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Higher Education – Digital Transformation: Strategies and Solutions to Developing Human Resources With Skills and Talents in 4.0 Industrial Revolution – Theory and Orientation

Review paper

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Abstract

The tendency of digital transformation has been apparent in almost all aspects of socio-economic life, of which tertiary education never stands an exception. Tertiary education holds the proper transformation strategies and orientations and catches up with the general trend, contributing to the development of the digital society and forming a digital nation in the future, which all require strategic and flexible solutions from the present time. The article analyzes some basic contents of digital transformation in higher education, factors guaranteeing successful digital transformation, assesses the current situation, and surveys regional, international, and domestic universities as well as the results and remainings, thereby proposing several strategies and theoretically oriented solutions to meet the requirements of developing skilled and talented human resources in the context of the Industrial Revolution 4.0 of Vietnam in the coming period.

Keywords**:** *4.0 Industry, digital transformation, higher education, human resources, international integration*

Problem Statement

Mankind has been stepping into an era that is different from previous ones in terms of level, structure, and logic of development. Under the Industrial Revolution 4.0, "the future is not on the stretch of the past", therefore, with a new mindset, a novel approach, and a "non-traditional, non-sequential" breakthrough, the latecomers may reach a far step forward that quickly catches up with developed countries. A nation paying much attention to developing skilled human resources, a core talent team rapidly adapting to the situation, knowing how to make full use of advanced technology, and constantly innovating to handle both national and global problems, would hold the superiority in this fierce competition.

In line with the development tendency of the 4.0 Industrial Revolution, Vietnamese higher education shapes its human resources by containing both merits and drawbacks, which are reciprocal and primarily depend on the tackling way. It is of undeniability that

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Vietnam encompasses a combination of non-ubiquitous advantages including all the time, location, and human factors. The population of nearly 100 million is currently in its golden population period with 70% under 35, accompanied by the already-advantageously geographical position, and further fuels its value in the rising Asian century. Our human resources also have bright and favorable qualities for successful digital transformation such as good capacity, studiousity, quick comprehension, good improvisation, and adaptability. In particular, history burgeons a wealthy and precious source of overseas Vietnamese wisdom.

Besides, the breakthrough advancement of digital technology and the innovation of business models in the Industrial Revolution 4.0 set an end to many skills in which various jobs may turn into extinction and be replaced by new careers requiring new skills. Hence, holding a good profession depends more on lifelong learning, constantly improving skills, and quickly developing new skills than initially trained expertise. Skills are important luggage for employees since those with good skills, offering value to society, would gain success and adequate results.

Being aware of the Industrial Revolution 4.0, Vietnam has issued important resolutions and policies to bolster digital transformation, typically, Resolution No. 52-NQ/TW (The Government, 2014; The Politburo, 2019) and Decision No. 749/QD-TTg (The Prime Minister, 2020). Those are extremely correct guidelines and policies, is the manual for the digital transformation in our country today. In this policy roadmap, it is necessary to do novel research for formulating strategies and designing specific and practical policies to solve two challenging human resource problems. First, quickly approach the 4.0 revolution, and equip the right skills for the majority of human resources ready for digital transformation. Second, develop a core team of talents to lead the digital transformation for the country to make breakthrough and powerful developments in the era of Industrial Revolution 4.0.

Concepts, Contents and Conditions for Digital Transformation in Smart Higher Education

Concepts of Digital Transformation

There exist diverse definitions of digital transformation. According to Garner, it is conceptualized as an application of technology to change business models, create more opportunities and new values, help businesses achieve better sales, and increase growth. According to Microsoft, digital transformation is the restructuring of thinking about the coordination of data, processes, and people to create new values.

Digital transformation can be defined succinctly as "a process of the total and comprehensive shift of individuals and organizations in the way of living, working, and production methods in the digital environment with digital technologies". The essence of digital transformation is the transition from the traditional way of living and working into one with both digital versions of entities and their connection in the digital space.

