IMPACTS OF 4TH INDUSTRIAL REVOLUTION ON EDUCATION 4.0 IN VIETNAMESE CONTEXT ALONG WITH POTENTIAL SUGGESTIONS

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Abstract: *The paper begins with a description of the overview, characteristics and benefits of 4.0 Industrial Revolution for students and teachers. In accordance with the nine trends of Education 4.0, the impacts (benefits and challenges) of the Industrial Revolution 4.0 on Education 4.0, especially higher education, will be outlined and followed along with some ideas on how to implement Education 4.0 trends in the higher education system in Viet Nam.*

Keywords: *4.0 Industrial Revolution, Education 4.0*

I. Introduction

The 4th Industrial Revolution has started the process of transforming from automatic production to intelligent production with the continuous improvement of equipment and management methods with higherquality and efficiency. The 4th Industrial Revolution is strong enough to be an inevitable change within the education setting, making Education 4.0 the currently famous mentioned among educationists. Education in the era of the Fourth Industrial Revolution is an education conducted in all conditions and circumstances through connecting devices between teachers and learners. The 4th Industrial Revolution has created a great change in education, especially in terms of training programs with increasing integration from 'single discipline' to 'multidisciplinary'. The fact that education trains people with not only practical knowledge and expertise but also positive moral and physical qualities effectively serves the socio-economic development associations of each country or each ethnic group. The application of digital technology in education is becoming more and more widespread and necessary. In other words, higher education, with more important role to play in the development of society, will change profoundly from the educational environment, the role of teachers and learners to teaching methods. This creates more and more diverse and intelligent digital education systems, and at the same time becomes an industry. Vietnam is facing the big challenge of a shortage of highly qualified, specialized, and skilled

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workers. Therefore, to renovate higher education to meet the requirements of the labor market, it is necessary to raise awareness and renew thinking on higher education development; renovating training programs and methods; applying technology to the teaching process; renew the model of linkage between universities and enterprises, improve the quality of teachers and administrators. This is the development direction that Vietnam needs to prepare for incessant changes in the future.

II. Content

2.1. The emergence of Industrial Revolution 4.0

The rapid change of knowledge has created a new educational model for the future. The 4th Industrial Revolution is developing at an exponential, not linear, pace that not only changes "what" and "how" to do things, but also "who" we are. The 4th Industrial Revolution presents the contents listed as the revolution the fourth industrial network, its emergence and its profound changes; especially, the impacts of the 4th Industrial Revolution on all areas of social life, especially for the world labor market (Klaus, 2018). The digital infrastructure for knowledge making, knowledge storing, content-creation,and sharing as most recent movement to digital times has seen further shifts in the ways that research is conducted and brings into play considerations about the impact of digital culture and technologieson how knowledge-making is conceived. In short, it has been asserted that countriesaround the world have come up with breakthrough policies to take advantage of the opportunities and overcome the challenges brought by them.

2.2. The role of Education 4.0

Education has intertemporal value in our society, in which, its primary role is to create values and shape attitudes and behaviours aligned with society's expectations besides the secondary roleis to provide students with the knowledge and skills they need to succeed in life.

Education 4.0 is a response to the needs of Industrial Education 4.0 where human and technology are aligned to enable new possibilities. Education 4.0 is crucial to begin the reskilling revolution to meet the current demand in digital skills and competencies and the future needs. In other words, maintaining a changing world is important, in which, Education 4.0 is the method used by educational institutions to ensure this. In Education 4.0, learning is built around them through data-based customization; that is to say, the teachers assume the role of facilitators in their learning whereas learners learn together and from each other. In short, Education 4.0 was recognized as a respond to Industry 4.0, greatly increasing the use of Internet technologies and cross-communication tools; in other words, the growth of modern research shows that education should keep pace with the student world and provide them with a secure and sustainable future.

The World Economic Forum, upon announcing the 4th Industrial Revolution, predicted a "major shift about the future of jobs" in accordance with a new setof jobs expected to emerge, composing Human skills and EQ as most important and valued. What is "needed" in life has a

dynamic nature that changes with culture and technology evolution. Especially nowadays, that the world is currently undergoing a rapid digital transformation results in the urgency for educational systems to adapt. Over the last decade, the deployment of online education has grown exponentially. The current state of education (blended learning) in this new technological boom in addition to the increased demand for the newly aligned educational goals brings in the Education 4.0 implementation with the important role towards teaching the necessary digital skills. Therefore, education has changed dramatically and both students and teachers have no other option than to use the online platform uninterrupted learning and teaching, which booms the usage of online learning - is a transition from the traditional learning model to the online learning model as an inevitable trend in the future. Therefore, the digital transformation/digitization in educational institutions, especially digitization in management and training organizationis an important basis for implementingthis model besides investing, building infrastructure, equipment, teaching personnel and so on.

