training devices and flexible, mobile and smart teaching activities that expand the boundaries of learning due to unlimited numbers. Smart education allows learning anywhere and anytime, thereby giving students and lecturers the freedom to choose topics and develop self-reliance and creative thinking for students. Smart private university 4.0 aims to invest in human resource development, providing students with core skills of the 21st century, which are:

- Technology and media
- Learning and creativity skills
- Creativity and innovation
- Critical thinking and problem solving
- Communication and collaboration
- Life and career skills

Management of smart private university 4.0 is lean and effective

Information systems that manage the technical infrastructure and services of smart private universities 4.0 will be digitized, interconnected and share data between sectors; Increase learner participation to improve the capacity and management effectiveness of smart private universities 4.0. On the other hand, the system is integrated with global education, applying online learning platforms and learning on mobile devices anywhere; At the same time, the application of the learner management model also follows a modern method. Large databases (Big Data) are connected to evaluate output results.

Effective learning environment

With an online monitoring and warning system about the built environment and information technology applications, it will support the timely and effective resolution of issues of concern to learners, improving the satisfaction of all learners. People. Interactive learning environment with learning content from around the world with the aim of making the learning process more effective in a 4.0 technology application environment. Virtual reality technology (VRT) helps students feel the simulated space realistically thanks to 3 - dimensional viewing glasses (virtual reality glasses). Lecturers apply simulation software, practice software and virtual experiments in teaching; Students test and take exams directly on the computer...

Fast and convenient public service

Ensure public services quickly and conveniently. Accordingly, the contents prioritized by Smart Private University 4.0 are: Smart management tools; Smart classroom 4.0, online classroom; Software for teaching, reviewing, evaluating, and taking online exams; Self-study software for lecturers and students; Smart learning resource center 4.0, electronic library.

Improve competitiveness

Building a secure digital information infrastructure, encouraging the provision of open data to promote innovative start-up activities, helping businesses reduce costs and expand business cooperation opportunities in the digital economy .

4.2. Lessons learned for Vietnam to deploy the 4.0 smart private university model in the context of national digital transformation

Vietnam has many opportunities to deploy the 4.0 smart private university model and online teaching. Difficulties in the transition from the normal traditional private university model to the 4.0 smart private university model with challenges in applying modern technology are inevitable in this situation. current reality in Vietnam. From research on smart private universities 4.0 and successful practices of converting and developing smart private university models 4.0 in some countries around the world, some useful lessons will help. The orientation for Vietnam is:

Develop a strategy to develop the 4.0 smart private university model in Vietnam.

The 4.0 smart private university development strategy is an important basis to orient the education system and the community to actively pay attention to this model. That is the basis for financial investment and preparation of necessary pedagogical conditions for a 4.0 smart private university. From there, unify the will, beliefs, orientation and promote behavior for managers, teachers, learners and the community towards the smart private university model 4.0. Research on smart private universities 4.0 in terms of theory and practice needs to be invested and deployed to properly determine the nature, characteristics and requirements to develop smart private universities 4.0. Research and analysis of the current private university model, identify the gap between Vietnam's conditions and qualifications compared to the requirements and characteristics of smart private universities 4.0 and then find Find feasible paths and implementation methods for Vietnam.

Building and designing smart curriculum 4.0

- In order to create a 4.0 smart interactive environment for learners, 4.0 smart private universities need a smart curriculum that is highly combinatorial, flexible and open. The program content meets the requirements of providing basic knowledge and developing learners' capacity to meet the requirements of workers in modern society in the context of extensive application of modern technology.

- Carefully prepare the teaching team to meet the requirements of a 4.0 smart private university

- A smart teaching team is the decisive factor for the success of a 4.0 smart private university. The issue of training and developing teaching staff to meet the requirements of smart private universities 4.0 is inevitably raised. Conducting training, fostering and developing teacher capacity in many successive stages takes into account characteristics of teacher qualifications, traditional culture...It is necessary to evaluate the current situation of teachers in terms of quantity and quality according to teaching standards and criteria in smart private universities 4.0; Determine the needs and methods of training and fostering teaching staff appropriate to Vietnam's current circumstances. To teach effectively in a smart classroom, instructors need to: have strong expertise, have modern pedagogical capabilities and have technological capabilities to use and coordinate smart devices in teaching and learning.