The digital transformation process is well coupled with the Industrial Revolution 4.0; in which digital transformation is the core of the given Revolution, AI is the key technology to deploy digital transformation. It can be viewed at three levels: Digitization, digital opportunity exploitation or process digitization, organizational digitization, and digital transformation with a creative nature (Creation).

Role and Benefits of Digital Transformation for Smart Higher Education

In the field of tertiary education, digital transformation will support innovation in education and training in the direction of developing learners' capacity, increasing learners autonomy, creating learning opportunities regardless of time and space, as well as personalizing learning in contribution to forming a learning society, lifelong learning and minimizing learning costs. The blooming of technology platforms IoT, Big Data, AI, SMAC (social network - mobile - big data analysis - cloud computing) has been carving the digital education infrastructure. Accordingly, many smart educational models

are being developed based on information technology (IT) applications, effectively supporting learning personalization.

- Enhancing the education quality

These days, technological achievements such as IoT (Internet of Things) help strengthen management and supervision in educational institutions and monitoring of learners' behavior; Big Data helps analyze learners' behavior for appropriate support and advice; or Blockchain helps build a system to manage information and education records of learners, allowing to consolidate, manage and share data among schools, record learning history, transcripts to ensure information is consistent and transparent.

- Fostering interactivity, practicality – application

Application of Virtual Reality (VR), and augmented reality (AR) in education to create virtual laboratories, VR models Virtual reality with the ability to interact with users or AR books, Blippar software with image recognition platform and leading visual browser help learners have multi-sensory experiences, easy to understand and remember and arouse curiosity as well as interest, while increasing interactivity, practice, and knowledge application within the classroom (The Prime Minister, 2017b).

- Creating flexible learning space and time, promoting open-equal, - personalized education

Recently, Massive Open Online Courses (MOOC) have been blooming with several major brands in the world such as Udacity, Coursera, edX, Udemy, and FutureLearn, which better facilitates learners to acquire knowledge flexibly and conveniently regardless of time and space. This promotes an open education, and open learning resources, helps learners access multi-dimensional information as well as abates spaces, and utilizes time-saving.

- Mitigating training costs

With the development of the internet and online teaching models, e-learning teaching enables the reduction of training costs. Accordingly, the tuition fee would be noticeably diminished: Training institutions save costs for equipment and facilities, and expenses for lecturers and experts; learners save on tuition fees, living expenses, and study materials.

- Better operation of training institutions

The application of technology in organization and management helps to manage lecturers and students, also manage programs and teaching plans with higher comprehensiveness, reduce the load of wastage, as well as increase the efficiency and working performance of the office and training blocks.

- Assessment (student knowledge and progress assessment)

Using student assessments combined with data analysis, lecturers can apply the information for modification of teaching plans. Whereby, students can answer the lecturer's questions via software, from which the lecturer can accurately assess the knowledge of each student.

Contents of Digital Transformation

Digital transformation in higher education is implemented under three main forms: Application of technology in teaching methods (smart classrooms, programming in teaching); technology application in management (operation tools, educational and training management); technology application in classrooms (teaching tools, facilities). Digital transformation in education and training focuses on two main contents: educational management and teaching, learning, testing, assessment, and scientific research.

- Contents of educational management include digitizing management information, creating large interconnected database systems, deploying online public services, and applying 4.0 Technologies (AI, blockchain, data analysis) in order to administer, operate, forecast, and support decision-making in a quick and precise manner.

- Contents of teaching, learning, testing, and evaluation include digital materials (e-textbooks, digital lectures, e-learning lecture database, multiple-choice question bank), digital libraries, virtual laboratories, deploying an online training system, and establishing cyber universities (cyber universities).