Table 1: Results of Industrial Revolution 4.0 in Education

(Adapted from Priaya, 2019)

Parameters	Achieved results	Remarks
Achieved benefits of Education 4.0 for Teachers	Revolution of Education 4.0 offers new education system and transform innovative learning; thereby, causing improvements in teaching	Utami et al. (2019)
Benefits of Education 4.0 for managers and Administrators	One of the most important challenges of implanting Education 4.0 is lack of knowledge among managers and administrators	Hariharasudan & Kot (2018)
Benefits of Education 4.0 for students	Students will learn new digital skills which will enhance their career growth	Hussin (2018)
Influence of 4th Industrial Revolution on Higher Education	It will bring smart machine integrated with Internet of things	Baygin et al. (2016)

2.3. Major trends of Education 4.0

The 09 trends related to Education 4.0, presented by Fisk (2017), mainly concentrate on the student/learner component as the core feature as follows: (1) Learning can be anytime, anywhere: E-learning tools offer opportunities for remote, self-paced learning. The flipped classroom approach plays a role allowing interactive learning in class while the theoretical parts can be learned outside the class time; (2) Learning is personalized to individual students: Harder tasks are introduced only after a certain mastery level is achieved. Positive reinforcements promote positive learning experience, boosting students' confidence about their academic abilities; (3) Students have a choice in determining how they want to learn: Students are free to choose the

learning tools or techniques they prefer although the learning outcomes of a course are presented by the institutions; (4) Students will be exposed to more project-based learning: Students apply their knowledge and skills in completing short-term projects which allow them to practice their organizational, collaborative, and time management skills, all of which are useful in their academic careers; (5) Students will be exposed to more hands-on learning: Through field experience including internships, mentoring projects and collaborative projects, technology advancement enables the learning of certain domains effectively making more room for acquiring skills that involve human knowledge and face-to-face interaction; (6) Students will be exposed to data interpretation: Students are required to apply their tech or ethical knowledge to numbers and to use their reasoning skills to make inferences based on logic and trends from given sets of data; (7) Students will be assessed differently: The conventional platform to assess students may become irrelevant or insufficient. Factual knowledge can be assessed during the learning process while the knowledge application can be tested during the project working time in the field; (8) Students' opinions will be considered in designing and updating the curriculum: Students' inputs help the curriculum designers maintain curriculum contemporaries, up-to-date, and usefulness; (9) Students will become more independent in their own learning: This will force teachers to assume a new role as facilitators who will guide the students through their learning process.

In short, this new vision of learning promotes learners towards the combination between human (learners/students themselves) and technology (digital tools) for new possibilities whereas teachers will move into a new role as designers, catalysts, mentors, and creators of learning environments, in which, the digital learning system provides feedback on learning performance along with recommendations for additional learning content.

2.4. The impacts of Industrial Revolution 4.0 on Higher education

Higher education in the 4.0 Industrial Revolution is an open, rational and dynamic door that can change the thinking of society and upgrade the living standard. This wave creates opportunities as well as sets essential requirements to build 4.0 Education. In general, Education 4.0, as a smart, virtual and digital revolution for the benefit of teachers, has a great change in training goals and methods, moving from imparting knowledge to the masses to unleashing potential and empowering individuals to create. First, it is beneficial for school teachers for the reason that they can better meet the students' specific needs. With digitized learning content, learners will have their learning path, can choose content suitable for training goals. Second, Education 4.0 permits teachers by providing the best methods and techniques to facilitate work through performance enhancement towards teachers' skills and learners' learning outcomes. Third, 4.0 Educational environment extends to the global scale. Learners can actively study materials as well as interact with lecturers at any time using computers or smartphones.

Last but not least, online learning form development helps learners save time, effort, and costs. In short, Education 4.0 becomes an ecosystem that creates creative products of individuals, with knowledge and capacity for innovation and creativity of individuals where everyone canlearn together anytime, anywhere with connected devices.

