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Suggestions for training strategy of Thu Dau Mot University in the process of approaching industrial revolution 4.0

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ABSTRACT:

Industrial Revolution 4.0 has become an indispensable trend in the development process of Vietnam and is increasingly applied in university education. The essence of the Industrial Revolution 4.0 is the application of technology, data science and the use of artificial intelligence for production and human life. In this impact, modern education, especially higher education, is the field most affected. Online teaching, with tools to support the teaching of the digital age, has been changing dramatically in the teaching and learning situation in universities, helping to modernize education and integrate with the world, but there are many issues that teachers and managers must consider to change teaching methods and training strategies, in order to deliver the best results. Starting from the actual situation, we propose specific and comprehensive measures to improve the teaching efficiency of Thu Dau Mot University and, to meet the needs of Vietnamese society and the development of Industrial Revolution 4.0.

Keywords: *Industrial Revolution 4.0, university education, Thu Dau Mot University*

1. Introduction

Revolution 4.0 has been a challenge for our country's socio-economic field, including university education. On May 4, 2017, the Prime Minister issued Directive 16 / CT-TTg on strengthening the capacity to access the industrial revolution 4.0. A day later, 5/5/2017, the Minister of Education and Training signed the official letter 1891/BGDĐT- GDDH to send universities and colleges on the task of training human resources to adapt to Industrial Revolution 4.0. This shows that increasing opportunities of education development in the 4.0 era is an urgent issue.

Thu Dau Mot University is a multi-disciplinary educational institution, developed according to the advanced university model in the country, so it cannot be out of that trend.

2. Some issues of University education with the Industrial Revolution 4.0

2.1. Industrial Revolution 4.0

Humanity has experienced several industrial revolutions: the first (taking place around the second half of the 18th century to almost the first half of the 19th century), characterized by a change from manual production to mechanical production by steam engine; the second (taking place around the second half of the 19th century to World War I - 1914) characterized by a shift from small-scale production to large-scale manufacturing using electrically powered devices; the third time (taking place around the 1970s of the 20th century to several decades) characterized by semi-automated manufacturing based on computers, electronic devices and the Internet. From the early years of the first decade of the 21st century, there have been signs that humanity has entered the fourth industrial revolution characterized by intelligent manufacturing which is integrated with the following factors: Artificial Intelligence (AI), Internet of Things (IoT) and Big Data (Big Data); in which:

- + Artificial Intelligence means that human intelligence is expressed through an artificial device system thanks to the development of digital technology and computer utilities;
- + Everything connected is understood as a set of electronic devices capable of connecting things and phenomena around people with people, with the Internet system and with the world outside the earth to achieve many human purposes (network of devices connected to the Internet);
- + Big data is understood as a highly complex multi-data set that cannot be handled by utilities for traditional data processing applications due to the huge challenges in collection, analysis, monitoring, storing, transmitting and connecting such data for economic development, cultural, educational, health, defense and security activities.

The integration of the above three factors has created a scientific breakthrough in smart self-action devices that are at the core of the breakthrough which is the achievements of

the development of digital super technology. This is the period when humanity has entered into intellectual civilization, with all thinking and actions deployed by or supported by ultra-smart electronic devices in a system connected to everything by means of artificial intelligence.

2.2. Industrial Revolution 4.0 in education

Education and training development always has a dynamic balanced relationship with socio-economic development. From that, it is inevitable that contemporary education and training must be a smart education based on the breakthrough of science and technology in general, including digital technology. It is an education whose goals, programs, content, methods and forms of organization, means and conditions, performance assessment are based on both the achievements of the Industrial Revolution 4.0 (the breakthrough achievements of digital technology integrated into artificial intelligence, connected things and big data), and the goals of socio-economic development of humanity. Such education must aim to create "educational products" which will become social human resources integrated with the main competencies:

- Basic and specialized research capacity in order to create basic principles and theories in the scientific fields in general and especially in digital technology development.
- Applied research capacity aims from the basic research achievements in digital technology to create super-smart devices with artificial intelligence to analyze big data and connect things.
- Ability to master super smart devices to carry out activities of scientific research, technology development, production, commerce, culture, education, health, security and defense to meet the diverse needs of people in a civilized society.
- Ability to manage the system of things connected, in which mainly administering the system of super-smart devices in order to create relationships between existing entities that will appear in Flat World together.

The delimitation of the competency requirements of contemporary human resources mentioned above is only approximate; in reality, these capacities always have an interfering and complementary relationship to form a whole contemporary citizen capacity.

