

Factors affecting the development of science and technology in Vietnam: The Case Study from Ho Chi Minh City

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Abstract

In today's era, science and technology is a component that plays a very important role in the socio-economic development of each country or nation. The process of international integration in Vietnam in general and Ho Chi Minh City in particular, science and technology make an important contribution to transforming the growth model from breadth to depth, improving productivity, quality, efficiency, and competitiveness of the economy, thereby increasing incomes and improving living standards for all people and ensuring national defense and security. However, science and technology in Ho Chi Minh City currently have many shortcomings such as not becoming the leading driving force in the development process, scientific and technological capacity, and innovation still being limited, there are few innovation activities and research and development in the business sector, etc. Many factors that create opportunities and pose challenges currently affect science and technology development in Ho Chi Minh City. Therefore, the urgent issue now is to fully and deeply identify and have reasonable strategies, take advantage of opportunities, and overcome threats to promote the role of science and technology. Technology has important theoretical and practical significance. The article is done by qualitative method with analytical, synthesis, and historical methods for presentation and analysis.

Keywords: science and technology, socio-economic, Ho Chi Minh City, Vietnam

Introduction

Ho Chi Minh City has a stable economic growth rate, gross regional domestic product (GRDP) increases at an average of 8.3%/year, and the city's GRDP scale in 2020 is estimated to account for 22.2% of the national economic GDP and 27% of the total national budget revenue (Ho Chi Minh City Party Committee, 2020, p.73). Ho Chi Minh City has increased investment in the science and technology development budget, which has made a leading contribution, not only to turn Ho Chi Minh City into a civilized and modern city but also to "making important contributions to great achievements of historical significance, changing the face of the country and the city after 35 years of renovation, integration and development" (Ho Chi Minh City Party Committee, 2020, p.76). However, the achievements of science and technology in Ho Chi Minh City today have not met the requirements of socio-economic development commented: "The effective linkage between enterprises, science, training, and the State is not high, so innovation in technology and products and development of high-quality human resources is still slow" (Ho Chi Minh City Party Committee, 2020, p. 102-103).

In the socio-economic development strategy of Ho Chi Minh City, it is determined: By 2025: To be a smart city, a modern service and industrial city, maintaining the leading role in the economy, growth engine of the Southern Key Economic Zone and the whole country, leading in innovation, having a good quality of life, civilization, modernity, and gratitude. GRDP per capita reached 8,500 USD; by 2030: To be a modern industrial, service, and cultural

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city, a leader in the digital economy and digital society, with a per capita GRDP of about 13,000 USD, an economic and financial center, trade, science - technology and culture of Southeast Asia; Vision to 2045: To become Asia's economic and financial center with sustainable development, high quality of life, GRDP per capita of about 37,000 USD, an attractive global destination (Ho Chi Minh City Party Committee, 2020, p.164).

To overcome the above limitations and fulfill the specific development goals of Ho Chi Minh City, it is necessary to clarify practically the factors affecting the development of science and technology in Ho Chi Minh City, then propose solutions to promote the role of science and technology is very necessary and urgent.

Literature Review

Regarding the topic of the article, there are typical works. There are much research works worldwide on the role of science-technology and the impact of the fourth industrial revolution, typically: Rajendra Prasad's (1974), "Science and Technology: Impact on Society". World Economic Forum (2016), "The Future of Jobs: Employment, Skills, and Workforce strategy for the Fourth Industrial"; Richard Works (2017) "The impact of technology on labor markets"; World Trade Report (2017) "Impact of technology labor a market outcome"; Joel Mokyr (2018), "Technology and science reinforce each other to take the global economy ever higher", the content of the research talks about the impact of science - technology, especially the impact of the fourth industrial revolution on employment and wages in the period of technological development, the impact of technology on job skills and tasks, technology and the future of work, studies show that technological advances can help workers, can also replace labor, labor needs High-quality labor is increased, unskilled labor is reduced, machinery is more interested in the development process, especially computers, thereby, changing wages.

In "Science and Technology development in Vietnam: Current Situation and Solutions", the authors argued that: Science and technology play an important role in transforming growth models, and improving productivity, quality, efficiency, and competitiveness of the economy. This is a matter of vital significance to the existence and development of the country and is an urgent requirement of the current industrialization, modernization, and national integration in Vietnam. During 35 years of industrialization, modernization, and international integration (1986 – 2021), science and technology in Vietnam have made important progress in all aspects, making a practical contribution to economic development - society, improving the quality of people's lives, and consolidating national defense and security. However, science and technology in Vietnam today still have many shortcomings such as the level of science and technology in social production remains low and backward compared to other countries in the region; low labor productivity; domestic businesses are still less interested in investing in research and development; investment in science and technology activities is low, the structure is not suitable, efficiency is low; the contingent of science and technology staff lacks quantity, is weak in quality, and the structure is not suitable. These shortcomings have been affecting the demand for reform of an economic growth model to meet the requirements of rapid and sustainable development. In the coming time, to overcome the above problems, Vietnam needs to deploy a synchronous system of solutions (Vu&Tri, 2021).

