

Awareness of Universities Lecturers: Roles of Education and Training in Knowledge Economy Development in Vietnam Nowadays

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1. Abstract: This article focuses on analyzing, explaining essential aspects of theory of knowledge economy development in Vietnam, roles of education and training, and factors determining the roles in development of the knowledge economy in Vietnam. The article then assesses status quo and summarizes issues to be dealt with while carrying out roles of education and training in development of the knowledge economy in Vietnam nowadays. Based on findings, the author proposes basic solutions to promote the role of education and training in the development of the knowledge economy in Vietnam, meeting the requirements of soon making Vietnam become a modern industrialized country.

Awareness of lecturers of roles of education and training in the development of the knowledge economy in Vietnam is a complicated issue, as in Vietnam the development of the knowledge economy has been started in the last two decades. In order to develop knowledge economy in Vietnam, one aspect of determinant implication is to properly understand position and roles of education and training in developing Vietnamese people comprehensively and improving quality of human resources for actors of the development of the knowledge economy. From aforesaid approach, the author analyzes, clarifies the nature and the intrinsic manifestations of roles of education and training in the development of knowledge economy in Vietnam, then points out factors determining roles of education and training in the development of knowledge economy in Vietnam; at the same time, analyzes and indicates practical implications of roles of education and training in the development of knowledge economy; and finally proposes solutions to promote roles of education and training in the development of knowledge economy in Vietnam.

* **Keywords:** Education and training, science and technology, knowledge economy, development of the knowledge economy, lecturers, scientists.

2. Introduction

In the 21st century, human witnesses rapid development of the modern scientific and technological revolution. In such new context, scientific and technological knowledge has really become a direct force of production, knowledge economy emerges and becomes an objective and inevitable development trend of human. This has been attracting interest of research in knowledge economy, the development of knowledge economy and roles of education and training in the development of knowledge economy of the leaders, enterprise management, scientists, and educators. This topic has become the focus of conferences and arguments of the world's scholars, including managers and scholars in Vietnam. As a result, many researches which have become well known and had great social influence have been conducted; such researches have been adopted, inherited and applied by many countries around the world in developing their education and training systems, improving quality of human resources to meet requirements of international integration and development of the knowledge economy, including Vietnam.

Reviews of literature of authors in the world have shown special interest of the authors in researching roles of education and training in the development of the knowledge economy. In general, the authors agree that the roles of education and training are especially important, if not critical, for developing human resources and informatics technology, and for narrowing down digital divide in the context of Industry 4.0. In accessing and developing knowledge economy, "all countries, from the U.S., EU, Japan to China, India, Singapore, Malaysia and others, are paying much attention to educating and training human resources..."[1]. In strategies for the development of the knowledge economy, developed countries like the U.S., the U.K., Japan, etc. have included preferential policies for developing key and high-tech fields, conducting research and deployment, and investing in human capital, especially educating and training high quality human resources and employing talents.

Developing countries, like China, India and other Asian countries also launch optimized preferential policies for training and developing high quality human resources to create their absolute advantages for the development of the knowledge economy. In general, almost all countries determine that: In order to develop knowledge economy, the prerequisite is to radically, comprehensively and synchronously reform their education and training systems, employ talents and maintain national political stability.

In Vietnam, leaders as well as scientists and educators agree that: Developing knowledge economy in Vietnam is an objective inevitability, is an opportunity for Vietnam to successfully implement development strategies, to soon make Vietnam become a modern industrialized country to achieve the goal of "rich people,

strong country, democracy, justice, and civilization". For this process to be carried out smoothly, efficiently and effectively, education and training play important and determinant roles.

In Vietnam, the National-level Project coded KX.02.03: "Development trends of knowledge economy and their impacts on development and selection of industrialization and modernization strategy of Vietnam" [2] is an in-depth research on knowledge economy that systematizes terms and definitions of knowledge economy proposed by international organizations and scientists in the world and in Vietnam. The Project then approaches knowledge economy from angle of productive forces, "from the angle of forces of production, knowledge economy is a new development level of forces of production of human society ..., this development trend is an objective inevitability and matches with prevalent principles".

