

## Intellectuals in Universities in Vietnam In the Context of Industrial Revolution 4.0

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### Abstract:

Under the influence of the Industrial Revolution 4.0, the team of intellectuals in universities has undergone positive changes thanks to their effective use of the achievements and opportunities brought about by this revolution. However, they also face many difficulties and challenges that need to be overcome in order to promote their role and position. Based on this reality, within the scope of this article, the authors will clarify the following basic contents: Firstly, the characteristics of the team of intellectuals in universities in Vietnam; Secondly, an overview of the Industrial Revolution 4.0; Thirdly, the opportunities and challenges for the team of intellectuals in universities in Vietnam in the context of the Industrial Revolution 4.0.

**Keywords:** University, Intellectuals, University Intellectuals, Higher Education, Industrial Revolution 4.0

### 1. Preamble:

The team of intellectuals in universities is an important part of the intellectuals who contribute to training high-quality human resources to meet the requirements of rapid and sustainable national development. Building and developing the team of intellectuals is the direct driving force to raise the intelligence and strength of the nation in the new era. Recognizing the position and role of the team of intellectuals, the Communist Party of Vietnam has affirmed: "Building a comprehensive strong team of intellectuals is an investment in building and nurturing "national vitality" and sustainable development" [11]. The viewpoint of the Communist Party of Vietnam has shown a new way of thinking and a strategic vision for building and promoting the role of the team of intellectuals to

create the driving force to realize the aspiration for a prosperous and happy country. It is also the basis for the authors to analyze and approach the issue of the team of intellectuals in universities, one of the important parts that directly creates high-quality human resources to serve the cause of industrialization and modernization of the country in the context of the current Industrial Revolution 4.0. This article is also the research product of the ministerial-level science and technology project with code MS. B2024.XDA.01.

### 2. Research Methodology:

To elucidate the research problem, the authors employ research methods from specific disciplines such as philosophy, political science, and

sociology, in conjunction with interdisciplinary research methods from the social sciences. The authors also inherit and utilize secondary information and research results from previous studies on the university intellectual team in Vietnam. Simultaneously, specific research methods are employed, such as: logic-historical method, analysis, synthesis, statistics, comparison methods, and other methods, to clarify the research problem.

### **3. Research Results:**

#### **3.1. Characteristics of the Team of Intellectuals in Universities in Vietnam:**

In the context of the Industrial Revolution 4.0, the role of the Vietnamese intellectual team in general and the university intellectual team in particular is always the vanguard force in researching, transferring, and applying the achievements of this revolution to social life. The intellectual team at universities is a typical part of the country's intellectuals, including intellectual, creative, dynamic, research and application workers, mainly teaching staff, research and management teams in universities [7, 54-55]. Operating in the field of education and training, the team of intellectuals in universities has the task of disseminating knowledge, researching, and applying science to practice, in order to contribute to raising the level of education, developing human resources, and nurturing talents. Basically, they are teaching, management, and scientific research staff in the system of universities to train high-quality human resources for the country; they are the direct force participating in training the highest level of the national education system.

Since the majority of the intellectual team in universities are lecturers who do teaching and scientific research work, they are often associated with a specific field, specialization, or profession. The Resolution of the 4<sup>th</sup> Politburo (1979) affirmed: "Lecturers in universities and professional schools must be representatives of the socialist intellectual class" [2, 37]. Therefore, the team of intellectuals in universities has all the characteristics of the country's intellectuals, and at the same time has some of its own characteristics [7, 58-74]:

#### ***\* Intellectuals in universities have high levels of education and are sensitive to political and social issues***

Intellectuals in universities are those who directly participate in the teaching process at the undergraduate and graduate levels (this is the highest level in the national education system). Therefore, intellectuals in universities must meet high requirements in terms of educational and professional qualifications to participate in training human resources and building a team of experts and scientists. The intellectual team at Vietnamese universities today not only has increasingly higher qualifications but is also very dynamic and sensitive in all fields of teaching and scientific research, is also very active in the market economy. They have the ability to research, apply, and transfer the results of their scientific research into life. Some intellectuals in universities also participate in cooperation projects with domestic and foreign enterprises to both improve their expertise and careers and increase their income to improve their lives.