"Science and technology with the process of industrialization and modernization in Ho Chi Minh City today" has outlined very specific points about the role of science and technology in the process of industrialization and modernization in general and in Ho Chi Minh City. in

particular. The author came to affirm that science and technology are the foundation and driving force for economic development, the development of socio-cultural life, and the foundation for perfecting the political system. Ho Chi Minh City, science and technology are the driving force of industrialization and modernization, such as the development of technology and communication infrastructure; modernizing technology, developing of high-quality human resources, transforming the economic structure towards modernity, protecting the natural environment, and developing sustainably.

Appreciating the role of high-quality human resources, the Ho Chi Minh City Party Committee (2016) issued: Action Program No. 19-CTrHD/TU, dated October 31, 2016, of Ho Chi Minh City Party Committee Ho Chi Minh City on the implementation of the Resolution of the 10th City Party Congress: "On the program to improve the quality of human resources for the period 2016 - 2020". This action program aims to improve the quality of human resources of Ho Chi Minh City in many fields such as Politics, health, education, culture - art, vocational training, and fostering the entrepreneurial team. The City Party Committee has set forth specific programs for each industry, especially those that play an important role to contribute to the development of high-quality human resources in the City, the ultimate aim is to build, modern city development.

"Human resource development about current economic restructuring, international integration and sustainable development (with the reality of Ho Chi Minh City)", the main content of the author talks about the role of human resources, which there are specific contents such as: restructuring the economy in association with renovating the growth model and developing human resources, by changing the growth model, taking sustainable human development as the center, and high-quality human resources as a breakthrough; several issues posed in human resource development such as labor and employment, how can human resources be competitive, workers need to add new skills; human resource development and economic restructuring have a relationship with each other; To develop human resources, it is necessary to develop training, the author is interested in the quality of education through the development of human thinking capacity and talent development. force for educational innovation. This work provided the author of the thesis with scientific foundations and practical human resource development in Ho Chi Minh City (Tri, 2021). The study "Renovating Higher Education in Vietnam: A Case Ho Chi Minh City" wrote: Universities act as a pillar in the innovation system of countries, through missions such as providing human resources, promoting scientific and technical progress, transferring knowledge, and new technologies and providing entrepreneurship and innovation skills... Many researchers believe that higher education has contributed to the nation's contribution to development of high-quality human resources to meet the requirements of the association's international import. However, higher education in Vietnam currently still has limitations such as outdated content and teaching methods, high-quality human resources that do not meet the requirements of international integration, and technology from schools to universities production, business, and social organizations through technology transfer are still low (Tri et al., 2022).

In summary, many works have been mentioned through the research situation related to the topic showingsocioeconomic-science-technology in socio-economic development. But that research is still not in-depth and not systematic. However, the above results are still valuable sources for us to inherit and develop the system, deepening the theoretical and practical issues in the article.

Research Methods

The development history of human society has proven the role of science and technology, when there is a change, their development makes the social production mode change along with that process is the change in the level of workers. In the production process, we must admit that labor tools are an indispensable and important factor, a measure of a human level, and their role has left its mark on every step of the way socio-historical. Marx wrote: "The hand-mill gives society a lord, the steam-mill gives society an industrial capitalist" (Marx, & Engels, 1995, vol.4, p. 187), that is, the development of science and technology makes society and people develop accordingly because science and technology are the premises contributing to the development of human resources.

Today, the outstanding development of science and technology has had a strong and direct impact on the quality of human resources, especially high-quality human resources. The concept of the role of science and technology in the development of society, in general, was established by Marx and Engels asserted: "The production of labor is determined by many conditions, among which are: the average level of ingenuity of the worker, the level of development of science and the level of scientific application to science and technological process" (Marx, & Engels, 1993, vol.23, p.69). And "the development of such products is, in the end, always due to the social character of the labor employed, to the division within society, to the development of intellectual labor, especially natural scientists" (Marx, & Engels, 1993, vol.25, p. 133).

Science and technology are intellectual products of people, the results of practical activities, but when formed, science and technology are the bridge to establish a close relationship between people and the world's objective world, helping people explore nature and conquer the universe. If science and technology are slow to develop, it will make the ability to perceive and understand the natural world become limited, people's living needs are not guaranteed, society does not develop, and at the same time, people also failed to develop their level of thinking.