However, "knowledge economy as a complete socio-economic formation having relations of production relations matching with forces of production has not yet existed, or has not been recognized" [3, pp. 20].

Agreeing with aforesaid approach, we consider that knowledge economy is an economy that bases on knowledge, is formed when knowledge is utilized in all economic sectors; in that economy the majority of traditional economic sectors become knowledge-based ones and values created by knowledge takes up most of the total values of a product, perhaps 70-80%, or even 90-95% in certain products. As such, for developing countries like Vietnam, to develop knowledge economy of is an objective inevitability and matches with prevalent principles. Vietnam must creatively apply experiences of developed countries in creating and utilizing knowledge in order to develop domestic economy and forces of production and of course improve quality of human resources supporting the economy. Only then can Vietnam proactively and actively join in international integration and efficiently develop knowledge economy. In other words, development of the knowledge economy in Vietnam in fact is the implementation of "shortcut" industrialization and modernization strategy of which 90% of contribution is created by scientific knowledge.

Professor Dang Huu in the proceedings of scientific conference "Knowledge economy: sciences and practice in Vietnam" argues that: To develop knowledge economy in Vietnam means to promote the use of new knowledge and new technologies to accelerate structural change and economic growth, helping Vietnam shorten processes of industrialization and modernization. That is the best way to enhance internal capacities and actively join in international integration, in which "the most important components of internal capacity of a nation are culture, education and science, or in other words mental strength and wisdom of the nation" [4]. It can be confirmed that to strongly develop education and training, develop human resources, raise people's awareness, and to foster talents are breakthroughs in the development of the knowledge economy in Vietnam.

Having the same opinion, Nguyen Van Hoa in "Developing education and training - a drive to develop knowledge economy in Vietnam nowadays" [5] argues that in a knowledge economy, knowledge is the main component of production, an competitive advantage and quality of human resources, and strength of internal forces and attraction of external forces. Quality of human resources and knowledge of people must be attained via education and training. Therefore, it is a must for Vietnam to raise people's awareness, train human resource and foster talents on the basis of radical and comprehensive reform of education, which is essentially to create new drives to develop knowledge economy. This is a vital issue for Vietnam in the face of globalization and international integration nowadays.

Professor Pham Minh Hac in "Issues of education of Vietnam in the first half of the 21st century" [6, pp. 157] argues that for Vietnam to successfully carry out the process of accelerating national industrialization and modernization, joining in globalization and international integration, and developing knowledge economy, it is a must to invest in improving quality of human resources, especially human resources having postgraduate education levels. The author emphasizes that: "All come from the movement of culture - people - human resources - the factors determining internal forces of the nation and of each individuals which are created by education" [6, pp. 157].

Besides confirming roles of education and training in the development of the knowledge economy in Vietnam, a number of scholars point out limitations and drawbacks in realizing roles of education and training in the development of the knowledge economy in Vietnam nowadays and propose solutions to overcome such limitations and drawbacks and create drives for the development of the knowledge economy of Vietnam in the years to come.

Professor Hoang Tuy and others in "Issues of education nowadays - Opinions and Solutions" argue that: "Education of Vietnam is lagging rather far behind that of other countries in the region and in the world in all of the three aspects: People's awareness, human resources and talents, all of limitations are clearly shown ... low people's awareness is shown in ways of living and thinking, habits, behaviors, thoughts and senses. Ethical norms are compromised, fraudulence and dishonesty are seriously affecting all aspects of social life. That human resources fail to meet demands of economic development, have weak knowledge and practical skills, and are in short of flexibility, imagination and creativity is the characteristic of quality of labor that results in a very low competitive strength ... finding and fostering of talents are ineffective ... human capital is severely ignored" [7, pp. 32 - 33]. That is the panorama of education of Vietnam, showing the fact that the roles of education and

training have not met requirements of socio-economic development in general and development of the knowledge economy in particular in Vietnam nowadays.

