

Developing high-quality human resources to meet the requirements of rapid and sustainable development: Realities and solutions

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Abstract

The world is undergoing rapid and transformative changes, with high-quality resources playing a pivotal role in driving significant economic and social advancements. Today, the competition among nations and businesses increasingly revolves around intellectual capacity and the knowledge embedded in products, commodities, and services factors that are underpinned by superior human resources. To achieve both swift and sustainable progress, countries globally are prioritizing the development of human resources, recognizing it as a strategic and pressing necessity amidst the backdrop of global economic integration. For Vietnam, developing high-quality human resources is crucial to enhancing its competitive edge and meeting the demands of the modern digital economy. This article delves into the challenges associated with cultivating high-quality human resources needed for rapid and sustainable development. It also offers solutions to nurture these resources in Vietnam for the near future. Theoretical research is conducted from both United Nations and Vietnamese perspectives within the framework of international economic integration. This research provides both theoretical and practical foundations for advancing high-quality human resources to support sustainable development goals in Vietnam.

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1. Introduction

The development of high-quality human resources is a strategic breakthrough and a decisive factor in promoting the development and application of science and technology, restructuring the economy, and transforming the growth model. It is the most crucial competitive advantage, ensuring rapid, efficient, and sustainable development. This issue is vital for the survival and development of the nation and is a pressing requirement for international integration. Currently, there are various perspectives on high-quality human resources, but it can be understood as follows: developing high-quality human resources means enhancing the value of human resources in terms of both quantity and quality of professional skills, political courage, ethical qualities, and integration skills to achieve effective production activities [1]. Comprehensive human resource development should focus on three fundamental aspects: (i) increasing the quantity of human resources; (ii) improving the

quality of human resources; and (iii) enhancing the efficiency of human resource utilization. These aspects are integral to the human resource development process and are key criteria for evaluating human resource development during industrialization, modernization, and international integration [2]. The work "Asian Development Bank, Human Resource Policy and Economic Development: Selected Country Studies" has collected articles by foreign scholars from the Asian Development Bank, the Institute of Development Studies of Bangladesh, Indonesia, the Philippines, Thailand, Seoul University, Korea on issues related to human resource development about economic development such as: population, employment, education - training, health, nutrition, vocational training, human resource use... [3].

The issue of high-quality human resources for economic and social development has drawn international attention, notably the Training Strategy of the G20 countries with the goal of "strong, sustainable, and balanced development" for the workforce, proposed in 2010. This strategy has received positive support from member countries of the Organization for Economic Co-operation and Development (OECD). Experts from various international organizations, regions, and governments have shared their perspectives, experiences, and research results, with significant contributions from institutions such as the Asian Development Bank, the Asia-Pacific Economic Cooperation, the Human Resources Development Task Force, the European Training Foundation, the European Union's expert group on "New Skills for New Jobs" UNESCO, the World Bank, and the International Labor Organization Training Centre in Turin. The key conclusions revolve around the development of skills to enhance productivity, stimulate employment growth, and ensure sustainable development. This includes the readiness of quality education as a crucial foundation for the future education system, the alignment of training with the needs of businesses, continuous workplace training, and lifelong learning to adapt to the rapid pace of change. Additionally, predicting and building future skill needs through collaboration between trainers, employers, and government agencies, utilizing labor market information, employment services, and performance evaluations, are highlighted as crucial steps in identifying necessary skills early on. Ultimately, ensuring widely accessible training opportunities, not only for men but also for women, particularly for at-risk groups such as youth, low-skilled workers, individuals with disabilities, and rural communities, is emphasized [4]. In a related context, Hanushek and Kimko in "Schooling, Labor-force Quality, and the Growth of Nations" noted that studies on the role of human resources in the growth of nations often overlook the quality aspect, implicitly assuming that changes in the quality of the workforce are relatively small compared to the importance and pure changes in the quantity of the labor force. Their research explicitly examined the quality of the labor force through comparative tests of mathematical and scientific skills. A consistent, stable, and robust relationship between the quality of the labor force and economic growth emerged from various technical analysis parameters, emphasizing the significant role of labor force quality in growth, with quality having a causal impact on growth [5].

In the context of Vietnam's ongoing international integration, significant research has been dedicated to the overarching theme of human resources, particularly the cultivation of high-quality individuals and their pivotal role in driving social development. One notable investigation, titled "Education and training with the development of high-quality human resources in our country today" provides a comprehensive exploration of diverse aspects related to nurturing high-quality human resources within the framework of establishing a knowledge-based economy in Vietnam. The study delves into essential areas, including theoretical considerations and practical insights associated with cultivating high-quality human resources aligned with the demands of a knowledge-based economy. Additionally, it assesses the current status of developing high-quality human resources in Vietnam to meet the requirements of a knowledge-based economy [6].

The study titled "Developing High-Quality Human Resources to Meet the Requirements of Economic Growth Model Transformation in the Key Southern Economic Region" underscores the pivotal role of high-quality human resources, emphasizing that this role materializes when workers are equipped with the essential capabilities and qualities necessary to meet the demands of ongoing industrialization and modernization processes, both in the present and the future. The author highlights health as a critical factor for high-quality

human resources, extending beyond the absence of illness to encompass the enhancement of physical and mental well-being. Recognizing the urgency of developing high-quality human resources, the study contends that only such resources can effectively assimilate and apply scientific and technological advancements, incorporate new technologies, and optimally utilize other resources. In the pursuit of developing high-quality human resources, the author delves into the following key aspects: (i) Establishing planning and development strategies for high-quality human resources; (ii) Training high-quality human resources; (iii) Recruiting, retaining, and rewarding high-quality human resources. Building on these foundations, the author provides insights into the current status of developing high-quality human resources in the Key Southern Economic Region and puts forth fundamental solutions to meet the requirements of the region's economic growth model transformation. The article "Enhancing the Quality of Vietnam's Human Resources in the Fourth Industrial Revolution" posits that for countries like Vietnam, which depend heavily on the golden demographic structure for economic growth, improving the quality of human resources is crucial to adapting to new changes. By briefly exploring the theoretical foundations of human resources and their development, this article analyzes Vietnam's policies aimed at enhancing labor quality. Based on this analysis, proposes solutions for Vietnam to elevate the quality of its human resources to keep pace with the Fourth Industrial Revolution [7].