Engineering and technology are the results of applying human knowledge from scientific knowledge to create and modify tools and means for production and other social activities. The traditional means of mechanical labor, which Marx formerly called the skeletal or muscular system of production, have today to a considerable extent given way to the physical, electrochemical, and chemical aspects of production electronics in material processing for automation systems, and control devices with a continuous technological process. The production and application of modern machinery and equipment in the production process both contribute to improving labor productivity and change the nature and content of labor. In turn, the change in the nature and content of labor leads to fundamental changes in the occupational structure - skills of the workforce. Thus, it can be said that the replacement of the role of the human factor is, after all, still determined by the development of science and technology. When people were at a low level, science had a weak impact on technology and production, but when it has developed to a high level like today, it has a strong and direct impact on the production process.

Thanks to the great achievements of the scientific revolution, the development of technologies such as biotechnology, nanotechnology, materials technology, especially information and communication technology, mechanical technology - electronics have made the economic structure more and more perfect, and many new professions have appeared in

research, commerce, services. The development of science and technology has accelerated the process of formation and development of economic restructuring. The economic structure is the proportion of economic sectors in a unified economy, if it is a backward economy, the proportion of the agricultural sector will occupy a high position in the economic structure and vice versa. If the economy develops, the proportion of industries and services will account for a high proportion, or develop agriculture in the direction of industry and services. Human society is in the process of transitioning from industrial civilization to the information age, from an economy based on natural resources to an economy based on knowledge, which has made. The quality of workers is constantly being improved. Thus, the development of science and technology is a condition and a premise for socio-economic development.

The article uses a combination of research methods, such as historical and logical methods, comparison and contrast, analysis and synthesis, induction and inference, and statistical methods from the reference source for research purposes.

Results and Discussions

Factors affecting the development of science and technology in Ho Chi Minh City

Impact of socio-economic. Saigon – Ho Chi Minh City is a young city, just formed more than 300 years, in the process of international integration, the speed and scale of economic growth in Ho Chi Minh City have always maintained a high position compared to other regions of the country. If in the period (1976 - 1985) the average GDP growth rate was 2.7%/year, then in 35 years of renovation, the economic growth rate was always at double digits with the average growth rate of 7 years in the 2016 - 2019 period of 7,7% (Ho Chi Minh City Party Committee, 2020, p.94) and contributed over 22% of the country's economy, 27% of the total national budget revenue, and the city's labor productivity was 2.6 times higher times the national average labor productivity. In the general context of the world and the region, on average in the period 2016 - 2019, Vietnam reached 6.78%, higher than the growth rate of Singapore (2.44%), and Thailand (3.42%). The fast and stable economic growth has led to a continuous increase in GRDP per capita of Ho Chi Minh City over the years, an average of 2.4 times higher than that of the whole country (Ho Chi Minh City Party Committee, 2020, p.24 - 25), the city continues to affirm its position and role as the nucleus of the southern key economic region and the whole country.

Ho Chi Minh City has had an economic restructuring toward becoming more and more modern. The city advocates industrial development, and industrial restructuring to products and industries with high science and technology content and great added value, this is reflected in four industries large industry: Mechanical engineering; electronics, telecommunications; chemical and pharmaceutical industry; food and food processing. Internal economic sectors also have a positive shift: increasing the proportion of products and services with high added value, and high scientific-technical content; reducing labor-intensive industries that cause environmental pollution, and gradually forming high-quality services towards building the city into a center of trade, service, and high-tech industry of the whole country. The characteristics of economic development in the direction of trade and services, it has promoted and facilitated the development of science and technology, it is also an important determinant for economic development. The advancement of science and technology is one of the important causes of economic restructuring toward modernity, in fact, it also promotes the development of high-quality human resources. Ho Chi Minh City is the largest financial-banking center in Vietnam, leading the country in the number of banks and sales of financial-credit relations. The development of the banking and credit system creates financial conditions for businesses,

schools, and research institutes to invest in science and technology development, as well as create conditions for people to access loans, develop loans, and develop loans economic development, to improve people's living standards, have conditions to study, research, and raise their qualifications.

In general, in the process of development and integration, Ho Chi Minh City has always affirmed its role as an economic, financial, commercial, and service center of the whole country; is the nucleus of the southern key economic region, one of the three largest key economic regions in the country, and is also the driving force for socio-economic development in the southern region and the whole country by the national strategy industrialization and modernization strategy.