It is stated in the Documents of the 8th Plenum of the 11th Central Committee of the Communist Party of Vietnam that: “education and training has not truly been a top national policy”. This statement is derived from factual situations of education of Vietnam nowadays. While confirming attained achievements, the Documents points out that: “Quality and effectiveness of education and training are still lower than required, especially that of higher and vocational education. The education and training system does not have transferability between different levels and modes of education and training ... training is not linked with scientific research, production, business and demands of labor market ... education of ethics, lifestyle and working skills is not adequately emphasized” [8, pp. 117].

It can be considered that aforesaid limitations are the main reasons of the urgent demand of radical and comprehensive reform of education and training in Vietnam in order to meet requirement of accelerating national industrialization and modernization, international integration and development of the knowledge economy. Regarding solutions to promote roles of education and training in the development of the knowledge economy in Vietnam nowadays, Tran Van Tung in “Knowledge economy and requirements of education of Vietnam” argues that in order to promote roles of education and training in the development of the knowledge economy in Vietnam it is necessary to fundamentally reform “the root” and to build up the education system of Vietnam to be modern and advanced and at regional and world levels. The author proposes a number of solutions, for example: “The State should launch policies for increasing investment in education by means of creating legal framework to attract funds from foreign investors and from domestic economic sectors ... learners and organizations employing labor should pay training expenses” [9, pp. 203 - 204]. In addition, it is necessary to change structure of training system to match with the development of the knowledge economy; the State of Vietnam should set up strict standards for establishment of non-public universities, properly conduct inspections in order that all sub-standard education institutions shall be resolutely closed by Ministry of Education and Training and that new private universities shall not be opened in an uncontrolled manner, and emphasizes on compilation of curricula, improvement of teacher quality and reasonably use of trained labor.

Researchers of the Project “Development trends of knowledge economy and their impacts on development and selection of industrialization and modernization strategy of Vietnam” propose a solution to thoroughly reform education and training system of Vietnam, creating new drives to quickly bring education and training system of Vietnam to the level of advanced countries in the region if Vietnam does not want to lag behind other countries, first of all countries in the ASEAN. Accordingly, education and training system of Vietnam must shift from providing knowledge to training and fostering thinking methods, problem solving methods, self-training capability, adaptability and creativity; gradually shift to open models of education and training under approaches of life-long study and continuous improvement of knowledge and skills to meet requirements of production and business. Vietnam should raise the number of students per 10,000 people to at least that of advanced countries in ASEAN. Vietnam should reasonably apply scientific and technological advancements, make use of all potentials, create drives for developing education and training, foster and make good use of talents in order to develop knowledge economy. Vietnam must proactively access and actively apply advance education and training models of the U.S., the U.K., France and Singapore in creative manners. Expanding forms of cooperation and collaboration with foreign universities to train high quality human resources according to international standard models is also a must. Last but not least, it is necessary to train and improve English communication competence and professional competence. These are the keys to develop knowledge economy in Vietnam.

3. Contents

3.1. Method

On the basis of surveying current status of awareness and results of carrying out roles of education and training in the development of the knowledge economy in Vietnam of university lecturers in provinces in the North of Vietnam, with a sample of 500 lecturers aged from 25 to 50 in 10 universities in Hanoi, this research is conducted using methods of dialectical materialism and historical materialism, and other methods of: analysis and synthesis, generalization and abstraction, logic and history, systematization, comparison and proof. Specifically, the author uses questionnaire and in-depth interviews while conducting field surveys and investigations in order to assess and sort levels of awareness of university lecturers of education and training in the development of the knowledge economy in Vietnam. That is aimed at help them assess their own level of awareness by e-level scale: very poor, poor, average, fair, good.