In addition, due to advances in information and communication technology, general education for everyone is replaced by personalized learning. Revolution 4.0 creates new breakthroughs in training activities, changing objectives, traditional teaching models by completely new methods and programs. The development of information technology, digital tools, networking systems and metadata provide effective tools and means to change the way organizations and teaching methods. Traditional classes with disadvantages such as: large number of students, fixed class space, not implemented to

be taught differentiation,... will be replaced by online classes, also called virtual classes. In the later, the quality of training is easily controlled by supporting tools, such as sensors and cyber connectivity. Learning space will also be more diverse. Besides, students can experience learning in virtual space, can interact in real conditions through software and network systems. Big data will be an endless source of data to learn the experience of analyzing, identifying trends or forecasting business at a high level of accuracy. Digital learning resources in terms of connecting real and virtual spaces will be extremely rich, library space is not only a specific place but can be exploited anywhere with some simple operations. The curriculum is also designed to be more diverse, more specific and more effective to meet the needs of each students.

2.3. Revolution 4.0 with University Education

In that context, university education in Vietnam is undergoing strong changes to meet the needs of the society. Industries related to the Industrial Revolution 4.0 such as information technology and biotechnology have grown strongly. Therefore, the training content will have to change, a lot of specialized knowledge and skills will have to expand towards revolutionary requirements 4.0.

Currently, the Ministry of Education and Training is still using the list of industries, professions and universities selected. In the era of Industrial Revolution 4.0, the list of industries and trades will be outdated and the industry will be "variable industry". The fundamental reason for the peculiarities of Industrial Revolution 4.0 is the appearance of artificial intelligence, automation technology, new materials and information technology in data analysis (big data).

Due to the peculiarities of the times, teaching in class is no longer merely showing information because almost all knowledge can be found online. With the industrial revolution 4.0, students must study by themselves. The role of the teacher has shifted from the instructional state towards, guiding students through projects, solving problems in reality, and more importantly, guiding the thinking of similar situations. This forces the lecturer to go to practice.

The type of training has also changed: information technology advances appear in mass training systems and in online training; these are new types of training that challenge previous training methods. This requires the school to research and develop new technologies that meet the requirements of the Industrial Revolution 4.0, to serve the new industry. According to Associate Professor, Dr. Ho Thanh Phong - Rector of International University (National University of Ho Chi Minh City): "With the 4.0 revolution, there is a need for a 4.0 education, in which people, machines and equipment, jobs are connected everywhere to create a personalized education. In this new concept, people, programs, media are transformed into smarter objects, placed in

the ecosystem of creativity and entrepreneurship. With education 4.0, the focus is on creativity and value creation. The curriculum is no longer a single discipline but a "variable industry".

In the face of the advantages that Industrial Revolution 4.0 brings, it is necessary to recognize the reality of the existence of higher education in our country: the main approach of education in Vietnam is in the direction of monodisciplinary and multidisciplinary, using technology at the level of paper, pencils, computers, laptops; so teaching is mainly one-way or two-way. Despite the fact, the education management staff of our country has gradually met the standards and initially approached advanced methods of education and management. However, there are still backlogs such as Resolution 29- NQ/TW stated: "Education and training management still has many weaknesses, lack of enthusiasm, even violations of professional ethics. Thinking about the direction of education is slow to innovate, heavy on direction, management according to administration, orders, mechanisms of application- for, legal documents system, standards of quantity, professional qualifications, ethical qualities of managers; that all have been elaborated quite detailed but have little effect".

3. Some suggestions for training strategy of Thu Dau Mot University in the process of approaching Industrial Revolution 4.0

Firstly, the faculty must have high qualifications in both expertise and information technology, so the school should focus on training human resources. The university can regularly organize training courses, seminars, conferences for lecturers to update their professional knowledge and technology. In addition, the university must expand dialogue and cooperation with enterprises in research, training and consulting activities; thereby teaching staff have the opportunity to approach production and business reality and grasp the changes of the market to make adjustments in teaching.

The foundation of Industrial Revolution 4.0 is the connection between the real world and the virtual world through information technology software, digital technology and networking. Therefore, information technology and digital technology knowledge and skills are very important for the school. We need to train a full team of IT professionals to be able to implement online classes, manage digital data, and conduct scientific research. Lecturers should actively equip students with digital knowledge and relevant skills to increase their competitiveness upon university.

Secondly, the restructuring of labor forces between sectors is taking place strongly. Machines with endless resources can deliver interesting lectures in some subjects such as geography, history and can completely replace the current teachers. Employment in such areas as legal consulting or accounting can also be completely replaced by

intelligent robots. The school needs to have a training orientation to meet the industry requirements of the Industrial Revolution 4.0 and retrain to adapt to the new profession. Therefore, it is important to diversify vocational training, combine relevant professions to increase recruitment capacity of students.

Thu Dau Mot University should collaborate with big enterprises to form a new university model, such as University-Enterprise. It is necessary to transform the teaching of available academic knowledge into teaching according to the needs of businesses and the market both in the presence and in the future.