Political, social, and cultural conditions. Not only focusing on economic growth, to ensure the lives of all people, the city has also increased investment in technical infrastructure and social services to ensure fairness and progress in the development process. The city has focused on directing and operating, speeding up the implementation progress of many large and key projects in the area to promote socio-economic development and solve traffic jams... Regarding education - training, to facilitate the development of science and technology in the City, the City has a developed education system. The city has many great universities, centers, and research institutes, so the number of trained workers is increasing day by day and the quality is getting higher and higher is also a place to attract high-quality labor resources of the whole country. According to the statistics of the City Statistical Office in 2017. The preschool level has 1,208 preschools (both public and non-public), with 24,988 teachers and the number of students at this level is 385,300 students. The upper secondary level has 952 schools (including both public and non-public), with 51,006 teachers and 1,225,041 students. The city has 56 universities, 52 colleges, 64 intermediate schools, 82 vocational education centers, and 346 vocational training establishments. In addition, the city has 100,000 leading teachers, lecturers, experts, and scientists in the field of education and training (report of Ho Chi Minh City Department of Education and Training in 2019). All these successes are important conditions for the development of science and technology in the city because education and training are the reasons for the development of science and technology. High-quality human resources also develop.

In addition to educational development, Ho Chi Minh City is also home to a developed health system. Currently, Ho Chi Minh City has 470 medical facilities (including state-owned, non-state, and foreign-invested sectors). The city has many large universities that train in medicine and pharmacy (led by Ho Chi Minh City University of Medicine and Pharmacy, Pham Ngoc Thach University of Medicine and Pharmacy, and Ho Chi Minh City Medical College, besides. there are also schools from intermediate to university with training in medicine and pharmacy, etc., so the city has attracted many people to study and research medicine and pharmacy, among those who come to study, there are many people who stay in the city for work. In addition, the city also attracts medical and pharmaceutical graduates from many parts of the country as well as abroad to work here, so the number of medical and pharmaceutical staff in the city is quite large and of high quality. The city has many types of research and applications of science and technology in the field of health, to improve the quality of life of the people. In summary, the development of such health has created conditions for high-quality human resources in the medical field to contact and apply advances in science and technology in medical examination and treatment treat diseases, take care of workers' health, and improve people's quality of life, thereby, promoting the development of high-quality human resources, and developing the science and technology in the City.

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Impact of the socialist-oriented market economy and globalization, international integration. First of all, the impact of the market economy. The term "socialist-oriented market economy" was officially used in the Document of the Ninth Party Congress (2001), and the thinking about it has been continuously improved through the congresses. The 12th Party Congress, the concept: "A socialist-oriented market economy is an economy that fully and synchronously operates according to the laws of the market economy while ensuring social orientation appropriate to each stage of the country's development. It is a modern market economy and international integration; under the management of the socialist rule of law state, led by the Communist Party of Vietnam, with the aim of "Rich people, strong country, democracy, justice and civilization" (Communist Party of Vietnam, 2016, p.25-26).

This is the creative application of the law of production relations by the development level of the productive forces and summarizes the revolutionary reality of Vietnam and the world. The socialist-oriented market economy built in our country has the following characteristics: i) The development goal is that of rich people, a strong country, a just, democratic, and civilized society, with a developing productive force that constantly improves people's lives through a system of social security policies; ii) Regarding the direction, to develop a multi-sector commodity economy operating under the market mechanism under the management and regulation of the socialist rule of law state; iii) Regarding distribution orientation, it is mainly based on labor efficiency and economic efficiency; at the same time distributed according to the level of capital contribution and distributed through the social security and social welfare system; iv) Economic development goes hand in hand with cultural and social development and realizes progress and social justice in distribution.

Developing a socialist-oriented market economy in Ho Chi Minh City is also in the flow of the Vietnamese revolution, but with geo-political and historical characteristics in the process of forming and developing the city. Ho Chi Minh City soon had an exchange with the outside world, so it soon formed a market economy, Ho Chi Minh City was formerly just swamps, dense forests, and wilderness, inhabited by residents sparse population. With a system of rivers and canals quite convenient for traveling, the first Vietnamese immigrants crossed the sea to make a living in this land, so the people here have the courage of those who go to explore new lands, work hard, and hard-working. This place soon formed a large center, with a river wharf, a market street, and a crossroads trading with the outside, becoming a strategic stronghold with an important position. Right from the early days, due to the influence of Southern river culture, a trade associated with rivers, canals, and arterial roads to transport rice and other agricultural products and goods from the Mekong Delta to Saigon port for export. The bustling image of trading "on the wharf under the boat" proved that Saigon was the largest trading port at that time. Names such as Ben Binh Dong, Ben Nghe, Ben Thanh, and Ben Nha Rong were born from that and entered the subconscious of most Saigon people, thereby helping Saigon trade and contact the world outside early, creating conditions for the City to absorb technology, human resources, culture easily and effectively. And with the process of bustling exchange and trade, the Saigon people soon became acquainted with trade, a free economic relationship, with a capitalist tendency long before the West arrived in Saigon.