The study "Human Resource Development to Meet the Requirements of Socio-economic Recovery and Development: Current Situation, Problems and Solutions" concluded that after more than 35 years of implementing the renovation process, Vietnam has achieved great achievements in all fields, creating many outstanding marks, in which the economy has grown strongly, becoming one of the fastest growing economies. The material and spiritual life of the people has been constantly improved; health and the quality of health care for the people have been enhanced; national defense and security have been consolidated and stabilized; foreign relations and international integration have become increasingly deep and effective. However, the process of socio-economic development has revealed shortcomings and created great pressure on the ecological environment. The situation of environmental pollution continues to develop complicatedly, the quality of the environment in many places has declined sharply, and there is no longer the ability to receive waste, especially in areas with many concentrated industrial activities; Biodiversity and forest quality are degrading to an alarming level, genetic resources are being lost; drought and saltwater intrusion are increasing causing serious consequences, ecological security is threatened. These issues hinder the country's sustainable development goals [8].

Moreover, the publication titled "Developing High-Quality Human Resources for Realizing the Vision of Building a Prosperous and Happy Nation: Challenges and Remedies" declares: "The development of high-quality human resources holds immense significance as it contributes to unlocking the potential and capabilities of individuals, aligning with their steadfast national aspirations for prosperity and happiness. This aspect has garnered considerable attention, especially in light of the ongoing global trend of digital transformation impacting every facet of the world" [2]. Additionally, the article "Strategies for Poverty Reduction to Fulfill Sustainable Development Requirements" contends that to achieve sustainable poverty reduction, there is a need to invest in and innovate within the education sector, focusing on training quality human resources capable of meeting the demands of socio-economic development and research [9].

This work underscores the paramount significance of high-quality human resources, playing a pivotal role in shaping a globally competitive knowledge-based economy. Both national and international researchers have demonstrated a burgeoning interest in this exceptional workforce, recognizing its pivotal role in propelling the establishment of a global knowledge-based economy. Consequently, the cultivation of high-quality human resources stands as a focal point for policymakers and stakeholders engaged in economic and social development. Despite the myriad studies addressing this topic, the author observes a notable gap in the existing literature, particularly the absence of studies specifically delving into the challenges and remedies concerning the development of high-quality human resources in Vietnam. Building upon the foundations laid by previous

scholars, the author aims to delve deeply into these issues and provide comprehensive solutions for the advancement of high-quality human resources in Vietnam.

In the context of international integration, attention and investment in developing high-quality human resources are essential to meet the demands of modern, sustainable economic growth. However, the quality of human resources in Vietnam currently faces numerous challenges, including physical health, professional qualifications, work ethic, and labor discipline. In the near future, Vietnam needs to implement a comprehensive system of solutions to address these issues.

Based on the phenomenon and research gaps, this study aims to answer the following research questions

- What are the results and limitations for developing high-quality human resources to meet the requirements of rapid and sustainable development in Vietnam?
- What are the recommendations for developing high-quality human resources to meet the requirements of rapid and sustainable development in Vietnam in the future?

2. Research method

2.1. Theoretical perspectives on developing high-quality human resources

Diverse viewpoints exist regarding the concept of high-quality human resources. The International Labor Organization defines a country's human resources as encompassing all individuals of working age. In contrast, the World Bank adopts a more holistic approach, considering high-quality human resources to include the entirety of human capital, comprising physical health, mental capacity, and vocational skills of each individual. Consequently, the former perspective emphasizes quantity, perceiving human resources as the labor force contributing to social development based on the total number of individuals of working age, as stipulated by the state, and their available labor time. On the other hand, the latter perspective emphasizes quality, regarding human resources as the amalgamation of factors related to the physical health, mental capacity, professional qualifications, and vocational skills of the workforce.

These distinct perspectives give rise to varied interpretations of high-quality human resources. From a quantitative stance, high-quality human resources are construed as individuals with formal training, degrees, and technical expertise. Consequently, those lacking formal training but possessing exceptional abilities matching complex job requirements are excluded from the high-quality labor category. Conversely, some individuals with formal training who do not meet corresponding job requirements are still deemed high-quality human resources. On a qualitative front, high-quality human resources represent a subset of the labor force possessing the capacity to meet intricate job requirements, generate high productivity and efficiency, and contribute significantly to social development. Approaching the concept from this perspective poses challenges in terms of statistical measurement, management, and the overall development of high-quality human resources [10].

Therefore, building on the viewpoints of the aforementioned studies, it can be summarized that human resources comprise the total quantity and quality of human beings, encompassing various criteria related to mental capacity, physical health, moral character, and spirit, all of which contribute to the capacity that individuals and society have, are currently employing, and will continue to mobilize in the process of creative labor for the development and progress of society.

The functions listed below underscore the pivotal role of high-quality human resources in propelling economic and social development:

- **Integration into the global economy:**
The significance of high-quality human resources is paramount when a country aims to integrate into the global economy. These resources possess the ability to adapt swiftly, acquire new skills, and fulfill the escalating demands of society. Throughout the phases of industrialization and modernization, high-

quality human resources play a pivotal role in attracting foreign investments and spearheading the establishment of new industries. This, in turn, generates fresh opportunities for local labor, fostering economic growth and competitiveness on the global stage.