In addition, the intellectuals in universities are sensitive people who have quick access to socio-political issues, therefore they reacted strongly, fighting resolutely and uncompromisingly to protect righteousness and truth. They often frankly express personal opinions on new socio-political issues, "are truth-tellers, uncompromising critics of what exists. Uncompromising in the sense that they do not back down from their own conclusions, or conflict with power, no matter what power "[15, 63].

#### ***\* Intellectuals in universities often associate teaching activities with scientific research***

Participating in teaching and scientific research are two parallel tasks of the majority of intellectuals in universities. Compared to intellectuals who are teachers at other educational levels, the competency requirements for this team are higher, not only to transmit knowledge but also to create new knowledge, not only is teaching but also must be associated with scientific research as an indispensable requirement. Ultimately, the results

of scientific research activities directly serve teaching purposes. Therefore, every intellectual at universities not only has the capacity and qualities of a lecturer but must also be associated with scientific research. They are people who have the ability to organize, operate, and manage the cognitive process of learners through teaching activities, and must continuously research and deploy scientific ideas, orient and help learners have the ability to independently explore and create new knowledge. Resolution of the 8<sup>th</sup> Plenum of the 11<sup>th</sup> Central Committee of the Communist Party of Vietnam requires fundamental and comprehensive reform of education and training, which requires university lecturers to be more than just teachers but also a scientist.\* ***The team of intellectuals in universities has many changes in quantity and quality and regularly has access to modern domestic and world achievements, science and technology.***

In the Resolution of the 8<sup>th</sup> Conference of the 13<sup>th</sup> Central Executive Committee, our party affirmed: "The Vietnamese intellectual team has developed in both quantity and quality; is a leading force in research, innovation, application of science and technology, and international integration; is given attention to training, fostering, investing in resources, facilities, and creating a favorable working environment. Many scientific, technological, cultural, literary and artistic works and products of high value by intellectuals make an important contribution to the process of industrialization and modernization of the country and the cause of building and defending the Fatherland. A part of the intellectuals has capabilities and qualifications approaching those of advanced countries in the region and the world[6].

In recent years, higher education institutions have increased the number of lecturers to meet the scale of training. According to a survey by the General Statistics Office from 2015 to 2020, the teaching staff at higher education institutions increased in both quantity and quality. Regarding the size of public university lecturers, in 2015 there were about 55,401 people. By 2020, the teaching staff increased to 58,338 lecturers (an increase of

5.03%). Thus, on average each year the number of lecturers increases by nearly 600 lecturers [16]. In addition, most higher education institutions have increased the number and quality of lecturers to meet the scale of training, as well as the opening of industry codes. Specifically, in 2015, the whole country had 78.52% of lecturers with post-graduate degrees and 21.41% of lecturers with bachelor's degrees. By 2021, the number of lecturers with post-graduate degrees will be 92.64%, and the number of lecturers with bachelor's degrees will remain 7.36% [17].

The positive changes of intellectuals at universities have contributed to creating important pushes to improve the quality of human resources, promote the transfer and application of science and technology to production activities and social life in Vietnam in the context of the explosion of scientific and technical revolutions and modern technology.

\* ***The team of intellectuals in universities is striving to improve in all aspects to meet the requirements for training resources and educational innovation in the new period.***

The process of restructuring the economy in Vietnam follows the orientation of "transforming the growth model from mainly extensive development to reasonable development between breadth and depth, both expanding scale and focusing on improving the economy" [4, 191] has created an inevitable need for high-quality human resources. That leads to increasingly high demands on intellectuals at universities in terms of both quantity and quality.

If in the past, natural resources played the role of the main raw material and major input of the production process, now knowledge, science and technology are considered the decisive factors for socio-economic development. Therefore, to meet those requirements, we must prepare high-quality resources equipped with in-depth knowledge, work professionally, proactively, think independently and creatively, and adapt quickly to market changes. Therefore, Vietnamese higher education realizes that its mission must inevitably change

fundamentally, comprehensively and strongly in response to the need to develop high-quality human resources to serve the cause of industrialization and modernization of the country.