3.2. Roles of education and training in the development of the knowledge economy in Vietnam

Assessing education and training from systematic angle, we consider that education and training is a field of social life, is a system of pedagogical and scientific research viewpoints, organizations and activities, aimed at comprehensively developing qualities, competency and improving personalities to meet requirements of socio-economic development, national defense consolidation and national protection in each period of history. As

such, education and training is a field of social life, existing and developing in specific historical conditions, in which socio-economic field play determinant role. Therefore, education and training is a product of social life, reflecting degree of development of the society corresponding to historical conditions of specific historical period.

Education and training in the development of the knowledge economy in Vietnam is a system of pedagogical and scientific research viewpoints, organizations and activities, aimed at comprehensively developing qualities and competency, improving personalities of Vietnamese people, and improving quality of human resources to be capable of being actors to creatively apply modern scientific and technological knowledge on production, business and socio-economic development for the goal of: rich people, strong country, democracy, justice, and civilization

Actually, the roles of education and training in the development of the knowledge economy in Vietnam are to serve as bases, foundation, prerequisites and important drives that determine the development of the knowledge economy in Vietnam. On the basis of improving comprehensive quality of Vietnamese people in terms of competency and personality, it is necessary to apply adequately strong solutions to make Vietnamese people become actors acquiring, utilizing and flexibly applying modern scientific and technological knowledge on conducting production and business, securing socio-economic development, consolidating national defense and security, and guaranteeing that Vietnam has sufficient conditions to join in globalization and international integration and raise prestige and positions of Vietnam in international arena.

3.2.1. Summarized results of indicators of implementing roles of education and training in the development of the knowledge economy in Vietnam

3.2.1.1 Achievements:

By summarizing indicators of roles of lecturers in training human resources, especially high quality human resources, for the development of the knowledge economy in Vietnam nowadays, the author draws a panorama of the implementation of roles of education and training in the development of the knowledge economy in Vietnam.

(1) In the recent years, education and training of Vietnam has made important contributions to creating high quality human resources to meet demands of the development of the knowledge economy in Vietnam. This human resources is continuously improved in terms of quality and quantity, and diversified in terms of occupational structure. Since 2016, the rate of trained labors of all qualification levels have been increasing, “from 40% in 2010 to 51.6% in 2015; vocational education for rural labor has been improved, in the period of 2010 - 2015, more than 4.1 million of rural labors were trained according to Project 1956” [10, pp. 228]. Higher education and vocational education are improved in terms of both scales and quality. The number of labors with diplomas/certificates is increasing, “In quarter 3/2017, number of trained workers aged 15 and over who have certificate for three-months (and above) training is 12.07 million people, going up by 649 thousand people (5.68%) compared to quarter 3/2016. Of which, a significant increase is observed in the group of elementary vocational training (18.63%), followed by the group of university and postgraduate (8.91%); there is a decrease in the group of secondary vocational training (-3.74%) and college (-0.28%).” [18, pp. 2].

Remarkably, postgraduate education and training is improved significantly “in 2012, the number of new Doctors and Masters were 4.000 and 50.000 respectively; in 2014, our education system was increasing scope of postgraduate training, of which the number of new Doctors and Masters to be trained was increase by 7% and 5% respectively.” [11, pp. 37 - 43]. Also, doctoral training programs in foreign countries and doctoral training programs under Project 322 and Project 911 of Ministry of Education and Training have been being implemented. “As of the beginning of 2014, Vietnam has 130 Doctoral training education institutions and more than 150 Master training education institutions; the education system have trained about 20 - 25 thousands of new Masters and thousands of new Doctors” [11, pp. 39].