- **Technology and knowledge acquisition:**
High-quality human resources have quick access to knowledge and technology. They efficiently apply these assets to business operations, resulting in increased labor productivity and reduced costs. This, in turn, enhances the competitiveness of businesses in the market and stimulates economic growth. Additionally, high-quality human resources can lead, train, nurture, and guide the workforce with lower educational qualifications, enabling them to access machinery, science, technology, and modern management techniques. This forms the basis for societal progress. Research and development high-quality human resources play a significant role in research and development, particularly in the field of technology. They are a resource that supports the Party and the State through strategic contributions, legal regulation improvements, and political stability. Strengthening the connection between the State and businesses, creating a favorable environment for creative business operations, and contributing to economic and political stability are also key functions of qualified human resources [11]. In essence, qualified human resources create a positive ripple effect on various aspects of economic and social development, laying the foundation for sustainable growth and prosperity. They are crucial in attracting investments, fostering innovation, and supporting political stability and economic development.

2.2. Theoretical perspectives on sustainable development

Sustainable development is a multifaceted concept that integrates economic growth, social inclusion, and environmental protection to ensure that development meets the needs of the present without compromising the ability of future generations to meet their own needs. In the 1987 report *Our Common Future*, the United Nations World Commission on Environment and Sustainable Development officially defined sustainable development in a relatively complete way: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [12]. The concept of sustainable development was further refined and expanded by the United Nations at the Rio de Janeiro Conference in 1992, the Johannesburg Conference in 2002, and the Rio+20 Conference in June 2012. At these conferences, the definition of sustainable development was broadened and specified to include issues such as poverty reduction, inequality, employment, and social security, with a focus on human-centered development. Particularly, the Rio+20 Conference emphasized key areas such as eradicating poverty, ensuring social security, developing a green economy, and establishing a framework for sustainable development.

In Vietnam, sustainable development is a fundamental component of economic and social development reforms. The Politburo's Directive No. 36-CT/TW, dated June 25, 1998, addresses the enhancement of environmental protection during the period of industrialization and modernization. Since then, the Communist Party of Vietnam has continuously refined and expanded the concept of sustainable development (later referred to as rapid and sustainable development) to suit the country's conditions. In Section 4, Article 3 of the Environmental Protection Law, sustainable development is defined as: "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs, based on a close and harmonious combination of economic growth, social progress, and environmental protection" [13]. This is a general definition that highlights the most important requirements and goals of sustainable development, tailored to the conditions and situation in Vietnam.

When addressing sustainable development, the Communist Party of Vietnam states: "Economic growth must go hand in hand with cultural development, progressively improving the material and spiritual lives of the people, achieving social progress and equity, and protecting and enhancing the environment. Economic and social development should be combined with strengthening national defense and security" [14]. It further emphasizes, "Rapid development must be coupled with sustainable development. Economic growth should be linked with cultural development, comprehensive human development, democratic practices, social progress,

and equity. It should create job opportunities, improve living standards, encourage lawful wealth creation alongside poverty reduction, and gradually narrow the development gap between regions. Environmental protection and improvement must be a priority at every stage of development. Economic development must also ensure political and social stability, as this is the foundation and condition for rapid and sustainable progress” [15].

It can be observed that, both theoretically and practically, the concept of sustainable development in Vietnam has been expanded to include new factors that align with the specific conditions and history of the country. These factors include maintaining political stability and strengthening national defense and security. This approach accurately reflects the current state of globalization and has become a consistent policy in leadership, management, and governance. It is especially significant in the context of industrialization, modernization, market economy development, and international integration. Building on progressive viewpoints from reputable global organizations and particularly Marxist perspectives, the author argues that sustainable development is the ability to maintain scale, speed, and efficiency while ensuring social progress and equity, environmental protection, political and social stability, and safeguarding national independence, sovereignty, and territorial integrity. According to this understanding, sustainable development must ensure the core components, as shown in Figure 1.

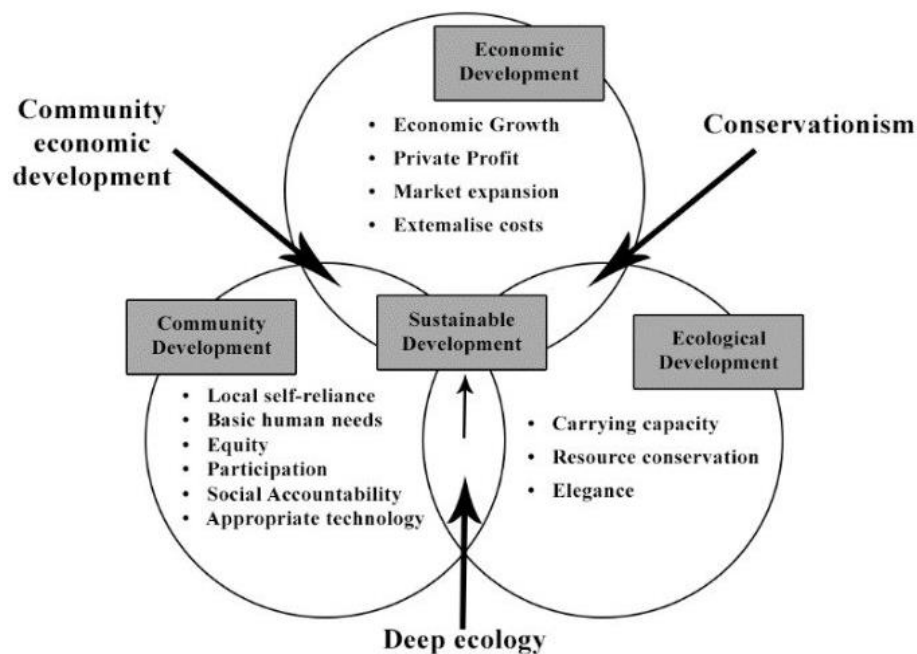


Figure 1. The sustainable development model, sourced from [23]

- **Economic development:**

Economic development should be measured by indicators that ensure long-term growth with speed, scale, and efficiency. The structural shift should move towards modernity, effectively utilizing resources, especially science and technology. The economy's competitiveness should continually improve, and economic growth should become increasingly stable and sustainable.