### 3.2. Some general outlines of the Industrial Revolution 4.0

The Industrial Revolution is a leap in industrial development leading to major economic, cultural and social changes on a global scale. In the history of human society to date, there have been four industrial revolutions, each revolution is characterized by a change in the nature of production; this change is brought about by scientific and technological breakthroughs. At the beginning of the 21<sup>st</sup> century, "*Industry 4.0*" began to emerge from a German government report referring to a high-tech strategy, computerizing the manufacturing industry, without the need for human participation [19 , 6]. This is called the digital revolution, through technologies such as Internet of Things (IoT), artificial intelligence (AI), virtual reality (VR), Augmented Reality (AR), social networks, cloud computing, mobile, Analysis of Big Data (SMAC)... to transform the entire real world into a digital world.

It can be seen that the Industrial Revolution 4.0 (Fourth Industrial Revolution) is the most intense revolution ever, significantly impacting various aspects of social life both broadly and deeply. It represents a trend where production is nearly automated based on data exchange. With the emergence of intelligent machines and robots with artificial intelligence, capable of working, thinking, and making decisions autonomously, performing sophisticated tasks currently handled by humans. The introduction of robots brings numerous applications to society. Thanks to AI technology, robots work increasingly smarter, with boundless capabilities for memory and learning, whereas these capabilities in humans weaken with age. Particularly in the field of education, virtual reality technology will change the way teaching and learning are conducted...

The Industrial Revolution 4.0 is unfolding in three main areas: *physical, digital, and biological*

*technologies*. In the physical domain, Industrial Revolution 4.0 is advancing with new-generation robots, 3D printer, self-driving vehicles, new materials (such as graphene, skyrmions...), and nanotechnology. In the digital domain, the core elements of digital technology in Industry 4.0 are artificial intelligence (AI), the Internet of Things (IoT), and Big Data. In the biological domain, the Industrial Revolution 4.0 focuses on research to make leaps in agriculture, aquaculture, medicine, food processing, environmental protection, renewable energy, chemistry, and materials.

The Industrial Revolution 4.0 is in full swing in developed countries like the United States, Europe, and parts of Asia. While it presents new opportunities, it also poses significant challenges to humanity. Despite the potential challenges and daunting risks, all nations and peoples are striving to seize the attractive opportunities it offers. This is the inevitable law of dynamics in the globalizing trend, and any nation that chooses to stand on the sidelines will face the risk of falling further behind.

Thus, the Industrial Revolution 4.0 is characterized by the integration of all intelligent technologies, with core elements being artificial intelligence (AI), the Internet of Things (IoT), and Big Data. It utilizes AI to control and optimize production processes. The convergence of these technological factors and their interactions has blurred the boundaries between the physical, digital, and biological realms. Consequently, the speed and scope of this revolution's impact are immense.

In Vietnam, the Party and the State have fully recognized the irreversible impacts of the revolution on all aspects of social life. Consequently, the Party has advocated for "accelerating national digital transformation; development of the digital economy based on science, technology, and innovation" [5, 115], while also promoting "creative startups and developing industries, sectors, and enterprises on the foundation of robust application of scientific and technological achievements, especially the Fourth Industrial Revolution" [5, 121]. From a historical perspective, "there has never been a time as full of promise and yet so fraught with peril" [9, 14]. Therefore, a clear understanding of the opportunities and challenges presented by this

revolution will empower Vietnam to harness its advancements to propel socio-economic development now and in the future. Especially in a context where "knowledge" has become a "main economic resource of competitive economic advantage"[12, 54-62], the team of intellectuals in universities plays an even more important role in improving the quality of human resources, especially high-quality human resources in each country.