- Developing leadership and management of smart private universities 4.0

- School leaders and managers have an important role in inspiring, implementing vision sharing and leading and supporting school members to transition from traditional pedagogy to smart pedagogy. Implementing school model transformation requires school leaders and managers to recognize and use the "power of technology" to improve learners' learning efficiency; and “use time, finances and staff more effectively”. Besides, it is necessary to clarify the personality model of leaders and managers of smart private universities 4.0; Create a plan that specifically identifies goals and specific roadmaps for training and fostering leadership and management of smart private universities 4.0.

- Leaders and managers of smart private universities 4.0 need to develop a system of capabilities such as: (1) Capacity to plan university development strategic according to the stages of the smart private university model 4.0; (2) Leadership and management capacity for teachers to access resources for continuous professional development; (3) Ability to connect and create relationships between members and organizations inside and outside the university; (4) Ability to support and advise teachers and university officials; (5) Ability to adapt and use modern technology in school management and leadership; (6) Capacity to effectively mobilize resources to develop smart private universities 4.0; (7) Ability to analyze and solve problems, promptly resolve difficulties that arise in university operations; (8) Ability to share and create motivation to participate in smart pedagogical activities for university members. University leaders and managers need to have proper awareness and develop appropriate self-

training plans.

- Investing in 4.0 smart technology facilities and equipment

- These are important conditions that affect the implementation of smart pedagogical activities, affecting the quality and effectiveness of teaching for teachers and learners, as well as the management of universities. Investment in facilities and smart technology equipment to serve the university's smart pedagogical activities needs to be researched, planned investment activities, identified and selected investment items to ensure ensure the elements of synchronization, quality, efficiency and sustainability.

- Develop policies to support the development of smart private universities 4.0

- Policies to support the development of smart private universities 4.0 are useful for the process of transformation, maintenance and sustainable development of elements of smart private universities 4.0. The transition to a 4.0 smart private university is a process of preparing human, material and financial resources to meet new requirements.

- In the current period of rapid technological development, education is one of the highly competitive businesses. To adapt to the 4.0 industrial revolution, universities have been adjusting their operating strategies to survive. Smart private university 4.0 was born as an alternative to traditional universities. With Smart Private University 4.0, technology becomes an important tool for learning, research, academic service and other related tasks, at the same time, accumulating and undergoing restructuring. Becoming a 4.0 Smart Private University is considered an inevitable process that private universities will have to go through in the future.

At universities in Vietnam today, the application of information and communications technology in particular and 4.0 technologies in particular is still limited and not synchronous. Therefore, the transition from traditional private universities to smart private universities 4.0 is still in the early stages. Building and developing a strategy to serve the process of promoting change towards Smart Private University 4.0 is an urgent but still open issue, although these issues are receiving much attention. Evaluating the current status of implementing existing Smart University 4.0 components at the University of Economics Ho Chi Minh City - UEH according to the V-SMARTH model (Nguyen Huu Duc et al., 2020), UEH is classified in A group of universities that are ready to be smart in the transition from traditional universities to Smart Universities 4.0 through a large proportion of lecturers and managers participating in the digital transformation process, partly activities have been standardized, few have been quantified. UEH's experience and implementation practices were shared in detail by Dr. Bui Quang Hung - Vice Rector of UEH: It can be said that digital transformation at Ho Chi Minh City University of Economics has been implemented for a very long time, early, more than 10 years ago. Up to now, the university has more than 60 applications in all activities from teaching, research and administration of the university as well as digital transformation campaigns to serve the community. Prioritizing the next 5 years, the University will also follow the components of smart university 4.0. That is to develop a sustainable digital technology platform; The second is the development of digital media; Third is to enhance the learning environment experience at Smart University; Fourth is upgrading digital support in management, teaching and learning; Fifth is to promote scientific research management towards technology application, digital transformation and AI; Finally, develop community relationships. During the 2019-2021 period, the university has had activities to support high schools in implementing digital transformation in teaching and learning in the context of COVID-19.