Because the land is large, the people are sparse, and the location is convenient, so the need for economic development, trade promotion, and exchange with the outside is very great, the purchase and sale of goods appeared very soon, and the purchase and sale of goods took place very quickly. This place is also a place of departure for many foreign and Vietnamese merchant ships that bring rice, salt, silk, tortoise, etc. to China, Thailand, Singapore, Indonesia, etc. The Philippines is for sale. Since then, there has appeared an exchange of economic and cultural development between countries, turning this place from a wild land into the center of Southeast Asia. When exchanging economic and cultural development, the City has the opportunity to get early access to the development of world science and technology.

With early access to the market economy, Ho Chi Minh City entered the doi moi period with a dynamic, enterprising, and enterprising type of economic activity, "going ahead of the whole country" and overcoming the government's government old economic system. This has influenced the role of science and technology in the development of high-quality human resources. With the characteristics of a market economy in Vietnam, Ho Chi Minh City has allowed free competition and created conditions to promote production activities, the social division of labor, and economic restructuring. the economy in the direction of modernity,

developing many new industries, and expanding economic exchanges between the city and localities at home and abroad to promote economic development, thereby creating material conditions to promote science and technology development.

In the market economy, the top goal is "profit", economic growth, and economic efficiency, this is completely consistent with the function of the market economy, in line with the division of labor. activities of economic entities, because the function of any business or a manufacturer or business is to seek maximum profit based on the law of value, the law of supply and demand, and the law of competition. When taking profit as a measure, forcing businesses and economic sectors to constantly develop, because businesses want to compete to meet the needs of the market, it requires technological innovation, investment in cutting-edge technology, product innovation, production process innovation, management... to meet the market's requirements, but this innovation is unlimited, so under the influence of the market economy has influenced the position and role of science and technology. Ho Chi Minh City is the locality with the most developed market economy in the country, it is these impacts that have promoted the city's science and technology to develop conditions, thereby, human resources and High quality also grows accordingly.

In the market economy, workers are also subject to fierce competition, skilled, calculating and agile workers will be valued, on the contrary, low-skilled, lazy workers who cannot adapt to the change will be discarded. The market economy is the place to discover, train, recruit and employ workers, improve the level of business management, and the market economy is also the place where poor managers are eliminated. Therefore, workers in one way or another in the market economy must strive to improve themselves, thereby improving their qualifications, which is also the reason for promoting the development of science and technology.

Saigon since the French colonial period, with the advantage of natural location, and historical advantages, is the place to gather and transship many goods from provinces in the country and countries around the world, this place has a lot of goods. Due to the fierce competition between domestic and foreign traders, the process of trade with the world has made Saigon - Ho Chi Minh City a center of commerce and finance. The city is an early place to interact with the outside world, so it also learns to receive a lot of progress from the world, entering the renovation period, the city becomes the leading locality in the country in globalization and international integration in absorbing and using foreign resources (capital, science, and technology, management level, experience, competitiveness...), developing industrial zones, technology zones with a high growth rate and increasing investment, businesses have the opportunity to develop and reach out to the world, promoting the process of technology transfer, thereby promoting economic restructuring towards modernity. When interacting with the world in education and training, the city's healthcare also has the opportunity to develop accordingly.

Second, the impact of globalization and national integration. Globalization, international integration, and knowledge economy is an inevitable trend for the development of the world today and it is happening more and more strongly at a fast speed, its role is being increasingly recognized affirming in promoting economic, cultural, and socio-political exchanges, creates possibilities and opportunities for nations and peoples to develop, as well as creates requirements, motivations, and conditions for improving the level of human resources. Globalization and international integration help countries and localities to well combine national strength with the strength of the world and the times, bringing into play their internal and external forces and all creative potentials, at making

same time, making the most of external resources to serve the development of the country.

The trend of globalization and international integration has fundamentally changed the scale and development of science and technology activities of each country as well as the global scale, thereby, leading to the globalization of human resources global research and development, management, and sharing of global technology research and development. Under the impact of globalization and international integration, the city's science and technology have also changed its research objects, directions, tasks, and scientific research levels. The current level of research and scientific research projects of the City, in addition to serving the city's socioeconomic development needs, must be consistent with the development trend of the world. Therefore, research projects are becoming more and more complex, and the scope of research is increasingly wide, beyond the research scope of a region or country, which requires scientists to exchange and cooperate. Working together to complete, on the one hand, scientists share experience, human resources, and research results, on the other hand, they compete with each other.