### **3.3. Opportunities and Challenges for the team of intellectuals in Vietnamese universities in the Context of the Industrial Revolution 4.0.**

#### **\* Opportunities for intellectuals in Vietnamese universities today in the context of the Industrial Revolution 4.0.**

The Industrial Revolution 4.0 with its characteristics has created many opportunities for intellectuals in universities to access smart technologies and acquire the most new, progressive and modern knowledge of the humanity to improve the quality of teaching and promote scientific research activities. Human resource training activities in universities also have revolutionary changes in terms of content, methods and organization. The implementation of scientific research, discoveries, and inventions is also supported by many modern software tools, without wasting travel time or expensive costs. It can be seen that the Industrial Revolution 4.0 brings intellectuals in current Vietnamese universities the following basic opportunities:

*Firstly, the Industrial Revolution 4.0 brings opportunities to improve qualifications and professional capacity for intellectuals in universities.* From the achievements of the Industrial Revolution 4.0, Vietnamese higher education has the opportunity to absorb the experiences and achievements of modern education systems in the world. Therefore, lecturers in higher education institutions can apply the experiences and achievements of science and technology to improve their qualifications and professional capacity through support tools such as: artificial intelligence (AI), GPT chat, connection system, management with smart tools to help lecturers have more opportunities and

favorable conditions to improve their qualifications and promote scientific research, transfer and application of achievements of the Industrial Revolution 4.0 in life.

The impacts of the Industrial Revolution 4.0 not only play a role in guiding and inspiring the innovation of the intellectual mindset but also generate the necessary human and material resources, contributing to the enhancement of skills and expertise to meet the increasing demands of educational and training activities. It is evident that the qualifications, capabilities, and qualities of the academic staff in higher education institutions are the decisive factors in realizing the objectives of Vietnamese higher education, which include "training human resources, raising people's intellectual standards, fostering talents; conducting scientific research and technology to create new knowledge and products, serving the requirements of economic and social development, ensuring national defense, security, and international integration"[13]. In fulfilling its goals and mission, Vietnamese higher education has made rapid progress in recent years, initially meeting some of the requirements of innovation and international integration process.

*Secondly, the Industrial Revolution 4.0 brings opportunities to apply new technologies in teaching to enhance the quality of education and human resources.* The Industrial Revolution 4.0 significantly changes the content, methods, and approaches to teaching and scientific research, particularly in fields related to engineering, military, and manufacturing. The Industrial Revolution 4.0 helps intellectuals in universities with favorable conditions to update the latest information in lectures and training programs, adjust the content, and adapt teaching methods to train a workforce that is skilled and able to quickly adapt to the changes of the new era. Application of new technologies in teaching to improve the quality of human resources helps Vietnam participate in globalization effectively, minimizing the negative impacts and risks associated with it. The increasing integration of technology, especially information and communication

technology, into all aspects of social life is fundamentally and comprehensively changing the way we live, work, and interact, while also promoting the digital transformation in education and training. In the context of global integration, higher education in Vietnam cannot ignore the global trend and must act promptly to seize the opportunities presented by the Industrial Revolution 4.0.

The surge of IoT, Big Data, AI, and SMAC (Social, Mobile, Analytics, Cloud) technologies is shaping the landscape of digital education. As a result, numerous intelligent education models are emerging, built on a foundation of information technology applications. These models effectively support personalized learning, facilitate rapid and effortless access to a vast repository of knowledge on the internet, and enable near-instantaneous interaction between families, schools, teachers, and students (Resolution 52-NQ/TW dated September 27, 2019 of the Politburo) [10]. Virtual classrooms, virtual teachers, simulated virtual devices, and digitized lectures shared through platforms like Facebook, YouTube, Grab, Uber, etc., will become prevalent trends in university education in the coming years, powerfully supporting the teaching endeavors of lecturers. Consequently, students will have ample opportunities to access, accumulate, and stay updated on the latest knowledge, skills, and research across all disciplines, transforming them into global citizens equipped to thrive in creative and highly competitive environments.