It can be seen that smart university 4.0 is the destination for sustainable development and innovation in higher education in the context of the 4.0 industrial revolution. From the experience of implementation at his unit, according to Dr. Bui Quang Hung, he proposed a number of

solutions towards smart university 4.0 in Vietnam:

Firstly, from the perspective of management agencies, we talk a lot about smart universities. There are no sets of indicators or templates for a smart university.

Second, as we know, in digital transformation there is technology application. Funding for this is an investment, not an annual expenditure. Therefore it requires a huge budget.

Third, in my opinion very important, is the role of human resources, especially the leadership team and managers in implementing digital transformation. Especially the role of senior leaders in inspiring, sharing vision, leading as well as supporting school members in implementing digital transformation.

Fourth, it is necessary to have a digital transformation strategy and plan. It is important to emphasize that we must have the right approach from the beginning so as not to waste time in the approach process and in investing funds.

Fifth, internal communication work is also very important, because it determines the awareness, initiative and consensus of the entire staff to accept and agree to be ready for changes related to the business.

Sixth, along with the digital transformation process, the university must build and apply a modern university governance model.

Finally, related to digital transformation is related to security and risks, related to the process of applying information technology, ensuring information security. This is also an issue that universities need to pay attention to when converting digitally. Thus, accumulating and undergoing restructuring to become a 4.0 smart university is considered an inevitable process that universities will have to go through in the future. Currently, there are many opportunities to develop smart universities 4.0 in Vietnam such as the timely and correct direction of the State towards the digital transformation of higher education institutions and human resources in the country.

4.3. Measure system for building smart private universities 4.0 in the context of national digital transformation

Through the overall picture of smart private universities 4.0 in the process of digital transformation in the field of education and training and ICTs application model, the article proposes solutions to build smart private universities 4.0 in the context of national digital transformation as follows:

4.3.1.Group of measures 1:

Raise awareness about the importance of digital transformation in education for each lecturer and university administrator and work together to build digital culture in education. Training and fostering a team of managers and lecturers with digital technology and information security capabilities necessary to operate in the digital environment, meeting the requirements of digital transformation, applying digital technology to management, teaching and learning activities: developing a platform to support distance teaching and learning towards individualized training; digitize documents, textbooks and build a platform to share teaching resources. Developing technology for education. 100% of private universities deploy remote teaching and learning, testing online training programs with at least 20% of the program content. Besides the same components as traditional private universities, smart private universities 4.0 have main specific components. Building a model of the basic elements of a 4.0 smart private university includes:

- Digital Resources are a basic element of smart private universities 4.0 and online teaching and learning. Digital resources refer to the use of digital textbooks with many superior features compared to traditional textbooks and electronic textbooks (e-textbooks), such as being able to directly monitor and manage the process. learning processes and outcomes, assessment and testing; Allows connection to external learning resources. In particular, teachers and learners can both develop this digital resource.

- Open education content is an important feature to realize the mission of smart private universities 4.0 of flexible and personalized

training. Open education content includes: Open learning materials; open information, MOOCs online lectures, open training programs and mobile content... In addition, digital resources also refer to connecting with resources between other private universities and cultural sharing as a criterion to evaluate the quality and effectiveness of digital resources.

- Virtual educational environment: is an environment that allows combining teaching and assessment activities on an online platform with many different classroom models (general classes, special classes, integrated classes and creative experiential classroom) with many different teaching and learning methods (problem-based teaching-learning, project-based teaching-learning, discussion, interdisciplinary integration, teaching-learning through experience) and many other utilities such as virtual laboratories, virtual libraries and virtual learning devices. In addition, the virtual educational environment also provides online monitoring, testing and assessment to help assess learners more flexibly and comprehensively.

- Personal learning needs: strengthen the flexibility of the education system and build customized learning programs linked to personal interests and future career orientation. Teaching and learning can follow a fixed schedule with many forms (online or face-to-face) or an individual-oriented program depending on interests, needs, and abilities.