Conditions for Successful Digital Transformation

- It is in need of proper propaganda, and consistent and unanimous awareness in each organization and individual. Digital transformation should be perceived as an inevitable trend taking place rapidly, so it requires preparation, and adequate investment, as well as creating resonance and high determination.
- Mechanisms, policies, and laws should be consolidated for perfection, creating a favorable legal framework for digital transformation in higher education.
- The IT infrastructure and basic facilities must be synchronously equipped to ensure smooth, stable teaching and learning as well as information security.
- Human resources (managers, teachers, lecturers, pupils, and students) should be equipped with knowledge and skills to meet the requirements of digital transformation, foremostly IT skills, capacity in information security, and in exploiting and effectively using applications for teaching and learning.

Status, Opportunities, Challenges for Vietnam Tertiary Education.
Current Situation Of Digital Transformation in Education and Training

In education and training, IT application is one of nine core task groups to effectively implement Resolution No. 29 of the Party Central Committee on fundamental and comprehensive reform of education and training. The Prime Minister has also issued a project to strengthen the application of IT in educational management, to support teaching and learning innovation, and to conduct scientific research in the whole branch. A series of policies to bolster digital transformation in education were issued and they have gradually completed the legal framework, such as regulations on IT application in management, online training, university-level distance training regulations, principles on management, operation, and use of database system in education, IT application models in high schools, connection data standards; annual guidelines for IT tasks for universities and high schools and numerous other executive directive documents (The Prime Minister, 2017a). In 2021, due to the pandemic, the Ministry of Education and Training released a wealth of documents directly related to online training during the COVID-19 period, over 70% of higher education institutions deployed an electronic library system and an inter-connected e-learning system, sharing learning materials with other counterparts in order to improve training and research capacity. The electronic administrative management system connecting 63 Departments of Education and Training and over 300 universities and colleges nationwide with the Ministry of Education and Training operates smoothly and stably, which brings the system into full play and attains positive effects. Educational institutions have contributed to the Vietnamese Knowledge System by digitizing nearly 5,000 qualified electronic lectures, a repository of doctoral theses with nearly 7,000 theses, and a multiple-choice question bank with over 31,000 questions, contributing to building a learning society and promoting lifelong learning (Ministry of Education and Training, 2021).

Furthermore, a number of other policies have come into force, namely the implementation of new general education programs: i) Informatics will officially become mandatory for students from grade 3, which allows students to access tremendous advanced knowledge and skills from both domestic and overseas. The Ministry of Education and Training pertains to a belief that the near future will encompass generations of global citizens with high competitiveness; ii) Teaching is integrated with Steam technology, which enables students to handle arduous math problems as well as explore life phenomena most intuitively; iii) For digital transformation in higher education, universities/research institutes have expanded opportunities to cooperate with businesses and deploy teaching activities associated with the demand for human resources from businesses. Thereby, schools/institutes will promptly grasp information, update knowledge, adjust content and programs, and anticipate new professions under the trend of shifting economic and production structures in line with the development of social life (Ministry of Education and Training, 2022). Within the scope of the study, the author investigates the general development trend of 20 leading higher education institutions in the region, the world, and Vietnam.

This is a crucial reference to selecting the most appropriate model for the development. Accordingly, the given leading higher education institutions possess the following basic indicator**s:**

- Training human resources with skills and talents 4.0;
- Academic research oriented to smart digital transformation;
- Establishing smart universities;
- Artificial intelligence in smart-university administration;
- Highly internationalized;
- High autonomy.

The author studies, inherits, and designs the following matching matrix shown in **Table 1**.

Table 1

Matrix of general development trends of leading higher education institutions in the region, the world and Vietnam