2.5. The challenges and the opportunities for Vietnamese higher education

Regarding the higher education development in the 4ᵗʰ Industrial Revolution context, Vietnamese education has basic advantages to accept the development opportunities that this Industrial Revolution brings. The Vietnamese government has alwayspaid attention to the cause of education, especially in the context of rapidly developing science and technology. The 8ᵗʰ Conference of the 11ᵗʰ Party Central Committee issued Resolution No. 29-NQ/TW on a fundamental and comprehensive renovation of education and training to meet the requirements of industrialization and modernization. In the context of a socialist-oriented market economy and international integration, on November 4, 2013, the Prime Minister issued Directive No. 16/CT-TTg on increasing access to the Public Revolution (May 4, 2017). The Ministry of Education and Training has developed a Project to support learners to start a business by 2025; Projecton capacity building of lecturers and managers of higher education institutions to meet the requirements of a fundamental and comprehensive renovation of education and training in the period of

2019 – 2030. In short, our Vietnamese overall higher education development strategy for the period 2021-2030, with a vision to 2035, is the foundation for innovation, comprehensive development and long-term sustainability of the higher education system.

These innovations have positive effects on the quality of our Vietnamese education, especially, higher education. The university, as a place to provide high-level human resources for society, must comprehensively change both in terms of model, program content, and training methods. The training and scientific research activities face challenges and opportunities as new reform and competition requirements before the development of Industry 4.0. Teachers, a force that plays a key role in educational innovation, are always interested, invested in, and supported in capacity building. Vietnamese educational program places great emphasis on helping learners gain a deep understanding of core concepts and knowledge mastery. The new general education program will be put into operation, moving from a content approach to developing capacity and quality willbe the premise for the fundamental and comprehensive renovation of general education.

2.6. Innovative solutions for Vietnamese higher education in Industrial Revolution 4.0

The essence of teaching management activities is the determination and direction of the implementation of the objectives, plans and programs of teaching content of the lecturers, as well as the management of

the teaching process, in which, the target output standards and training requirements meets the strong impact of the 4th Industrial Revolution. This requires that leaders and managers need to pay attention to the synchronous implementation of some measures; in other words, it is our top priority to raise awareness regarding the general development strategy as follows:

2.6.1. To change the traditional teaching mindset is to direct the renewal of teaching content, forms and methods to approach the impact of the Fourth Industrial Revolution.

The impact of the 4th Industrial Revolution created a rapid change in all related activities. This requires that the content and form and methods of teaching must be innovated accordingly. Leaders and lecturers need to pay attention to the direction of innovation in the content, form and methods of teaching and learning according to the principles of continuously supplementing and standardizing the content of the curriculum to meet the requirements of each student's duties and practical tasks in different positions or working majors after graduation or graduation. What should be taken into consideration is the impact that online learning has on the academic performance of a student depends on the following factors: teacher factors, learning conditions, student engagement, and student performance. The participants of the study indicated that their performance was impacted positively by the interest that their teachers had in their learning. Educators had better identify the factors in their own teaching environments and will be able to better determine how their

performance, or the performance of their students, can be improved. Furthermore, to identify the various aspects of the online learning experience that students were satisfied with helps educators to understand more about the factors that contribute to student satisfaction. Through this enhanced understanding, educators evaluate their own teaching methods to determine whether it is conducive for student satisfaction.

2.6.2. To alter teaching and studying methods.

The trend of increasingly strong impact of the 4th Industrial Revolution requires that the determination of teaching plans and programs must be comprehensive, associated with the output standard orientation both in terms of the level and skills of the learners. Well-executing the development of teaching plan and program is the basis to ensure the identification of specific knowledge contents that need to be equipped for learners in each school year and each semester. From the need for review and assessment of the quality of the teaching staff of foreign languages in a substantive manner through the progress of completing the teaching quality, teaching skills, or through surveying the evaluation of learners by polls, promptly take appropriate measures to continuously improve the quality of foreign language teaching staff in terms of both competence and pedagogical skills; focus on directing the development of plans, mechanisms and policies to support the study to improve the qualifications of the teaching staff; regularly and periodically organize conferences and seminars to help foreign

language teaching staff improve their knowledge, experience, and teaching skills; attach importance to the leadership and direction of building a healthy pedagogical environment in order to promote the activeness of self-research and study to improve the professional and pedagogical competence of the lecturers; mainly interested in promoting research, technology application and digital transformation in foreign language teaching, especially in teaching translation and interpretation; directing the objective and substantive implementation of the examination and evaluation of foreign language teaching results of lecturers and students.