- **Community development:**

This involves achieving social progress and equity, poverty reduction, social security, and welfare, and improving the quality of life for the people. The government should implement proactive social policies to enhance living standards, create jobs, and ensure that all citizens have access to healthcare, education, sanitation, and other services throughout the economic growth process.

- **Ecological development:**

Economic and social development should be closely linked with environmental protection. Social progress must not destroy the environment or ecological systems and should not impair future generations' ability to access natural resources and enjoy a healthy environment. Sustainable development requires the rational and efficient use of natural resources, protecting and regenerating them, maintaining ecological balance and biodiversity, and minimizing environmental degradation. Development planning should pay special attention to the human impact on nature [16].

Understanding these interdependencies and devising appropriate ways for organizations and societies to function under such complex conditions requires creative and innovative thinking and enterprising actions [17].

Additionally, the research employs various methods such as analysis and synthesis, deductive and inductive reasoning, historical and logical methods, comparison and contrast, structural systems approach, and statistical methods to present its findings.

3. Results and discussion

3.1. Results of developing high-quality human resources to meet the requirements of rapid and sustainable development in Vietnam

First of all, Vietnam possesses an immensely diverse and rich labor force, surpassing many countries in the region and worldwide. According to data from the General Statistics Office, in 2023, the labor force aged 15 and above in Vietnam reached 52.4 million people, an increase of 666.5 thousand people compared to 2022. Among them, women accounted for 24.5 million people (46.7%) and men accounted for 27.9 million people (53.3%). The labor force in urban areas was 19.5 million people (37.3%), while in rural areas it was 32.9 million people (62.7%). This indicates that Vietnam has a very abundant labor force with a relatively balanced ratio between men and women. With appropriate policies, Vietnam can effectively harness and utilize this human resource to promote the country's development.

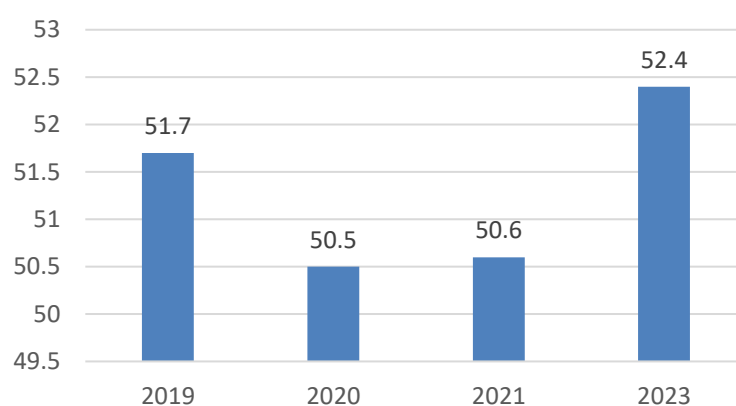


Figure 2. The labor force aged 15 and above, from 2019 to 2023; unit: million people

Vietnamese workers are highly regarded by countries globally for their characteristics such as agility, diligence, attentiveness, responsibility, sociability, friendliness, and a spirit of unity.

Regarding the structure of the trained workforce: The educational attainment of Vietnam's workforce has consistently improved over the years. The proportion of the labor force with training has more than doubled in about 20 years, from 10.3% (in 2000) to 22.8% (in 2019). In the period from 2009 to 2019, the educational level of Vietnam's workforce has been elevated, with a significant increase in the distribution of labor force according to educational levels, particularly in higher education, and a notable decrease in lower educational levels. Not only has there been an improvement in educational attainment, but also the technical expertise of Vietnam's workforce has continuously advanced. The percentage of the population with technical specialization has increased significantly since 2007, with a growth of 6.3 percentage points, from 17.7% (in 2007) to 24% (in

2020). The population with a university degree or higher has also experienced the most substantial growth, rising from 4.9% (in 2007) to 11.1% (in 2020). This indicates that in recent years, higher education and postgraduate education in Vietnam have undergone significant changes, contributing significantly to the enhancement of the country's workforce quality.

Table 1. Percentage of trained workers aged 15 and over by qualification; Unit: %

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---------------------|------|------|------|------|------|------|------|
| Qualification | | | | | | | |
| Vocational training | 3,3 | 3,2 | 3,5 | 3,6 | 3,7 | 4,7 | 5,8 |
| Intermediate | 5,4 | 5,3 | 5,3 | 5,2 | 4,7 | 4,4 | 4, |
| College | 3,0 | 3,2 | 3,3 | 3,7 | 3,8 | 3,8 | 3,6 |
| Graduate and above | 8,7 | 9,2 | 9,5 | 9,5 | 10,6 | 11,1 | 11,7 |
| Total | 20,4 | 20,4 | 21,6 | 22,0 | 22,8 | 24,1 | 26,1 |

As of 2020, the Human Capital Index (HCI) of Vietnam demonstrated a noteworthy rise from 0.66 to 0.69 over the span of a decade, as reported by the World Bank (WB). Notably, Vietnam has achieved this advancement despite comparatively lower public spending on healthcare, education, and social protection. Surpassing the average HCI of nations with similar income levels, Vietnam stands among the top-ranking countries in the East Asia-Pacific region.

Second, regarding the Human Development Index (HDI) between 2016 and 2020, the HDI of Vietnam and most of its 63 centrally governed provinces and cities consistently increased each year. Nationally, the HDI rose from 0.682 in 2016 to 0.687 in 2017, 0.693 in 2018, 0.703 in 2019, and 0.706 in 2020. This progress marked Vietnam's transition from a medium HDI category to a high HDI category in 2019 and 2020. Vietnam's HDI ranking improved from 118th in 2018 to 117th in 2019, with expectations for further advancement in 2020 once the UNDP updates its rankings. Despite the national and local HDI growth, the pace of this increase was modest. By 2020, the national HDI had only increased by 0.024 points compared to 2016, averaging an annual growth rate of 0.9%. Although Vietnam advanced from Group 3 to Group 2, its position within Group 2 remained low internationally. In the global HDI ranking, Vietnam held the 7th position out of 11 Southeast Asian countries [18]. This highlights the ongoing importance of improving education and training quality, especially in developing a high-quality workforce to enhance human development further.