Criteria for Comparison of higher education institutions	**A**	**B**	**C**	**D**	**E**	**F**	**Criteria/Type of institutions for comparison and reference**
Reference to ASEAN and Asia regional							
Chualalongkorn (Thailand)	X	X	X	X	X	X	ASEAN **region**
Luzon (Philippine)	X	X	X	X	X	X	ASEAN **region**
Beijing University (China)	X	X	X	X	X		Asia region
University of Tokyo (Japan)	X	X	X	X	X	X	Asia region
Reference to World							
Harvard University (US)	X	X	X	X	X	X	World top ranking
Melburn (Australia)	X	X	X	X	X	X	Large international student/student rate
University of Cambridge (UK)	X	X	X	X	X	X	UK top ranking
Paris et Lettres University (France)	X	X	X	X	X	X	France top ranking
Reference to Vietnam							
Hanoi National University	X	X	X	X	X		1000 world-ranking, Vietnam top ranking
HCMC National University	X	X	X	X	X		1000 world-ranking, Vietnam top ranking
Hanoi University of Science and Technology	X	X	X	X	X		Pioneer in Technology
Foreign Trade University	X	X	X	X	X		Typical in entrepreunership
Post and Telecommunications Institute of Technology	X	X	X	X	X		Pioneering in technology, successfully building a digital university model
Hanoi University of Industry	X	X	X	X	X		Typical in application
National Economics University	X	X	X	X	X		Typical in Economics
Academy of Finance	X	X	X	X	X		Typical in Finance
Hanoi Medical University	X	X	X	X	X		Typical in Healthcare
Ton Duc Thang University	X	X	X	X	X		Typical in university autonomy
Duy Tan University	X	X	X	X	X		Typical for the model of a private university
Phenika University	X	X	X	X	X	X	Typical in Creativity

Associating with the positive results, the digital transformation process in education still has several difficulties and shortcomings as follows (Son, 2019): Firstly, tremendous obstacles are revealed in the process of accessing online knowledge in remote and hindered areas: for mountainous or remote areas, network infrastructure, and information technology equipment are not yet completed, which greatly impacts educational management in teaching and learning. This is an issue that must be prioritized to overcome for successful implementation, especially the demand for online teaching and learning while face-to-face platform conditions are unavailable. Second, there comes no strict supervision on digital learning materials to meet the learning and research demands of learners, a proper digital database is of top desire. However, the current human and financial resources fail to fill up this demand. Therefore, digital learning materials these days are visibly rampant, lack authenticity, and are not strictly controlled in terms of quality and content. Thereby, causing the inhomogeneity of knowledge and entailing multiple consequences such as financial waste and time-consuming.

Third, the legal provisions specializing in education have yet to be completed: this is a major problem affecting intellectual property rights as well as information security. Simultaneously, this is considered an opportunity to improve regulations on duration and ways of testing and recognizing online learning results. Nevertheless, these issues have not yet been implemented in a uniform, blatant, and coherent manner, thereby causing various inadequacies during the digital transformation process.

Opportunities for Digital Transformation in Higher Education

Opportunity to Boost Digital Transformation by The Covid-19 Pandemic

From a positive perspective, the long-lasting COVID-19 pandemic is a "leverage" for universities to promote distance learning, online training, and digital transformation. Universities had to close, millions of students had their studies interrupted during the pandemic and the abrupt change has put pressure on universities and students to make a fast shift in the way of training. Thanks to media, digital tools, and learning platforms, numerous universities have made it possible for students to study from home. According to data from the Conference "Online Training of higher education during the COVID-19 Pandemic", up to April 2020, about 110/240 higher education institutions have implemented online training, with different levels. It can be said that "the COVID-19 pandemic has created an opportunity to promote digital transformation in education", online training from situational solutions during the pandemic period has become a trend; Digital transformation is considered a "lifesaver", a "light at the end of the tunnel" - an irreversible trend to adapt and overcome the dilemma of COVID-19. The pandemic cast tremendous downsides for organizations and businesses, but one upside is hastening the digital transformation process (Ministry of Education and Training, 2020).

Promoting Cooperation Between Universities

For better digital transformation, universities must join hands to develop e-learning materials, exchange practical experiences, and strengthen international cooperation in the field of online training. Open educational resources will be available on the information network for all subjects to access. Actually, the learning process will not face any interruption with an open database of materials regardless of location, time, and social distancing. The trend of digital transformation in higher education is taking place fiercely in the region and the world as it is of great significance to have learning and teaching data, universities should bolster sharings, support, and connection with their peers, thereby forming common values. This is also an opportunity for higher education to strengthen cooperation to perfect solutions as well as implement digital transformation.