(2) Education and training of Vietnam has initially played a role in improving quality of human resources with professional capacity, occupational practice capacity, adaptive capacity, research capacity and professional development potentials. A number of training fields of Vietnam have reached regional and international levels. At the 11th ASEAN Skills Competition, Vietnam sent 44 candidates at 22 profession, and finally ranked the third out of 8 countries attended the Competition. Of the professions, Vietnam got 7 gold medals in: Electronics, Bricklaying, Metratronics, Mechanical engineering design, Industrial automation, CNC maintenance. In addition, Vietnam got 5 Silver Medals, 4 Bronze Medals, and 16 Medallion for Excellence [12].

3.2.1.2 Limitations and drawbacks to be resolved

Education and training for human resources of Vietnam, especially high quality human resources, is currently a “bottleneck” hindering the development of the knowledge economy in Vietnam. This is clearly shown in 3 aspects of: Quantity, quality and structure

(1) Regarding quantity: Trained labor only accounts for 50% of total labor force of Vietnam and is making the least contribution (less than 20%) to economic growth of Vietnam. According to statistics of Ministry of Education and Training of Vietnam, the number of student per 10000 people in Vietnam (as of

November 2016) is 200 students per 10000 people, which is much lower than that of other countries having already been developing their knowledge economy in Asia like South Korea or Singapore. Researching experience of these countries, we find that in order to develop knowledge economy, human resources must be of high quality. And that the number of student per 10000 people should be from 300 to 400 per 10000 people [13, pp.107]. Regarding the number of Professors and Associate Professors in Vietnam nowadays, we find that “according to statistics of Ministry of Education and Training of Vietnam in the school year 2014 - 2015 in terms of total number of university students and lecturers (including Professors and Associate Professors), the population of Vietnam is more than 90 million people, so there are only approximately 0.06 Professors and 0.4 Associate Professor per 10000 people, 5.8 Professors or Associate Professors per 100 university lecturers, and 0.2 Professors or Associate Professors per 100 students” [14].

Currently, in the whole of Vietnam there are nearly 168 thousands people involving in scientific research and development. Comparing the rate of people involving in scientific research and development per 10000 people of Vietnam with that of other countries in ASEAN and in the world, we find that: “Although the average rate of researchers per 10000 people of Vietnam has been increasing in the recent years, as comparing with that of other countries in the region and in the world, that of Vietnam is still low (being 1/5 of that of EU, 1/6 of the U.S., 1/4.5 of Russia, 1/10 of South Korea; regarding ASEAN countries, that of Vietnam being 2/3 of Thailand, 1/3 of Malaysia, and 1/10 of Singapore)” [15, pp. 177].

The fact shows that currently a number of key fields of knowledge economy of Vietnam, for example IT sector, the number of trained labor is still less than demanded. “The number of jobs in IT sector is increasing by 47% annually, but the labor force of the fields only grows by 8% ... each year Vietnam needs about 80000 to 100000 IT workers, but each year there is an average of 30000 students graduated from IT training courses” [16]. Training quality of education and training institutions of Vietnam cannot keep pace with demands for IT human resources of enterprises.

It is also worth noting that a number of other key sectors of knowledge economy of Vietnam, for examples Biotechnology, new materials, etc., also hindered by similar situations. Currently, KEI of Vietnam is very low, “comparing with other countries in the region, KEI of Vietnam is lower than 1/2 of that of newly industrialized countries ... much lower that of Malaysia, Thailand, China, Philippines” [17, pp. 54]