What is more, in terms of blended teaching, to successfully apply the blended teaching model in online teaching, a synchronous policy of the State on this issue, digitization in management and training organization are required. In addition to the investment and change from the University and the teacher, the main factor is the learners themselves,the learners in all grades and levels need to adapt to learning in the digital environment in their learning process. However, in order to have more theoretical and practical bases to help widely deploy the form of blending model teaching in general and teaching this in University education in particular in the future time, it is necessary to continue to have more extensive researches related to this form of teaching.

In short, these above suggestions are to adjust educational thinking. To manage the development of the overall teaching plan and program to meet the requirements

of the 4th Industrial Revolution. Leaders at all levels need to focus on directing research work and selecting curricula to ensure updating; directing faculties and departments to actively apply information technology and simulation software to renovate the form of organization in order to increase visualization, help equip and consolidate knowledge and skills for future practical usage. Directing the review and development to meet training objectives and requirements is extremely urgent and important should be directed to solving the core contents of: reviewing and developing the staff, the numberof lecturers, human resource structure, professional qualifications, computer application level besides personal dedication to the profession; at the same time, enhancing the self-discipline to improve the lecturers' teaching capacity towards the direction of meeting the requirements from the current demanding labor market.

2.6.3. In terms of modern facility equipment, the strong impact of the 4th Industrial Revolution leads to the birth of a series of effective tools and software to support foreign language learning.

With the development of the 4th Industrial Revolution, the pervasive ability of the Internet has gradually transformed training activities from teaching to coaching. This requires teachers to have a practical approach to guide learners to solve specific situations in life based on the provided background knowledge; contribute to increasing the applicability of learners to the rapid change in the production environment. Accordingly, leaders and need to pay attention to

directing authorities to promptly research, purchase and update equipment, and appropriate modern teaching support software with the existing capabilities and conditions to practically serve the process of method innovation, in order to increase the visibility and vividness of thelectures and bring about high efficiency in the process of perceiving and absorbing knowledge. In particular, special attention should be paid to directing and ensuring necessary facilities for foreign language teaching listed as computers, network, LAN, Internet connection, projectors, screens, speakers, radios, and headphones, illustrating lectures with Video - Projector, Power point, multiple choice software, question software combined with intellectual games and so on along with the attention to equipping modern facilities and teaching facilities. In this modern time, leaders and managers need to direct the relevant authorities to organize guidance and training for lecturers to overcome difficulties and rise to master the process of exploiting and transporting effectively use new and modern facilities and technical means in the teaching and study process.

III. Conclusion

In the 4th Industrial Revolution, Education has an increasingly important role and position, in which, education should be motivating, inspiring and potentially broad challenges for individuals and societies. If the 4th Industrial Revolution progress is misused, it will unquestionably cause the leading away from daily lifestyle, the quality and the nature of Universities. In this way,

higher education should develop codes of ethics and responsibility to monitor the progress so that teachers and learners must have appropriate digital and virtual education cognition for being successful in future workplace. That our country Vietnam must meet the requirementsof industrialization, modernization and international integration requires the exploiting available strengths and seize opportunities with the purpose of overcoming challenges and developing Vietnamese education. The ability to manage with this experiment and to take advantage of the opportunities offered is feasible; the point is that a comprehensive approach besides to preserve core attributes and ethical standards is necessary.

References:

[1]. Fisk, P. (2017). *Education 4.0… the future of learning will be drammatically diferent, in school and throughout life.* Retrieved from http://www.thegeneniuswork.com/2017/01/ future-generation-young-everyone-taught- together

[2]. Klaus, S. (2018). *Fourth Industrial revolution (Ministry of Foreign afairs and proofreading).* Hanoi: National Political.

[3]. Nam, N. (2018). *Cách mạng công nghiệp 4.0. và các yêu cầu đặt ra đối với các mô hình trường học thông minh trong nền giáo dục 4.0.* TC Khoa học Quản lý Giáo dục (3), 55-62.

[4]. Priya, S. (2019). *Digital Revolutionof Education 4.0.* Internationalk Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249-8958 (Online), Volume-9 Issue-2.

[5]. Shwab, K. (2016). *The Fourth Industrial Revolution: what it means, how to respond.* Retrieved from https://www.weforum.

org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond

[6]. Tâm, T. (2017). *Tìm hiểu về cuộc cách mạng Công nghiệp 4.0.* TC Khoa học Đại học Văn Lang (06), 34-40.

[7]. Tri, N. M., Hoang, P. D., & Dung, N. T. (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

[8]. Tung, L. (2018). *Cách mạng công nghiệp 4.0 và những tác động đa chiều đến giáo dục Việt Nam hiện nay*. TC Khoa học Quản lý Giáo dục (3), 40-48.

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