Industrial Revolution 4.0 Promotes Digital Transformation in Higher Education

The Industrial Revolution 4.0 coupling with physical systems in virtual space, Internet of Things (IoT), and Internet of Services (IoS) does not pertain to the birth of any specific technology.

It is the convergence of various other technologies upon the digital technology platform and integration of all smart technologies. Therefore, the advancement and ubiquitousness of IT as well as Internet users in Vietnam become such an advantage in this digital revolution. Statistics reveal that the number of Internet users as of January 2020 reached 68.17 million, accounting for 70% of the population, including 65 million social network users and more than 145.8 million mobile data network connections in Vietnam. Besides, the rapid development of new technologies such as artificial intelligence, robotics, cloud computing, and blockchain have created favorable conditions to accelerate the process of digital transformation in higher education (Ministry of Education and Training, 2020).

Delivery of a Personalized Learning Experience

Personalization in learning has been widely applied at universities around the world to enable lecturers effectively to deliver knowledge based on the ability of each student with a learner-centered approach. As for the university, utilizing digital platforms in composing learning materials, and organizing teaching as well as exams, by different tools and AI services can easily handle and provide schools and teachers with useful data and information for learners. This data can include the process and how each student experiences the learning process, thereby improving and changing the approach to each individual learner in the most flexible fashion (Heinemann & Uskov, 2018).

Difficulties and Challenges for Digital Transformation

- Network infrastructure, IT equipment (such as computers, cameras, printers, scanners), transmission lines, and internet services for schools, lecturers, and students - especially in remote and disadvantaged areas - are still insufficient, backward, and unsynchronized. There are a number of places yet to meet the requirements for digital transformation (both in education management and teaching-learning).
- Digitizing, building, updating digital learning materials, evaluating and sharing digital materials requires an enormous investment in human resources (including management and implementation personnel) as well as finance in order to ensure a complete, high-quality digital database that meets the requirements of learning, research, and reference of students at all levels, disciplines, and subjects. Hence, the matter of building digital learning materials (such as e-books, electronic libraries, multiple-choice question banks, electronic lectures, e-learning software, and simulation application software) remains spontaneous and unsystematic with certain order in accompany with obstacles in controlling the quality and contents.
- Collecting, sharing and utilizing education management data and digital learning materials needs a proper common legal framework in accordance with regulations on copyright, intellectual property, information security, electronic transactions and the law on information sharing and provision, including specifying the list of information subject to mandatory declaration and data entry - distinguishing it from private personal information belonging to individuals; copyright regulations for electronic lectures; regulations on the exploitation of databases and digital data archive (personnel entitled to exploit, what exploitation, to what extent, what conditions, who appraises, who allows); stipulating the legality of electronic records in general and grade books and electronic school records in particular.
- Upon given general legal provisions, it is of top significance to improve the regulations in the training institutions, including ones on online learning programs, study duration, online assessment and quality accreditation, recognition of online learning results; prescribing conditions for organizing classes and schools in the network environment.

"Digital transformation is not a revolution of technology, but an institutional one." - stated Minister of Information and Communications Nguyen Manh Hung.

Prof. Dr. Le Anh Vinh posits that the biggest obstacle to digital transformation in higher education contains two factors: culture and cost. The willingness to change reality for teaching staff and the institution itself is sometimes rather difficult for students. Thus, the top barrier is not about technology, but about people's readiness and openness to accept changes. Therefore, according to Prof.

Dr. Le Anh Vinh, "One of the prerequisites for successful digital transformation is how ready we are to embrace change and accept all innovation. Vietnam's higher education needs adequate investment and determination to digital transformation" (Hung & Duc, 2020).