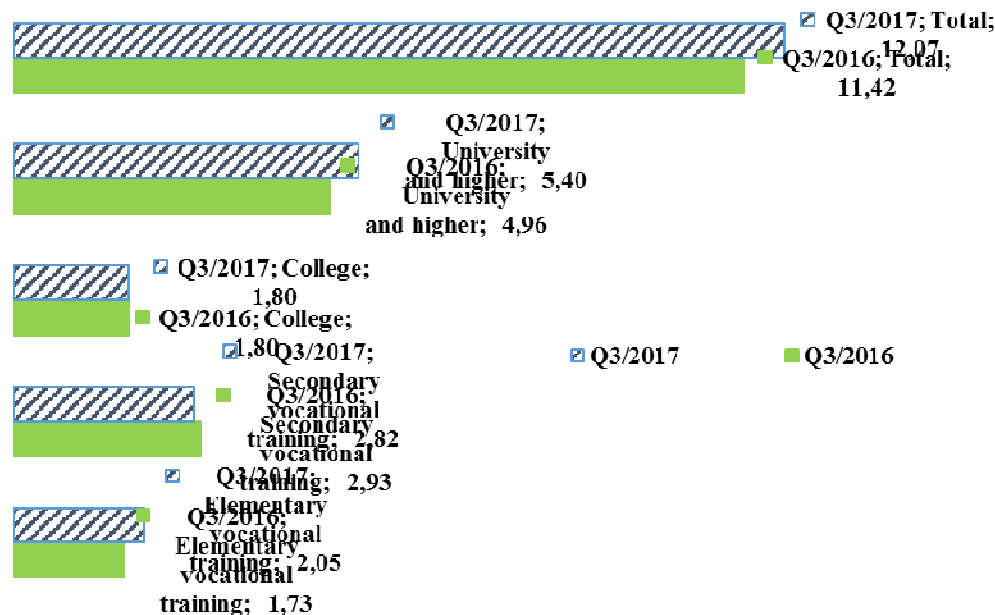
(2) Regarding quality, educational levels of Vietnamese people are lower than requirements of the development of the knowledge economy. The rate of pupils aged from 15 - 18 years old with high school diplomas is just 89,46%, and the size of trained labors with diplomas/certificates only accounts for nearly 80% of labors aged 15 years old and above. Currently, 72% of IT students do not have practical skills, and 42% do not have group working skills [16]. It is shown that in Vietnam employers are always “thirsty” for high quality human resources in spite of the fact that they have many good preferential policies. Although lots of new bachelors and engineers are trained, the unemployment rate of labors with university certificates are still high, as of 3rd quarter of 2017, “The number of unemployed people with university degree and higher is 237 thousand people, an increase of 53.9 thousand people compared to quarter 2/2017; the unemployment rate of this group is 4.51% (last quarter was 3.63%). There are 84.8 thousand people unemployed in the group of college level, increasing by 2.2 thousand people compared to quarter 2/2017; the unemployment rate of this group slightly decreases to 4.88% but it is the highest rate. The group of secondary level has 95.5 thousand unemployed people, increasing by 2.8 thousand people; its unemployment rate is 3.77%.” [18, pp. 6].

In general, based on a 10-point scale, Vietnam’s labor quality is only 3.79 points, ranking 11 out of 12 Asian countries surveyed by World Bank in Asia, while South Korea’s score is 6.91; India’s is 5.76; Malaysia’s is 5.59, and Thailand’s is 4.94. Vietnamese labor force is weak in quality, lacks dynamism, creativity and industrial work style...” [19] This results in the fact that “labor productivity of Vietnam is 17 times lower than that of Singapore, 11 times lower than Japan’s, 10 times lower than Korea’s, and is just 1/5 of Malaysia’s and 2/5 of Thailand’s ... meanwhile less developed economies have higher labor productivity growth rates than Vietnam, for example in 2008 Lao’s labor productivity was 0.93 times of Vietnam’s but has caught up with Vietnam in 2015, or Myanmar’s labor productivity was 0,51 times of Vietnam’s, but has reached 0.55 times of Vietnam’s in 2015.” [20]. These facts show that competitiveness of Vietnam is weak and the risk of further economic lag is quite clear.

(3) Regarding training structure in terms of technical qualifications, this structure in Vietnam is not reasonable. Survey results show that, of the 12.07 million people who have certificates/qualifications from elementary and above, the number of people having university and higher certificates/qualifications is 5.4 million, college certificates/qualifications 1.80 million, secondary vocational training 2.82 million, and elementary vocational training 2.05 million [18, pp. 2].