Ho Chi Minh City is a leading locality in the country in the process of globalization and international economic integration investment capital, receiving modern technology, increasing the use of labor, training human resources and management skills through production and business activities associated with trade and investment. Thereby, gradually helping the city's science and technology to integrate and exchange with the world, creating favorable conditions for the city to learn from experience and acquire achievements to serve the needs of economic development. The process of globalization and international integration creates conditions to attract investment capital from advanced countries with highly developed science and technology such as the US, Japan, Korea, Singapore, China, etc. participating in joint ventures and associations in science and technology activities with foreign partners to help the city's scientists have the opportunity to access high technology, thereby bridging the gap in knowledge, research, and development skills, as well as improving the individual's scientific creativity. The process of cooperation in training high-level scientific and technological human resources, capable of receiving, transferring, and applying the world's advanced scientific and technological achievements will contribute to improving the capacity, the level of the current team of scientists and develop the team of young scientists and technology to continue the development of the City.

With globalization and international integration, employees working in large enterprises, companies, and corporations have advanced management methods, using modern technology at home and abroad, throughout the working process employees can learn and acquire more skills, management capacity, and working styles, especially the cultures of countries around the world. In addition, through the process of globalization and international integration, employees reveal their limitations, such as low professional qualifications, low skills, lack of foreign language knowledge, and unprofessional working style, compliance with labor discipline is not high, there is no culture of behavior at work, no international working style has been built... through which, employees realize their limitations and shortcomings, want to Integration and development force workers to learn and overcome the above limitations to improve the quality of human resources, so that workers can meet international labor standards. In this process, human resources are fiercely competitive and increasingly fierce. Because, through the process of globalization, the labor source has moved from one place to another, while the quality of labor in the City is not high (although, Ho Chi Minh City is considered a locality. to have a competitive advantage, forcing workers to improve their qualifications and skills if they do not want to be left behind and at a disadvantage in comparison.

Besides the above advantages, the process of globalization and international integration

brings certain difficulties and challenges to the development of science and technology, and high-quality human resources in the City. The city's resources for science and technology development have been invested in and developed, but compared to developed countries with a developed science and technology background, the city faces many difficulties, challenges, and manifestations. Currently, the fierce competition makes the loss and weakness always on our side. The City's technological products are not many and many types of research are not highly applicable, with the rapid development of technology, the world challenges the management system, especially the law on intellectual property. Ho Chi Minh City is prioritized by the Government to develop a specific mechanism but is still subject to the general supervision of the State. Technology transfer between the City and the world is still hindered by cumbersome and complicated legal mechanisms. In particular, the city still lacks a lot of research and development staff, especially leading scientists, when exchanging, researching, and developing science and technology, the city lacks common contributions to the development of science and technology development of the world, or when there is the development of new technology, there is a lack of high-quality human resources to transfer technology and put it into life and production.

Thus, in the socialist-oriented market economy and the impact of globalization and international integration, the role of science and technology on high-quality human resources has important impacts including advantages as well as difficulties and challenges. On the development path of the City, it is necessary to solve these inevitable contradictions to build and develop the City in a green, modern and smart direction.

Impact of the industrial revolution 4.0. The term "the Fourth Industrial Revolution", also known as "industrial revolution 4.0" was first introduced at the Hannover Technology Fair, the Federal Republic of Germany in 2011. In some countries, this revolution is called "Ingress Protection"; "Intelligent manufacturing", or "Digital manufacturing". Although the names are different, the general idea is the same: Future manufacturing brings the virtual world (network) and the real world (machine) closer together. Since then, the term "Industry 4.0" or "Technology 4.0" has been used quite widely around the world to describe the fourth industrial revolution and has recently become a hot topic around the world and attracted almost every country in the world's interest.

Revolution 4.0 affects the research and training activities of science and technology institutions. The 4.0 revolution is called the digital revolution, the characteristic of this revolution is the increasing popularity of artificial intelligence, and automatic machines, bringing a combination of real and virtual systems that strongly affect many fields and aspects of social life, especially high-quality human resources. Education and training in the 4.0 era have many changes, changing methods, content, and programs with many tools, using new technologies (such as Skype, GoToMeeting, Blue jeans; conversational applications. , Microsoft Teams resource sharing; OneNote application; Stream; Reader Analytics application; look up Tflat dictionary; App that supports drawing mindmaps (Mindnode, Simplemind); Wolfram Alpha online service..., use Versatile tools such as computers, projectors, electronic lectures, smart boards, electronic textbooks, virtual technology help learners experience and practice better skills, towards concentration. individualized learning is thorough, this condition facilitates the development of socialization of education. Ho Chi Minh City's success in training high-quality human resources under the impact of the 4.0 revolution needs to raise awareness and renew the thinking of the city's people, and change training models, programs, and methods to accelerate the digital transformation process, anticipate the application of new technologies, change the model of linkage between universities and businesses, improve the quality of teachers and administrators, and strengthen integration and

international cooperation on training.