Several Solutions to Promote Digital Transformation in Vietnamese Higher Education

By analyzing influencing aforementioned factors, difficulties, and limitations, in order to promote digital transformation in education and training in the time to come without missing the opportunity offered by the Industrial Revolution 4.0, higher education needs to focus on implementing a number of specific contents as follows:

First, they should disseminate, propagandize, raise awareness and responsibility, claim transparency in ideology and determination to implement digital transformation; as well as build a digital culture in education and training.

Second, it is required to continue to promote the implementation of e-Government, towards digital government in the whole education sector. Which, focuses on implementing and perfecting the database system of the whole education and training sector (general education and higher education) connecting and sharing data from central to local, schools and synchronized with national databases and other specialized databases in contribution to forming the national open databases; promote online public services to serve the people; thoroughly digitize, use electronic documents, school records, and electronic grade books instead of paper archive; direction, operation, trade, hold meetings and training activities are performed mainly in the network platform.

Third, the quality of forecasting (Big data technology, AI, Blockchain) should be enhanced coupling with improving the policy mechanism in the direction of one step forward. Among those, the policy of perfecting the education management database must be of top priority in accordance with the regulations on data sharing and exploitation; Besides, a legal framework should be perfected to promote the development of online teaching and learning; the management policy of online courses ensures quality through regulations on conditions for opening schools and classes, assessing and licensing content, accompanied by appropriate sanctions, avoiding loss of control, and protecting legitimate rights of learners.

Fourth, it is also significant to perfect synchronous network infrastructure, and practical IT equipment for teaching and learning, which creates equal learning opportunities among regions with different socio-economic conditions, prioritizes rental services, and mobilizes social resources to participate in the movement.

Fifth, relevant bureaus should promote the development of digital learning materials (for teaching - learning, testing, assessment, reference, and scientific research) at all levels, disciplines, and subjects associated with content assessment, connecting and sharing learning materials between localities and schools; form a repository of digital and open learning materials for the whole sector, linking with the world, meeting the needs of self-study, lifelong learning, and mitigating the gap between regions; continue to innovate teaching and learning methods based on the application of digital technology, encourage and support the application of new education and training models based on digital platforms.

Sixth, the Government should deploy an educational social network with consistent control and orientation, creating a digital environment for connection and sharing among education authorities, schools, families, teachers, lecturers, and students; develop open online courses, form an open learning network of Vietnamese people; administer a shared online learning system for the whole sector to serve the training of teachers and support teaching for disadvantaged areas.

Finally, there is also a need to train and foster a team of managers and teachers with the necessary IT knowledge and skills to operate in the digital environment to meet the requirements of digital transformation.

Strategies and Solutions for Developing Skilled Human Resources Ready for the Global Concept of Industrial Revolution 4.0

In Vietnam, the National Digital Transformation Program to 2025, with a vision to 2030, education and training is one of the eight top priority aspects in digital transformation implementation with specific tasks:
- Developing a support platform for remote teaching and learning, thoroughly applying digital technology in administration, teaching, and learning; digitizing documents and textbooks; building a platform to share teaching and learning resources in both face-to-face and online forms.
- Developing technology for education, towards personalized training.
- 100% of educational institutions implement distance learning and teaching, in which a pilot training program allows students to study online at least 20% of the program's content. Use of digital technology to assign homework and check students' preparation before class attendance.

On the basis of a full and comprehensive analysis of the program goals of the National Digital Transformation Program to 2025, with a vision to 2030, the Military Medical Academy has determined the objectives and orientations for the development of education and training in digital transformation period as follows:

Composal of Training Programs Upon Skilled and Talented Human Resources

The main strategy focuses on developing and organizing the implementation of undergraduate and postgraduate training programs in the direction of integration, based on competencies and output standards, ensuring the formation of necessary competencies for learners such as professional practice capacity, IT capacity, foreign language ability, and other soft skills. Moreover, there would be also the self-assessment and evaluation of the training program according to the accreditation standards of the Ministry of Education and Training.