Figure 1. Number of workers by technical expertise, quarter 3/2016 and quarter 3/2017

Unit: million people



Source: GSO (2016, 2017), *Quarterly Labor Force Survey*.

This reflects a serious imbalance in the structure of trained labor between higher education and vocational training in Vietnam. In order to develop market economy, it is necessary to develop the number of labor having university or higher degrees, as well as to maintain a reasonable training structure by technical and professional qualifications. Experience of developed countries show that the suitable labor structure by technical and professional qualifications for the development of the knowledge economy is: 1 labor having college or higher qualification per 5 labor having secondary vocational qualifications and 10 technical workers. In order to reach this ratio, education and training of Vietnam must make further reform in university education and vocational education, of which learners directly apply scientific advancements on production and life. In fact, it is shown that in the education system of Vietnam, the number of business and management sub-disciplines being taught at the moment is 403, followed by teacher training 363, humanities and social sciences 280, technical 232, computer and information technology 150, meanwhile that number of agriculture, forestry and fisheries is only 116, production and processing 47, social services 16, translation services 12 [21]. This structure is not suitable with the development of the knowledge economy in Vietnam.

Therefore, in order to make use of advantage of an agricultural country, Vietnam must focus on developing high quality agricultural sector to meet high demands on human resources of this sector and should not let this sector in current situation of human resources shortage. This is a great obstacle preventing Vietnam from developing its advantageous production sector compared to other countries in ASEAN and in the world.

Training of human resources having high quality and serving as a booster for the development of knowledge economic sector also has a number of limitations and drawbacks. Currently, the number of students graduated from technical education fields is too low (only about 40% of the total of graduated students), and the remained are from economic - management - social sciences education fields [22]. This results in the fact that Vietnam currently does not have sufficient number of scientific and technological human resources.

As of February 2017, Vietnam has 235 universities under management of Ministry of Education and Training, and more than 1000 colleges, vocational schools and vocational centers under management of Ministry of Labor, War invalids and Social Affairs (excluding educational institutions of the armed forces), which show that the scale of Vietnam's education system is very large. In spite of being so large, Vietnam's education system

still cannot meet demands on high quality human resources for the development of the knowledge economy. Labor force is young and plentiful, but is not appropriately trained and utilized, therefore “labor force is making the lowest contribution to economic growth, at less than 20%, meanwhile in other ASEAN countries contribution from total factor productivity is 35-40%, and that in other developed countries is 60 - 70% [23, pp. 53].”

This results from the fact that quality of education and training in Vietnam still cannot meet requirements of human resources supporting the development of the knowledge economy; training and human resources planning are overlooked. Educational institutions now only training what they are specialized in, and fail to catch up with development trend of new education - training in developing creativeness, personalizing training programs and applying new learning technology of machine learning, deep learning and artificial intelligence to acquire new knowledge.

This is the bottleneck that hinder the development of the knowledge economy in Vietnam at the moment and in the future; weaknesses of education - training quality for human resources, especially high-quality human resources, are serious problems for the development of the knowledge economy in Vietnam.

3.2.2. The combined data of the indicators on lecturers' awareness of the role of education and training in the creation and transfer of modern scientific and technological achievements to meet requirements of development of the knowledge economy in Vietnam.

Education and training play important roles not only in the development of the knowledge economy, as viewed from the angle of improving people's awareness, training human resource and fostering talents, but also in the development of science and technology on the basis of the creation and transfer of modern scientific and technological knowledge into all fields of social life so that, together with education and training, development of science and technology can implement their roles of being “a top national policy”. Therefore, development of education and training always is always accompanied by the development of science and technology, which is the key to speed up the country's industrialization and modernization, develop knowledge economy, and help Vietnam reach to the advanced level of the region and the world.