- Highly Interactive educational environment: refers to learning and teaching through an interactive web platform. This interaction includes interaction between learners and teachers, interaction between learners and interaction between learners and digital resources. Such learning can take place anywhere with full content. This interaction promotes sharing and a culture of sharing but also brings downsides related to issues of copyright, intellectual property, ethics and academic integrity.

Digital infrastructure: refers to ensuring digital legal infrastructure, digital human resources infrastructure, digital data infrastructure and digital technology infrastructure for the development of smart private universities 4.0.

4.3.2. G*roup of measures 2:*

With the popularity of MOOCs, our country's universities need to consider making their curriculum truly flexible and accessible. We can learn how to integrate MOOCs with traditional education methods. The way to develop traditional private universities in the new context is that in addition to using existing platform systems such as edX or Coursera, private universities can design and build smart tools, including smart card-based university management and student care, artificial intelligence software, individual local cloud tools.

In particular, it is possible to localize the content repository and learning materials, and with international links to test new, open and airy training and learning methods that are suitable for the current situation and culture of Vietnam. To have can bring MOOCs closer to learners, with the benefits of efficiency and cost reduction, the role of traditional universities in the 4.0 revolution is very important, that is, it can help accredit the quality of universities.

It is not that in this revolution, traditional universities will be lost and replaced by online universities, but there needs to be a combination to comprehensively train learners, as well as care for them and create motivation. Therefore, depending on the characteristics of each university, another solution is to cooperate between universities and MOOCs distribution units to create opportunities to combine and develop training within universities. Traditional learning and online training in the new technology era. Applying IoT to further develop MOOCs can help develop higher education. The goal of the university model in the new era, innovation, especially entrepreneurial thinking in the new educational ecosystem, universities can have a solution to establish a company for open application. and more flexible.

Not only changing the model in universities but also the connection between university to

provide students with the best learning environment and experiences. This does not just stop at training links but must have a real connection between training programs, teaching staff, infrastructure, laboratories...

Smart private university 4.0 creates an interactive platform between learners and teachers as well as with vivid and intuitive learning resources. In addition to online courses under the MOOCs model, which are growing strongly and proving their effectiveness, currently large companies and corporations around the world have been building online learning platforms. That platform has the ability to create interactive virtual classrooms in an effective and intuitive way like Oracle Academy or Amazon Web Services providing cloud-based services that create the foundation for online education systems. can only form.

4.3.3. *Group of measures 3:*

Assess the current status of ICTs infrastructure, results of ICTs application at all levels of facility management, identify relevant parties and mechanisms to promote effective participation of many parties , paying special attention to student participation, thereby determining the leadership's vision of building a smart school. Building an ICTs application model, modernizing ICTs infrastructure to serve management and administration: Building a data management and operation center in schools; Invest in equipment, management information systems and databases; Invest in simulation equipment systems, virtual reality and modern teaching equipment. Building an ICTs application model in universities ensures the following characteristics of smart buildings: (1) Easy to deploy; (2) Increase energy efficiency; (3) Operate classrooms, workshops...more optimally; (4) Increase working efficiency thanks to the energy conditioning system. Deploy the STEAM education model and skills in using digital technology, ensuring network safety and security. In addition, STEAM is a global development trend connecting Science - Technology - Engineering - Art and Mathematics to create smart products that can replace humans in some jobs, for example Chatboxes, robots, etc. can be used in education to replace teachers at some stages. Adjust and supplement training programs on basic digital technologies such as artificial intelligence, big data, cloud computing and the Internet of Things.

4.3.4. Group of measures 4

Promoting scientific research activities, innovation in training and training management, digital technology solutions and cooperation with businesses. Focus on training digital skills linked to the market and meeting the requirements of national digital transformation. Strengthen international cooperation in scientific research and academic exchange; training and fostering teachers and administrators; school administration...at the same time attracting and creating conditions for foreign investors and experts to participate in training. Perfecting the legal system and application of management software: perfecting the policy and legal system plays an important role in educational management as well as ensuring the rights of students and trainees.