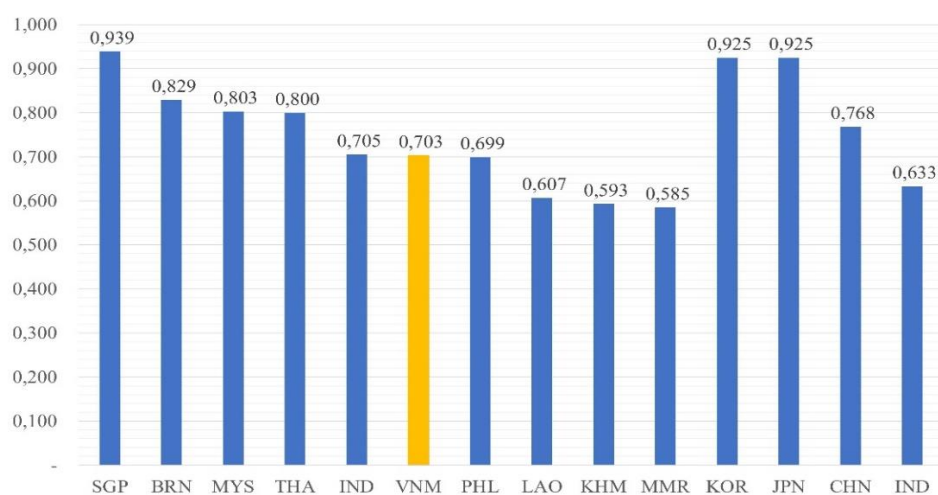


Figure 3. HDI values of countries in Southeast Asia and India, Japan, Korea, and China in 2021

In summary, the workforce quality in Vietnam has witnessed significant improvement, playing a crucial role in elevating the nation's labor productivity. In the year 2020, the overall labor productivity, measured at current prices, achieved 117.9 million VND per worker (equivalent to 5,081 USD per worker), marking a substantial 5.4% increase from the previous year. The period spanning from 2016 to 2020 saw an impressive average annual growth rate of 5.78% in labor productivity, surpassing the 4.35% average growth observed during the 2011-2015 period. The cumulative average growth rate for the entire 2011-2020 period reached 5.07% per year [18].

When compared to other countries in the region, Vietnam's labor productivity remains relatively low, and the absolute gap continues to widen. Vietnam's labor productivity is higher only than Cambodia, comparable to Myanmar and Laos, but lower than India, the Philippines, Indonesia, China, and Thailand, and notably much lower than Malaysia and Singapore. This situation presents notable challenges for Vietnam in enhancing the quality of its workforce to align labor productivity with that of the leading countries in the region.

Third, there is a strong emphasis on the excellence of human resource training. Education and training stand as paramount national policies, embraced by the Party, the State, and the entire populace. The profound and comprehensive transformation of education and training, coupled with the enhancement of human resource quality, ranks among the three strategic breakthroughs for national development. This unwavering perspective has been consistently upheld by the Party across numerous Congresses. In pursuit of this mission, the education sector, under the steadfast guidance of the Government, has embarked on an innovative journey. Despite facing numerous difficulties and challenges, significant strides have been made, resulting in noteworthy achievements. Notably, Vietnam's Human Development Index is acknowledged to be in the high bracket, a remarkable feat considering our nation's modest income. Furthermore, Vietnam's general education quality has garnered international recognition. The 2018 PISA (Program for International Student Assessment) evaluation saw Vietnam achieve a score of 543 in science, ranking fourth out of 79 countries. This outcome solidifies Vietnam's position as on par with nations renowned for their advanced education systems. In international Olympiad exams, Vietnamese students consistently excel, securing top positions for several consecutive years. Even in the distinctive circumstances of the 2020 academic year, marked by the simultaneous continuation of teaching and learning amidst epidemic prevention efforts, Vietnamese students achieved remarkable success in the intellectual arena. Every participating student in the exams that year earned prizes, showcasing their excellence and bringing pride to the nation.

Moreover, the development of a high-quality workforce contributes to the protection of the ecological environment. Recently, the Vietnamese government has focused on researching and proposing appropriate mechanisms and policies to attract investment for the rapid remediation and restoration of polluted river basins. The government has established regulations, technical standards, and economic-technical norms, and has provided guidelines for environmentally friendly waste treatment and recycling technologies, such as waste-to-energy incineration, while gradually reducing landfill waste disposal. To date, 11 waste-to-energy plants have been implemented in Hanoi, Can Tho, Ho Chi Minh City, Bac Ninh, Da Nang, Thai Nguyen, and Phu Tho, with a combined capacity of over 16,000 tons per day and a power generation capacity of 270 MW. Notably, the number of environmental law violations causing pollution decreased by 65.38% compared to 2021, and the proportion of citizens concerned about environmental issues dropped significantly (from 12.53% in 2016 to 4.03% in 2021, and further down to 1.55% in 2022). The recycling industries grew by 11.3% compared to 2021, making Vietnam the 10th-ranked country for recycling metals, plastics, paper, and glass, laying the foundation for a circular economy. Additionally, the forest coverage rate has steadily increased, 90% of the urban population now has access to clean water, and disaster prevention and mitigation efforts have been enhanced, with an emphasis on forecasting and warning systems that operate professionally and proactively in all situations. Biodiversity conservation has also received increased attention [19].