*Thirdly, there is the opportunity to enhance the effectiveness of research and the transfer of scientific and technological applications from university intellectuals to real life.* The achievements of the Industrial Revolution 4.0 help university intellectuals quickly connect with students and partners to implement research activities and transfer scientific and technological products into everyday life. Firstly, to strengthen the connection between higher education and production activities, the use of big data to link society, educational institutions, intellectuals (managers, lecturers, scientists), and students is essential. This serves as a springboard for

university intellectuals to leverage other achievements of the Industrial Revolution 4.0 to enhance the application of scientific research results. Specifically, simulation (or virtual reality) allows university intellectuals to test research projects, inventions, and innovations in a virtual environment, evaluating and setting up machinery for subsequent production before making real-world adjustments. This reduces travel time, equipment installation costs, and product quality improvements. The Internet of Things (IoT) is one of the standout features of Industrial Revolution 4.0. In other words, devices in the 4.0 era can connect with each other through connection applications such as Wi-Fi, 3G, 4G, 5G, Bluetooth, or more advanced future technologies. This interconnectivity allows many devices to communicate and interact with each other. Everything becoming smart and connected significantly changes behavior, thinking, life perspectives, business views, and the ways people interact with each other. It also facilitates decentralized analysis and decision-making from anywhere, in any manner, allowing timely feedback and shortening the time to apply scientific research to real life.

Intellectuals themselves, when participating in scientific research, can easily access rich and convenient documents, and learners can also easily actively access information and data. The connection between intellectual individuals in universities, even universities and enterprises becomes easier and faster. This integration or convergence activity is linked and connected through software applications, virtual assistant applications, and real-time three-dimensional screen interaction space with supporting hardware devices (3D projectors, 3D glasses, 3D sound...) that can work remotely without any difference from being in person. This helps save time, costs, increase human creativity and change the way of working and interacting between lecturers and students, between universities and enterprises...

Thus, the Industrial Revolution 4.0 has brought many opportunities for intellectuals in universities. Effectively taking advantage of these opportunities

helps them fulfill their role as pillars of the social production force. The intellectual community in Vietnam, in general, and university intellectuals, in particular, are experiencing significant quantitative and qualitative transformations. They have many favorable conditions to enhance their capabilities and social status. Vietnamese intellectuals are increasingly involved in all aspects of economic and social life, playing a core, pioneering role, asserting themselves, and becoming a representative force for the nation's intelligence and strength. They are a team that produces high-quality human resources to meet the country's development needs. The Party and the State of Vietnam always value and create all conditions for intellectuals, including those in universities, to develop and contribute more to the cause of building and defending the Fatherland.

#### **\*Challenges for intellectuals in Vietnamese Universities Today**

Alongside opportunities and advantages, the Industrial Revolution 4.0 also presents many difficulties and challenges for intellectuals in Vietnamese universities. Some of the key challenges that they face in the Industrial Revolution 4.0 include:

*Firstly, the challenge of improving the quality of human resources in the context of Industrial Revolution 4.0 to serve the cause of industrialization, modernization, and international integration.* The impact of the Industrial Revolution 4.0 is inevitable, objectively irreversible, so to promote its achievements, the quality of human resources must be improved. Intellectuals in universities are mainly involved in teaching and scientific research activities, they are the ones with leading positions and roles in improving the quality of human resources. Only when human resources are of high quality can Vietnam take full advantage of the opportunities and achievements that this revolution brings.

Recognizing the matter, the Party and State of Vietnam have affirmed that the development of human resources, especially high-quality human resources, is a critical breakthrough in the strategy

for socio-economic development. However, the reality in Vietnam shows that the quality of human resources remains very low: "The proportion of laborers with training certificates or diplomas was only 27% in 2023. By the end of 2023, there were still 38.0 million laborers without any formal training" [18]. In the context of the Industrial Revolution 4.0, this statistic highlights a significant challenge for intellectuals in improving the quality of human resources. Therefore, an urgent requirement for universities in general, and the role of intellectuals in particular, is to develop training programs and plans to enhance the quality of human resources. Additionally, if Vietnam does not want to lag far behind developed countries, it must focus on developing high-quality human resources capable of competing in the increasingly deep context of globalization and internationalization.