5. Discussion

The 4.0 industrial revolution has been taking place on a global scale, strongly impacting all aspects of social life, including the field of education, so the university education environment - the cradle of human resource training, human resources serving industry 4.0 - there needs to be moves in building the 4.0 education model. Facing that requirement, private universities in our country are tending to develop to become 4.0 smart private universities in the direction of innovation, creativity, entrepreneurship and sustainable development. The 4.0 smart private university model is the trend of a new education system. Grasping that trend, private universities need to organize research and discussions on: "Teaching and management towards smart private universities 4.0". These will be regularly organized activities to disseminate and equip lecturers of private universities about the 4.0 smart private university model, teaching and management activities in the model. At the same time, share experiences and discuss teaching and management solutions at

private universities towards smart private universities 4.0. To build and develop a key university towards a smart university with the core foundation being the 4.0 management system, three important factors need to be met: (1) Internet connection; (2) Applying smart computing tools such as hardware and software to support university administration, teaching, management and the training process; (3) There is a human element involved in the operation process. Private universities need to pay close attention to the 4.0 revolution and provide strategic directions for private universities to gradually move towards smart private universities 4.0. Accordingly, private universities need to consider and reevaluate their training philosophy; Promote investment in information technology infrastructure. International advanced programs need to add new subjects and majors that are necessary for learners. The core is to train human resources who are always able to adapt to new things. Next, in addition to updating existing programs, we need to continue to build new and interdisciplinary training programs, for example: Financial Law, Fintech, Information Technology in the Health Field, Information Technology in the Banking Sector, Network Security.... requires faculties of private universities to have more connection. In addition, personalization is an inevitable trend, so in the long run, training programs need to be personalized, or in other words, students can design their own training programs with advice from training units and systems. The role of lecturers has also changed, we are not only teachers but also motivators, leaders and inspirers by participating in projects and solving situations with students. The challenge is that the teaching staff needs to have practical knowledge, not just textbook knowledge. This type of online training needs to be born. We need to build student support services: electronic payment portal, online public service transaction portal, job information portal,...

Every journey of a thousand miles begins with the first small steps. Oriented to become a 4.0 smart private university, in 2024 private universities will take specific steps such as: piloting smart offices, building smart labs and smart lecture halls.

Private universities need to have a more comprehensive and in-depth view of the 4.0 smart private university model with its opportunities and challenges, to have the right awareness, and unite to innovate. Let's share and accompany on the journey to gradually build private universities into smart private universities 4.0.

6. Conclusion

The 4.0 industrial revolution has brought to Vietnam's higher education system (including both public and private universities) many opportunities and challenges, including the role of private higher education institutions. Mastery has changed from providing general knowledge to providing personalized learning in a flexible way related to each student's level and ability. Through the panorama of industry and human resource needs by 2025, it shows the importance of digital transformation in education, requiring smart private universities 4.0, which is (1) Academic quality of learners is enhanced; (2) Streamlined University Management; (3) Effective learning environment (4) Fast and convenient public services; (5) Enhance the university's competitiveness. Implementing the groups of measures proposed above will help private higher education institutions develop into smart private universities 4.0, creating a breakthrough in improving the quality of training and providing human resources. High-quality workforce meets the requirements of smart cities, contributing to accelerating the national digital transformation process.

Smart private university 4.0 is a university model consistent with the trend of modern education, a university model that adapts to the strong development in all aspects of social life and meets the requirements of education modern.

The need to train smart citizens to build a smart and start-up nation. Converting from a normal private university to a 4.0 smart private university is a careful preparation process and needs to be carried out synchronously. This process must go

through many stages corresponding to investments in infrastructure, qualifications of management staff, qualifications of teaching staff, social awareness and socio-economic circumstances of each individual. local. Lessons learned through studying the transition process of some countries are suggestions and reference materials for developing smart private universities 4.0 in Vietnam in the context of national digital transformation.

References

Anh, T. (2018). *Innovate to meet education 4.0*. Retrived March 1 2023 from https://www.vnu.edu.vn/ttsk/?C1654/N21806/doi-moi-de-dap-ung-nen- Giao-duc-4.0.htm.