Third, the training program should be flexible, open-ended, with integrated content to suit the needs and trends of the labor market. The school program must combine both directions: on the one hand it must meet the social orientation; on the other hand, it must be the training of human resources to meet the requirements of the labor market. The training program must ensure high expertise and meet interdisciplinary characteristics (information technology, digital technology, networking, specialized knowledge). We need to strengthen the training of essential skills for students: system thinking, integrated skills, linking real and virtual worlds, teamwork skills, creativity and interdisciplinary collaboration. In the context of rapidly changing technology knowledge, equipping the way of self-learning and a sense of lifelong learning is more important than the knowledge of the training program. Thus, the Industrial Revolution 4.0 puts great pressure on Thu Dau Mot University, but at the same time creates opportunities for us to innovate comprehensively: building programs, updating content, reforming teaching methods, testing and evaluating.

For university level training programs, in addition to professional knowledge, are necessary to expand in order to provide more natural social knowledge blocks, information technology, and network management. The learners need to quickly adapt to changes in technology, work effectively in a highly connected environment, between different fields, between virtual and real worlds. Skills that are important to human resources in a technology interaction environment should be included in the output standards of the training program, namely: teamwork skills, creative skills, critical thinking, system thinking, decision-making skills in uncertain conditions. The learners should especially be focused on methods and a sense of lifelong learning.

Designing short-term training courses or programs to supplement knowledge for different subjects in enterprises is really necessary in the context of Industrial Revolution 4.0. The society's demand for additional knowledge will be extremely great when there is a shift in the industry structure, a change in technology. Industrial Revolution 4.0 will open up an extremely large training and training market for companies providing educational services, especially universities, which have strengths

in training. However, the University needs to be more open for the dialogue with the society and the labor market in order to implement practical and effective programs, without losing its distinct academic nature and broader educational mandate.

Fourth, Industrial Revolution 4.0 requires to change training methods with the strong application of information technology, digital technology and networking. Forms of online training, virtual training, simulation, and digitalization of lectures should be brought in gradually, replacing traditional classrooms with many disadvantages. This creates great pressure for the school to prepare teaching resources, especially teaching staff, and building learning spaces.

The near-endless possibilities of the Internet have gradually transformed training from "teaching" to "coaching". This also motivates the teaching staff to build more practical lectures to guide students in order to solve specific situations in life, contributing to increase of the application of the subject.

Fifth, it is necessary to upgrade the school facilities. E.g, building a 5D lab with professional practice modules or building specialized knowledge management through an internal data warehouse such as combining with technology and software management units to provide comprehensive basic and specialized knowledge for each training industry. Managing the vast data of humanity should be focused on cooperating with other units in the country and around the world to control, prevent and develop knowledge, giving lecturer and students the smartest choice with knowledge sources.

Developing technology at low cost is a favorable condition for the University to invest in modern facilities, tools and teaching facilities. In addition to direct teaching to learners, the school also organizes more forms of training such as online training, designing a virtual environment for learners and teachers to interact with each other and communicate information, organize practice in a laboratory or virtual simulation room. It is pivot to use computer systems and big data to design programs and organize teaching for each bject in the most effective way. The online learning system is more and more popular. The online system collects data for each individual. When accumulating a sufficient amount of data about individual learners (length of study, methods, training route, level of interaction, and learning results). Machine learning algorithms will offer the best educational method for each student with a roadmap to optimize personalized learning methods that even the best teachers can hardly offer.

4. Conclusion

Thu Dau Mot University is a multidisciplinary training school, which has established a quick access to Industrial Revolution 4.0. In order to successfully approach this revolution, we needs to implement measures for reviewing, equipping with facilities as

well as training for managers and lecturers to innovate the method of class in the direction of education 4.0 in order to connect and support cooperation with other units.

To get the best results from the above proposals, it is necessary to put the synchronized efforts of managers, students and teachers with the goal of early and fast access to the Industrial Revolution 4.0.

References

- Meire B, Van Cuong, N. (2014). *Lí luận dạy học hiện đại* [Modern teaching theory]. Pedagogical University Publishing House.
- Ministry of Education and Training (2017). *Regarding the task of training human resources capable of adapting to the industrial revolution 4.0*. Official Letter No. 1891/ BGDĐT-GDĐH. May 5, 2017.
- Prime Minister (2017). *On strengthening the capacity to approach the Industrial Revolution 4.0*. Directive No. 16/CT- TTg (2017). May 4, 2017.
- Thanh Phong, H. (2018). *Education in Vietnam in the context of the Industrial Revolution 4.0*. Workshop on Industrial Revolution 4.0 and Education. International University – National University of Ho Chi Minh City.
- Skilton, M. & Hovsepian, F. (2018). *The 4th Industrial Revolution Impact*. New York: Palgrave Macmilla.