Under the impact of the 4.0 revolution, the human resources of science and technology in Ho Chi Minh City have changed in both quantity and quality, and some new skills and knowledge workers need to learn more. and additionally, there is a change in the labor market, an increase in high-quality workers, workers in the field of science and technology, a shift in the labor structure, and several industries develop strongly or export new industries to meet the requirements of the revolution (such as artificial intelligence, data analysis, and intelligent ICT convergence) are new industries that are of great interest, leading to training recruitment. The labor market also needs to change, labor market forecasting works more effectively to accurately forecast the future labor demand as well as the labor demand that will be replaced. Stemming from that fact has influenced the city's mechanisms and policies in science and technology development to develop high-quality human resources to meet the development requirements of the 4.0 revolution. Thoroughly grasping Resolution No. 52-NQ/TW of the Politburo on several guidelines and policies to actively participate in the Fourth Industrial Revolution. Ho Chi Minh City has actively invested, developed, and applied the achievements of the 4.0 revolution in building and developing a smart city.

Impact of policies of the State of Vietnam. Today's reality is placing urgent requirements on innovation and technology development, to improve quality, lower product costs, and create competitive advantages in the international market. Aware of this requirement, our Party and State have made many major undertakings and policies to develop technology such as the Resolution of the 2nd Central Committee, term VIII on strategic orientations for science and technology development in the period of industrialization and modernization of tasks until 2000; Strategy for development of science and technology of Vietnam up to 2010; Law on Science and Technology (2013); Decision No. 2686/QD-BKHCN (2015) approving the list of key national science and technology programs for the period 2016-2020; The National Program for High-Tech Development to 2020 and Resolution No. 20-NQ/TW of the Sixth Plenum of the XI Central Committee on Science and Technology Development for the Cause of Industrialization and Modernization socialist-oriented market economy and international integration.

To further develop basic research in our country, on March 24, 2015, the Prime Minister issued Decision No. 380/QD-TTG approving the Physics Development Program until 2020. Most recently, on April 25, 2017, the Prime Minister issued Decision No. 562/QD-TTG approving the Basic Science Development Program in the fields of Chemistry, Life Science, Earth Science, and Marine Science for the period 2017 - 2025. In recent years, the Government and the Ministry of Science and Technology have implemented basic research programs, supported scientific staff, and sponsored many research projects in various industries. Mathematics, Computer and Information Science, Physics, Chemistry, Earth and Environmental Sciences, Agricultural Biology, Biomedical Medicine, Mechanics.

Starting from that, Ho Chi Minh City implements the Party's guidelines and guidelines on science and technology development. The city has the following specific programs: Implement Circular 09/2012 of the Ministry of Science and Technology on the selection and direct assignment of organizations and individuals to assume the prime responsibility for performing state-level humanities and social science research tasks. People's Committee of Ho Chi Minh City (2016), Decision No. 2953/QĐ – People's Committee approving the program of scientific research, technological development, and enhancement of scientific and technological potentials of Ho Chi Minh City in the 2016-2020 period.

Under the impact of the industrial revolution 4.0, along with the requirements of building and developing a Smart City, the City issued Decision No. 1519/QĐ-UBND approving directions, goals, and tasks for science and technology mainly in the period 2016 - 2020 in Ho Chi Minh City. To develop the City, many factors are required, in which high-quality human resources play an important decisive role, therefore, Decision No. 5715/QĐ – UBND (2014): On promulgating implementation regulations pilot several policies to attract science and technology experts. By 2019 it has attracted 17 Vietnamese and foreign experts and knowledge experts, 8 Vietnamese experts residing abroad to participate in scientific and technological activities, up to now, the Experts have contributed over 15 quality scientific works, and 40 scientific articles published in valuable specialized journals. However, the salary and remuneration policy did not attract many experts, so the People's Council issued Resolution No: 20/2018/NQ-Resolution on the income level of experts, scientists, and people with special talents for the field that the City needs to attract in the 2018-2022 period to attract leading experts in fields, the City requires.