Bakken, J. P., Uskok, V. L., Penumatsa, A. & Doddapaneni, A. (2016). Smart Universities, Smart Classrooms and Students with Disabilities. *Smart Education and E-learning 2016*, (15-27).

Coccoli, M., Guerico, A., Maresca, P. & Colleen, H. & Uskov, V. L. (2018). In chapter 2, Smart Innovation, Systems and Technologies. *Smart Innovation, Systems and Technologies*. UK: Springer International Publishing AG.

Government (2017). Directive No. 16/CT-TTg of the Prime Minister dated May 4, 2017 *on strengthening the capacity to take advantage of the 4th industrial revolution*.

Government (2020). Decision No. 749/QD-TTg issued on June 3, 2020 *approving the National Digital Transformation Program until 2025, with a vision to 2030*.

IBM. (2018). *Smart Education*. Retrieved 5 March 2024 from https://www.ibm.com/smarterplanet/global/file/au_en_uk_cities/ibm_smarter_education_now.pdf

Long, T. V., Huong, N. T. T. & Anh, N. T. N. (2018). *Overview of smart education and smart universities*. University of Transport.

Stanganelli, P. (2014). Smarter University: A vision for the fast changing digital era. *Journal of Visual Languages & Computing*, *25*, 1003-1011.

S-U-F.org. (2018). *What is a Smart University*. Retrieved 1 March 2024 from: https://www.youtube.com/watch?v=Km_XrO_zwYE.

Tikhomirov, V. & Dneprovskaya. (2015). *Development of strategies for smart universities*. Open Education Global International Conference, Banff, Canada. April 22-24. Norway: Open Praxis.

MÔ HÌNH TRƯỜNG ĐẠI HỌC THÔNG MINH 4.0 - XU THẾ PHÁT TRIỂN CỦA CÁC TRƯỜNG ĐẠI HỌC TƯ THỤC, TRONG BỐI CẢNH HIỆN NAY

Ngô Quang Sơn[1]
Vũ Thị Thanh Minh[2]
Dương Thị Thảo[3]

[1]Trường Đại học Trưng Vương
[2]Trường Đại học Thành Đô
[3]Sở Giáo dục và Đào tạo tỉnh Bình Phước
Email: *Ngoquangson2018@gmail.com*[1]*; vttminh@thanhdouni.edu.vn*[2]*; dxduongthao@gmail.com*[3].

Ngày nhận bài: 11/3/2024 Ngày phản biện: 13/3/2024
Ngày tác giả sửa: 18/3/2024 Ngày duyệt đăng: 26/3/2024

DOI: *https://doi.org/10.58902/tcnckhpt.v3i1.127*

Tóm tắt:

Trước thời cơ và thách thức về nhu cầu cần đào tạo nguồn nhân lực chất lượng cao đến năm 2025 tầm nhìn đến năm 2030, dưới tác động của cuộc cách mạng công nghiệp lần thứ tư, các trường đại học tư thục phải tạo bước đột phá trong việc nâng cao chất lượng đào tạo, đáp ứng chuyển đổi số quốc gia. Trường đại học tư thục thông minh 4.0 nhằm cung cấp cho sinh viên những kỹ năng cốt lõi đáp ứng yêu cầu của thế kỷ XXI. Nhóm tác giả của bài viết này đã nêu bản chất cơ bản của trường đại học tư thục thông minh 4.0, những nguyên tắc để phát triển trường đại học tư thục thông minh, những đặc trưng chủ yếu của trường đại học tư thục thông minh 4.0 và đề xuất hệ thống các giải pháp nhằm xây dựng trường đại học tư thục thông minh 4.0 dựa trên các nguyên tắc và đảm bảo các đặc trưng cơ bản của trường đại học tư thục trong thời đại 4.0.

Từ khóa: *Cách mạng công nghiệp lần thứ tư; Chuyển đổi số; Giáo dục 4.0; ICTs; Trường Đại học tư thục thông minh 4.0.*