3.2. Limitations to the development of high-quality human resources to meet the requirements of rapid and sustainable development in Vietnam

With the above analysis, it is evident that developing a high-quality workforce to meet the requirements of rapid and sustainable development has become a comprehensive multi-sectoral and inter-sectoral development approach. It serves as an action program with increasingly specific and clear criteria. Therefore, developing a high-quality workforce to meet the demands of rapid and sustainable development is an inevitable and noble goal of the development process. In recent times, Vietnam has achieved positive results contributing to improving the quality of life for its people. However, there are still limitations in developing a high-quality workforce to meet the requirements of rapid and sustainable development in Vietnam, such as:

Firstly, Vietnam's human resources have increased in quantity, but there are certain limitations in quality. Vietnamese workers are highly appreciated in theory, but their practical capacity as well as the ability to apply technology and high techniques to the labor and production process are still limited. In addition, the professional ethics and labor discipline of a part of workers are currently not highly appreciated. Vietnamese workers must improve their limitations in foreign language and computer skills, their ability to adapt to a working environment

with competitive pressure, and their teamwork and skills in communication, time management, and ability to resolve conflicts during the work process. Therefore, paying attention to overcoming limitations, promoting strengths, and creating a generation of workers with comprehensive physical, mental, and spiritual development is necessary in the current period. The proper organization of education has not received enough attention, even though it is considered a national policy. Specifically, in the arts and culture sector, policies to train and foster top talents in the field of arts. Due to difficulties in the selection process with high foreign language requirements and standards, it is necessary to send young talents abroad for training under Project 1437/QĐ-TTg, dated July 19, 2016. The government on "Training and fostering cultural and artistic human resources abroad until 2030" did not achieve the set goals. According to the project's goal, each year 20 officials will be sent to study for masters and doctorates in developed countries. However, after 6 years of implementation, only one person has studied for a master's degree and no staff has been sent to study for a doctorate. This is posing a big challenge for specialized training institutions in culture and arts when qualified and specialized forces are gradually becoming scarce; warns of a crisis in human resources in training and fostering the next team.

Secondly, the training of high-quality human resources does not align adequately with the demands of society. The current limitations in the quality of high-quality human resources, particularly among university graduates, are evident. Primarily, the training quality for students, who represent the future high-quality human resources, falls short of meeting the requirements of real-world production, business, and service scenarios. Graduates often lack proficient professional skills, struggle with foreign languages and soft skills, and encounter a disconnection between their training and practical application in professional settings. Notably, teaching methods remain outdated, failing to incorporate modern technologies. The curriculum development process lacks practical programs, resulting in a dearth of opportunities for students to apply their acquired knowledge to address tangible social challenges. Although training methods are changing among universities and businesses and Vietnam has good educational models, implementation is too slow and the responsibility lies with relevant state agencies. However, autonomous universities have adapted very quickly to new requirements as they are given more rights to do what they want and show more responsibility towards society in training quality human resources. Next, the scientific research activities of university officials and lecturers still have many shortcomings.

Regarding the quality of scientific and technological personnel, it remains constrained by a scarcity of proficient and pioneering scientists and experts in high-tech domains. A survey by the Association of Foreign Investors in Vietnam indicates that the deficiency in Vietnam's high-quality human resources is particularly evident in the shortage of skilled individuals in leadership positions, notably CEOs. Unfortunately, Vietnam currently does not have any CEO training facilities. Furthermore, science and technology human resources are unevenly distributed, and some parts spend a lot of time on management work; the spirit of collaborative research and teamwork skills are still weak, making it difficult to form strong research groups and long-term, sustainable interdisciplinary research groups.

Not only is intellectual capacity still limited, but the physical strength of Vietnam's human resources is also weak, especially high-quality human resources, which have a large gap compared to other countries. According to the announcement of the Ministry of Health in 2021, the average height of Vietnamese people for men is approximately 1.68 m and for women is 1.56 m. This height is very low compared to the average height of most countries in Asia and much lower than European countries. According to the Ministry of Health, on average in the past 30 years, Vietnamese people have only grown 4.5 cm taller, meaning that each decade they have grown taller by more than 1 cm. Weak physical strength, poor endurance, and working capacity, so Vietnamese workers often only work with short attention spans, get tired quickly, and are not of high quality [20]. This limitation has had a somewhat dampening effect on the labor productivity of high-quality human resources in the context of Vietnam's socio-economic development.

Thirdly, the alignment between labor supply and demand falls short of societal expectations. A particularly troubling issue arises from the fact that many workers find themselves employed outside their trained fields,

lacking congruence with their professional qualifications and acquired skills. Recent statistics from 2021 highlight this concern, revealing that 81.1% of workers possess college degrees, with 60.4% holding intermediate degrees, and yet 23.8% of those with college degrees or higher are employed in roles that demand technical expertise or skills below their trained proficiency level (as indicated by their degrees or certificates). Conversely, approximately 35.1% of workers are engaged in occupations requiring higher technical expertise or skills than their attained degrees suggest. This disconnection significantly contributes to the challenge of having an "oversupply of teachers and a shortage of workers". In general, the connection between labor supply and demand has not met social requirements in Vietnam while the international market is increasingly expanding. Therefore, according to the law of labor supply and demand, labor will move to places where there is demand or where the value of labor is paid higher. This is also one of the reasons for the phenomenon of brain drain in Vietnam

The distribution of high-quality labor resources by region is not reasonable, with large disparities between urban and rural areas and between economic regions. Currently, the issue of distributing high-quality labor resources in Vietnam still faces many difficulties and challenges. In particular, the large disparity between urban and rural areas and between economic regions is increasing the development gap in these areas. Urban areas, especially large cities, are home to large and modern businesses, and the demand for high-quality labor here is huge. Meanwhile, in rural areas and economically disadvantaged areas, the supply is very little. However, the supply cannot meet this demand, as many students and young workers lack the necessary knowledge, skills, and experience to work at businesses big and modern. Meanwhile, in rural areas, high-quality labor resources are in short supply. Most of them are villagers and do not have the opportunity to access high-quality education, and do not have the opportunity to learn and practice the necessary skills to be able to work in modern occupations.