Innovation In Teaching and Assessment Methods

New methods encompass composing a process and applying active teaching methods according to the switching classroom model, effectively using IT applications to support active teaching; and building a complete, modern, and synchronous E-learning teaching system with the LMS (Learning Management System) associated with a complete digital learning system for theoretical and practical lectures.

Improvement of the Quality of Teaching Staff and Educational Administrators

This strategy includes establishing a contingent of lecturers meeting the criteria of a researching university: the ratio of permanent lecturers with a doctorate degree is over 55% of the total number of lecturers, in which the percentage of lecturers holding the title of Professor, Associate Professor reaches over 30% of the total number of full-time lecturers have doctorate degrees. Foreign language and IT competence: 100% of lecturers have a foreign language level 3 or higher (according to Vietnam's competency framework), of which 100% of teachers under 45 years old have a foreign language level 4 or higher, 30% of lecturers can teach subject matters in English; 100% of lecturers have basic IT capacity, of which 30% have advanced IT capacity.

Application of Artificial Intelligence in Management and Administration

In a view to fulfill this mission, a series of tasks should be conducted, including completing synchronously the IT infrastructure, digitizing 100% of the training database, and applying IT, digital technology, and artificial intelligence in the entire management and administration of training under the smart school model (planning, training program management, administration on lecturers and students, training results management, etc.). The model of pupil and student management is consistent with current regulations, modernity, and integration, creating a positive environment and motivation for learners to study and practice.

Investment and Upgradation of Training Facilities

Investment and Upgradation of Infrastructure and Systems of it Applications and Digital Transformation in Service of Management, Command, Administration, Training, and Treatment

- IT infrastructure: Including modern and synchronous equipment systems to ensure proper operation of the Academy, this system is capable of connecting and expanding the data center (servers, network devices, safety, and security equipment); connection and transmission system (intranet-LAN, Wifi network); control system (attendance system, smart sensor integrated camera) and public management equipment system integrated with Internet-IoT (fire prevention system, intelligent lighting).
- IT application system: Including a system of supporting software for command and control; e-learning system; training management software, and management of scientific research activities... The system of supporting software is built on the basis of smart technology such as artificial intelligence, IoT, and cloud computing, which ensures comprehensive, unified, and interconnected management of all training, scientific research, treatment, and unit-building activities. This enables quick, accurate, and efficient management and operation in the network space.

Investment and Upgradation of Digital Libraries:

Invest in and upgrade a smart, modern, synchronous, and friendly digital library, linking training and scientific research activities under an advanced, preeminent digital library in the direction of “Learning commons space”, which matches the development trend of libraries in the world. Establish and develop the institution’s journal under the standard of prestigious international journals (ISI, Scopus).

Application of Artificial Intelligence to Build the Simulation Center:

Including the system of hypothetical systems, training models, and clinical simulation models; skills training models and simulations are operated by specialized software, meeting the world's testing standards.

Investment in Building Renovating and Upgrading Classrooms, Lecture Rooms, Multiple-Choice Examination Rooms, and Laboratories:

Upgrading and strengthening the system of laboratories and practice rooms of the subjects, ensuring the "dual use", both serving training, scientific research, and treatment. Upgrading the system of classrooms, smart lecture rooms, clinical classrooms, and multiple-choice exam rooms: including synchronous devices with internet connection (high-tech interactive whiteboard, terminal and sound system, management software, teaching software, etc.).

Conclusion

It is crystal clear that the digital transformation process in a higher education institution is a self-renewal to meet the intrinsic development requirements of the institutions and better respond to learners. Especially, the recent COVID-19 pandemic has cast an unprecedented impact, burgeoning tremendous challenges but also opportunities for higher education to undergo extensive and comprehensive digital transformation. Higher education is required to overcome obstacles in service of continuing the innovation roadmap, promote solutions to adapt to the pandemic conditions in order to shift from face-to-face training to a blended platform, persist in the quality goal, and continue to promote comprehensive digital transformation. Higher education institutions need to closely coordinate, jointly build, and share the use of data platforms, learning materials, learning environments, and school administration and management systems.

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