*Secondly, the challenge of applying the achievements of the Industrial Revolution 4.0 to teaching and scientific research.* Although based on the foundation of previous revolutions, the Industrial Revolution 4.0 has made great strides in speed and scope of impact, systematicity, automation and technology content. Therefore, for intellectuals in universities to apply the achievements of this revolution, first of all, they must not only be highly qualified and professionally qualified but also have extensive knowledge in many fields, and have the ability to select and apply the achievements of this revolution into teaching and scientific research. Meanwhile, university intellectuals often work in many fields, expertise, and occupations, so they have different knowledge bases when approaching new achievements of scientific, technical and technological revolutions. Therefore, this can be considered a significant challenge for lecturers in higher education institutions. Besides, the necessary conditions in terms of material, spirit, mechanisms, policies, and human resources... for the development of human resources, the slow preparation of the above conditions will be a very big challenge for promoting the application of achievements of the Industrial Revolution 4.0 into

the practical activities of intellectuals in universities.

*Thirdly, the challenge facing university intellectuals is to quickly adapt to the changes of the Industrial Revolution 4.0.* This revolution has been and will continue to take place in the coming years, each of its stages has different changes, especially the rapid changes in science, engineering, and technology... creating requirements for timely adaptation to these changes. Therefore, in this revolution, intellectuals in universities must regularly cultivate and accumulate knowledge to meet the regulatory requirements of knowledge, skills and qualities of the new era. ... First of all, they must meet the requirements for professional qualifications. According to statistics in 2019, the full-time lecturers in 237 universities in Vietnam is 73,312 lecturers, with 21,106 lecturers with doctoral degrees, 519 professors, 4,139 associate professors, and 44,705 lecturers with bachelor's degrees [1]. Thus, the proportion of lecturers with doctoral degrees (accounting for 28.7%), and the proportion of professors and associate professors is still quite modest. Compared to the requirements for developing human resources, especially high-quality human resources, it is clear that the intellectual team in Vietnamese universities today still has limitations in both quantity and quality.

Under the impact of globalization and the Industrial Revolution 4.0, the amount of knowledge created by humans is becoming increasingly immense. The list of training fields and specializations is constantly adjusted and updated, with numerous old fields and specializations being replaced by new ones. The intellectual workforce in universities needs to swiftly adapt to the continuous changes of the era. To access and utilize the supportive tools and the vast knowledge resources of humanity for teaching and scientific research, the university intellectual workforce also needs to have a certain level of foreign language proficiency and the ability to effectively use and exploit information technology. This enables them to proactively research materials and interact with other lecturers using computers or smartphones at any time.

According to studies by educational scientists

around the world, there are currently over 200 supportive tools that can be applied in the teaching and research process. By applying AI, Big Data, and IoT technologies, lecturers can collect data, analyze, and accurately assess learners; monitor the learning process at home, check the completion of assignments, and quickly notify students and their families of academic results [8]. Thus, the challenge for the intellectual workforce in universities is to overcome the barriers of language and information technology to freely create in their professional activities.

#### **4. Conclusion:**

Under the impact of the Industrial Revolution 4.0, the intellectual workforce, particularly those in universities, has shown many positive changes in recent years. The Party's orientations towards developing the intellectual workforce are increasingly perfected, reflecting the integration of Vietnamese intellectuals with the global community. Emphasizing the role of this workforce in training high-quality human resources to meet socio-economic development, and in advising, building and consulting on policies for the Party and the State, has received special attention. The intellectuals have rapidly approached issues related to the market economy, social democracy, and the Industrial Revolution 4.0. However, compared to practical requirements, the intellectual workforce in universities still faces many challenges, difficulties, and obstacles, and their quality has not yet met practical demands. Therefore, it is necessary to propose and recommend solutions regarding the regime and policies for the intellectual workforce in universities to ensure they can dedicate, innovate, and develop, take full advantage of opportunities and overcome the challenges posed by the Industrial Revolution 4.0.

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