Additionally, the workforce dedicated to environmental protection is inadequate, both in quantity and quality, failing to meet the required standards, especially at local levels. The compliance with environmental laws and the maintenance of environmental hygiene among production and business households, particularly those in craft villages, remain poor. The sense of responsibility for environmental protection among many factories and production facilities is not high, lacking initiative and prioritizing profit over environmental safeguarding. Policies regarding inspection, examination, and handling of violations have not been sufficiently emphasized and perfected, resulting in lax management and a lack of accountability in environmental monitoring and supervision. The regulations on sanctions for acts that harm the environment are not strong enough and lack effective deterrence; very few cases of environmental damage are prosecuted criminally, leading to low effectiveness and efficiency in addressing environmental law violations.

3.3. Recommendations for developing high-quality human resources to meet the requirements of rapid and sustainable development in Vietnam in the future

Increasing awareness of the crucial role, position, and significance of high-quality human resources in the country's industrialization and modernization is of utmost importance.

- Acknowledging high-quality human resources as the most valuable asset, the driving force behind the nation's rapid and sustainable development is a critical element in ensuring systematic and focused development in line with predetermined goals and requirements. In the pursuit of advancing high-quality human resources, special attention should be given to nurturing a cadre of adept leadership and management officials, a team of experts, and a group of cutting-edge science and technology professionals. These individuals form the core of the 'flagship team,' playing a decisive role in steering the development of high-quality human resources from conceptualization to principles, policies, and effective implementation. Embracing the perspective that cadres are the decisive factor determining the success of the Vietnamese revolution, the renewal process, and international integration; intertwining the Party's leadership renewal with innovative cadre work; and implementing the cadre strategy effectively during the period of industrialization and modernization are critical steps. This entails

innovative thinking, adopting practical and effective methodologies, and addressing weaknesses in each phase of cadre work.

- Adhering to the viewpoint that humans are the foundation and the determining factor in sustainable economic and social development, ensuring security and defense; comprehending the role and responsibility of investing in, nurturing, and utilizing human resources; and transforming the challenge of human resources into an advantage is imperative. This transformation necessitates a profound shift in awareness at all levels, across all sectors, and in all localities. The development of high-quality human resources must be comprehensive, and synchronized, with a focused emphasis, a long-term vision, and appropriate steps. This involves ensuring a balanced structure and distribution of human resources by sector, field, region, and locality, based on the economic structure and the goals of economic and social development in each area. Simultaneously, there is a need to augment the leadership of all levels of Party committees and enhance the responsibility of leaders in identifying, developing, monitoring, and utilizing human resources in agencies, units, and localities.
- Facilitate fundamental and robust transformations in the quality and effectiveness of education and training:
Only through these fundamental and robust transformations can we educate a workforce with good health, professional expertise, high-level skills, and suitable social qualities. To implement this solution, specific measures include researching and refining the textbook system and examination system at all levels of education to align with practical requirements; emphasizing the training and retraining of teachers to meet the demands of fundamental innovation and comprehensive education and training; shifting the educational process from primarily imparting knowledge to developing comprehensive competencies and qualities in learners; diversifying forms of learning, such as online learning, internet-based education, television, social activities, and scientific research; promoting compulsory early childhood education and primary education. Integrating minimal digital and foreign language skills into the mainstream education curriculum; focusing on educating cognitive skills and behaviors for secondary school students. Strengthening vocational guidance after lower secondary education; providing career orientation in upper secondary education. Reducing illiteracy rates in especially difficult areas and among ethnic minority communities. Restructuring the school system; developing a balance between public and private education, between regions, prioritizing especially difficult areas, ethnic minority communities, border areas, islands, and specific policy groups [21].
- Increase investment in education and training from various sources, with an emphasis on increasing state budget allocation:
Simultaneously, mobilize more and better resources from the public through promoting the socialization of education and building a learning society. Diversify forms of training, improve policies for developing non-public training institutions, implement autonomy mechanisms for university education in line with global trends; and establish public-private cooperation models in university education.
- Agencies, committees, and departments are encouraged to convene conferences aimed at soliciting the perspectives of employers, enabling them to formulate tailored plans for the development of high-quality human resources. With a commitment to innovation, creativity, proactive measures, and integrity, these entities should consistently seek input from the public and businesses to address challenges and deficiencies effectively. This approach creates optimal conditions to ignite and empower human resources, particularly high-quality ones, fostering their role in advancing sustainable and stable development across organizations, units, and localities. Emphasis should be placed on actively promoting the practical implementation of digital transformation within businesses, facilitating employee access to new technologies. This empowerment enables individuals to engage in self-directed learning and research, applying the advancements of the Fourth Industrial Revolution to production, application, and problem-solving. Government agencies, committees, and departments must diligently uphold the commitments, plans, timelines, and assurances established during meetings and dialogues

between provincial leaders businesses, and investors, while also addressing the aspirations and expectations of high-quality human resources. This holistic and responsive approach contributes to a more dynamic and adaptive environment for workforce development, aligning with the evolving needs of both businesses and individuals [22].