In addition to the policy on human resources, the City's research field pays close attention to a specific program of activities to promote the full potential and strengths of science and technology. Specifically, the City launched a program of signing cooperation activities for the period 2017 - 2020 between the Ministry of Science and Technology and the People's Committee of Ho Chi Minh City, the program includes 7 contents. This program shows in many fields demonstrate creativity and take the lead in piloting the application and developing the achievements of science and technology of the City, thereby, developing and replicating the whole country, especially promoting the fields of science and technology, innovation, cooperation programs, joint development of high-tech parks; cooperation, training of high-quality human resources, management, and technology transfer between the parties involved. The cooperation program also studies and proposes investment mechanisms and solutions, upgrading the Ho Chi Minh City Technology Exchange into a national technology exchange; developing the Science and Technology Information Center of the Department of Science and Technology of Ho Chi Minh City into the Southern Science and Technology Information Center. Ho Chi Minh City is considered the leading city in the country in terms of innovative startups, so through the program, there is also a policy to build and develop a creative startup ecosystem in Ho Chi Minh City. "Program to support small and medium-sized enterprises to innovate, improve competitiveness and international integration in the 2016-2020 period", "Program on scientific research, technology development and potential improvement" science and technology in the 2016-2020 period". These programs are very meaningful in the development of science and technology in Ho Chi Minh City, as well as the whole country because this place will be a place to research, apply and develop science and technology to practical application for other localities of the country. For science and technology to develop widely and deeply in life, production and business, the program advocates coordinating the development of equipment and technology innovation programs for businesses in Ho Chi Minh City.

The Party and State's guidelines and policies on the role of science and technology are essential because science and technology are the driving force behind the country's industrialization and modernization process promote economic growth and protect national security. Science and technology play a key role in the development of productive forces; improving production tools to improve productivity, saving and protecting natural resources, and improving human intelligence. Thus, only by properly assessing the role of science and technology can have the right investment policy and promote its effects effectively. When

considering science and technology as the most important driving force for the development of modern productive forces, our Party has affirmed its great role in the development of productive forces, organizational methods management, the social division of labor, and increased labor productivity.

Some solutions to develop science and technology in Ho Chi Minh City

First of all, comprehensively, fully, and deeply perceive the factors affecting science and technology, thereby forecasting and building solutions for science and technology development in Ho Chi Minh City in the future next time; at the same time, Ho Chi Minh City needs to well implement policies to treat, nurture and attract high-quality human resources. Attracting and fostering talent is just as important as training. Ho Chi Minh City needs to develop special policies with preferential working regimes for quality human resources trained at home and abroad, to attract international students returning home to work after graduation industry and encourage highly qualified human resources from developed countries in the world to come to Ho Chi Minh City (Tri, & Thanh, 2022).

Second, to develop a strategy to strongly develop science and technology as a basis for improving productivity, quality, efficiency, and competitiveness of industries, fields, and the whole economy, promoting restructuring economy and renewing the economic growth model, promoting R&D, innovative start-ups, and applications combined with technology development, especially in new potential and strong industries and fields. Renovate and perfect mechanisms and policies to mobilize, allocate and effectively use investment capital for scientific and technological activities. Continue to improve the policy of state budget investment in science and technology activities in the direction of avoiding overlapping and overlapping allocations, avoiding spread investment, and ensuring effective use and strong development of labor resources intelligence, raising people's intelligence, and training talents.

Third, complete the legal corridor for science and technology development. The legal system for science and technology development plays an important role; because this is the basis for science and technology to exercise freedom of labor and creativity within the framework allowed by law. Although, the State has made efforts to amend, supplement and complete the legal framework for science and technology development, the results are still not synchronous and consistent. Therefore, to perfect the legal system and remove barriers and obstacles to science and technology human resources, the State needs to create favorable conditions for the legal environment so that all social actors can participate in science and technology development.

Fourth, complete the strategy and planning for science and technology development. The formulation of science and technology development strategies, master plans, and plans proposed by the State must be associated with socioeconomic development strategies, national security strategies, and other basic national strategies. In particular, focus on the analysis and evaluation of science and technology development forecasts. Forecasting the trend of science and technology development plays an important role because this is an important basis for developing strategies, master plans, and plans. Therefore, it is required that policymakers grasp relevant news and events taking place and; at the same time, accurately predict the possible developments in the future.

Fifth, equipping and investing in material and technical facilities. Ho Chi Minh City needs to increase investment and innovation in modern scientific research equipment for research and experiment rooms at scientific centers, universities, and research institutes; At the same time, it is necessary to develop information systems, modern information equipment,

expand information networks so that all science and technology staff can access, exploit and use scientific and technological resources in their work research. It is necessary to create conditions for scientists to go on training, retraining, study tours, exchange, and cooperation in scientific research in countries with advanced and modern science and technology.

Conclusion

Investment in science and technology is an investment in sustainable development, directly raising the intellectual level and strength of the nation. Promoting the role of science and technology in socio-economic development in Ho Chi Minh City is one of the basic factors reflecting the level and quality of sustainable development. In recent years, the development of science and technology for socioeconomic development has contributed to raising labor productivity, reducing the unemployment rate, and narrowing the gap between the richest and poorest groups' application of information technology in state management. However, science and technology in Ho Chi Minh City pose many challenges that require Ho Chi Minh City to implement the above solutions synchronously to develop science and technology to meet development requirements fast and sustainably today.

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