- Enhance your skills consistently, irrespective of time and location:
A fundamental and vital approach to delivering education and training aligned with both socio-economic development demands and people's learning requirements involves the implementation of a learning society policy. This strategy is explicitly detailed in the Government's initiative for constructing a Learning Society spanning from 2021 to 2030, featuring well-defined objectives. Simultaneously, there is a pressing need to nurture and cultivate the capabilities for lifelong learning. From a theoretical and systematic perspective, the development of lifelong learning capabilities is the core and nucleus of building a learning society in the context of science and technology becoming a productive force. In practical terms in Vietnam, the emphasis on building a learning society with a focus on lifelong learning is clearly reflected in the Government's Project, which aims to have, by 2030, 60% of citizens awarded the title of a learning citizen, 50% of districts recognized as learning districts, and 35% of provinces recognized as learning provinces. This solution needs to be extended to various institutions and organizations, especially business entities, meaning that the government should create opportunities and conditions for these organizations to become "learning organizations." This implies implementing the solution for building a learning society to ensure that both labor users and labor providers are motivated to learn and develop lifelong learning capabilities. This enables them to learn and apply the best practices, both domestically and globally, "here and now".
- Accelerate the restructuring of the workforce towards sustainability.
Focus on boosting investment in industries with high knowledge and technology content, competitive advantages, high added value, and environmental friendliness. Enhance economic restructuring in export processing zones and industrial parks by strengthening investment attraction, and developing modern industries that are less labor-intensive. Develop strategies and plans for technological innovation to enhance high intellectual property content goods and services to meet the demands of international integration. Concentrate investment capital on the development of science and technology, focusing on the city's key strengths. Promote mechanisms for negotiating and agreeing on wages to ensure that actual wages are paid according to market mechanisms and commensurate with workers' contributions to growth. Additionally, promotes the freedom of job choice and labor mobility (vertical mobility across skill levels; horizontal mobility across ownership sectors, regions, and internationally) to meet the demands of economic restructuring towards industrialization and international economic integration. Develop a comprehensive labor market infrastructure (career guidance, employment services, labor market information, and forecasting) and effectively organize the provision of public employment services.

4. Conclusions

Developing a qualified and revolutionary workforce that meets the demands of societal development is a crucial and long-term challenge. Therefore, a comprehensive examination and evaluation of the current landscape of high-quality human resource development are highly important, encompassing economic, political, social, and human resource management domains. This multifaceted analysis is indispensable for gaining a thorough understanding and devising fitting strategies for advancement. To effectively shape a human resource development strategy, innovation must permeate various facets, fostering a fair, disciplined, ethical, and law-abiding milieu that serves as the benchmark. This approach aims to cultivate a cultural environment that steers the trajectory of human resource development. As Vietnam embarks on a journey of modernization, transitioning towards a knowledge-based economy in the context of evolving but not highly advanced economic and social development, the pivotal factor for the success of the reform process lies in elevating the quality of

its human resources. Vietnam recognizes the refinement of human resource quality as a fundamental prerequisite for achieving rapid and sustainable development. This imperative is essential for bridging the development gap, propelling economic growth, and steering the country toward successful industrialization and modernization for sustainable progress. Moreover, it stands as a critical requirement for effective international integration.

The integration into the global economy offers opportunities for Vietnamese laborers to work abroad, augment their income, and gain valuable insights into organizational, management, and production practices from other nations. However, for Vietnamese workers to participate in the global labor market, they must meet rigorous international and regional standards. Given that a significant portion of the Vietnamese workforce hails from rural, agriculture-based backgrounds, comprehensive policies are indispensable to cultivating a high-quality workforce. This strategic approach ensures that these workers not only meet international standards but also enhance their prospects for labor export, thereby contributing significantly to the country's foreign exchange earnings. Consequently, the national development strategy must prioritize human resources as a focal point, creating favorable conditions for the augmentation of intellectual capacity, willpower, and confidence. A high-quality workforce, characterized by an appropriate quantity and structure, enriched with intelligence, determination, and aspirations, infused with revolutionary enlightenment, can function as the propelling force to swiftly propel Vietnam into an industrialized and modernized nation. Such a transformation is imperative to meet the demands of the ongoing Industrial Revolution 4.0, unfolding at a rapid pace. Creating a qualified and revolutionary workforce that meets societal development demands is a crucial, long-term challenge. A comprehensive examination of high-quality human resource development is essential, covering economic, political, social, and HR management domains. This multifaceted analysis is vital for understanding and devising appropriate strategies for advancement. Effective human resource development strategy requires innovation across various facets, promoting a fair, disciplined, ethical, and law-abiding environment as the standard. This approach aims to cultivate a cultural setting that guides human resource development. As Vietnam modernizes and transitions towards a knowledge-based economy amid evolving, yet not highly advanced economic and social development, the success of the reform process hinges on enhancing human resource quality. Vietnam recognizes that refining human resource quality is crucial for rapid and sustainable development. This is essential for closing the development gap, driving economic growth, and achieving successful industrialization and modernization. It is also critical for effective international integration. Global economic integration offers Vietnamese workers opportunities to work abroad, increase their income, and gain valuable insights into organizational, management, and production practices from other countries. However, to participate in the global labor market, Vietnamese workers must meet stringent international and regional standards. Given that many Vietnamese workers come from rural, agriculture-based backgrounds, comprehensive policies are needed to develop a high-quality workforce. This approach ensures that these workers meet international standards and improve their prospects for labor export, significantly contributing to the country's foreign exchange earnings. Thus, the national development strategy must prioritize human resources, creating favorable conditions for enhancing intellectual capacity, willpower, and confidence. A high-quality workforce, characterized by appropriate quantity and structure, enriched with intelligence, determination, and aspirations, and infused with revolutionary enlightenment, can propel Vietnam into an industrialized and modernized nation swiftly. This transformation is vital to meet the demands of the rapidly unfolding Industrial Revolution 4.0.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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Author contribution

Conceptualization, Pham Ngoc Thanh; methodology, Pham Ngoc Thanh and Nguyen Quoc Thang; formal analysis, Pham Ngoc Thanh; resources, Pham Ngoc Thanh; data management, Pham Ngoc Thanh; writing original manuscript preparation, Pham Ngoc Thanh; writing review and editing, work plan, and corresponding author Nguyen Minh Tri; supervisor, Pham Ngoc Thanh. All authors have read and approved the published version of the manuscript.

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Ethical approval is not applicable to this research.

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