3.2.2.1 Advantages

Along with education and training, scientific research and technology transfer are increasingly emphasized, especially in higher educational institutions and vocational educational institutions in Vietnam in recent years. These are functions and tasks of educational and training institutions specified in Education Law (supplemented and amended in 2009), Law on Higher Education (2012) and Law on Vocational Education and Training (2013). Currently in Vietnam, educational and training institutions have established various research and development organizations, “of the total of 1055 scientific and technological organizations of the whole country, those of higher educational institutions (including academies, universities and colleges) take up 32%, the number of organizations specialized in research and development takes up 47,9%, and scientific and technological service organizations takes up 20,1%” [24, pp. 73]. Regarding human resources, these organization employ “74.217 people working in fields of research and development, taking up 45% of the total number of people working in fields of research and development of the whole country” [24, pp. 86]. These are favorable conditions for educational and training institutions to boost scientific research and technology transfer, apply scientific and technological knowledge on production and business, and boost the development of the knowledge economy in Vietnam.

Regarding this issue, the model of Da Nang University is a good example. Over the years, “University of Da Nang has been granted 20 certificates / intellectual property proprietary certificates, published thousands of articles in international journals, of which more than 200 are ISI-listed, and deployed more than 200 research projects per year; Particularly the College of Technology, University of Da Nang, in 2015 published 35 international articles. Scientific and technological activities of Hue University in the period of 2009 - 2014 created 153 technology products, of which 20 have commercial potential to serve socio-economic development. From Thai Nguyen University, the number of scientific works published in and out of Vietnam continuously increases from 2010 to 2015, specifically in Vietnam 2,654 works, and international 429 works, of which 197 works in the lists of ISI, ICI; Can Tho University annually carries out nearly 300 scientific research projects at all levels, including about 30 international cooperation projects, with about 1,200 publications from scientific research works, more than 100 articles published in international journals [25, pp. 5].

Scientific and technological research and applications on industry, agriculture and services are making important contributions to socio-economic development. Among those are key fields of knowledge economy, for examples: Biotechnology, information technology, new material technology and high technology, which are being developed to reach levels of ASEAN and of the world. These contributions contribute to accelerate industrialization, modernization and development of the knowledge economy. It can be confirmed that, education and training have great roles in the development of sciences and technology and development of the knowledge economy. They are the very start to create new values, new products, and new ways of doing things. As such, education and training become an important field in the process of developing knowledge economy in Vietnam

3.2.2.2 Difficulties and challenges

In general, the roles of education and training in the creation of new scientific and technological knowledge in Vietnam do not commensurate with their existing potentials and strengths. Therefore, education and training have not met requirements of development of the knowledge economy, and have not become a strong drive of development of the knowledge economy. Applications of scientific and technological advancements on production, business and other fields of social life are still hindered by a number of limitations and drawbacks. Scientific and technological levels of Vietnam are lagging behind that of other countries in ASEAN and in the world. The scientific and technological gap between Vietnam and other countries in the region and in the world is wide. According to “OECD Reviews of Innovation Policy Science, Technology and Innovation in Viet Nam” released in 2014 by the World Bank and OECD, “Current science, technology and innovation (STI) capabilities are weak and the national innovation system is in a nascent, fragmented state. Research and development (R&D) is still a peripheral activity, both in the business and the public sector” [26]. According to Good Country Index, Vietnam ranks 128th out of 163 countries in terms of science and technology [27]. This is a serious challenge to the development of the knowledge economy in Vietnam nowadays. Also, imported technology has not been adapted and upgraded efficiently. Productions of various commodities effectively supporting production, business and life have not been established. Vietnam is still a technology importer. This fact proves that education and training have not been linked with scientific research, production, business and demands of labor market. Therefore, competitiveness of Vietnam’s economy is far lower than that of other countries in ASEAN. This is the results of various causes, of which the most remarkable ones are: Vietnam does not have a clear vision of education and training; attention on and awareness of roles and importance of sciences and technology are low; Investment in scientific activities is still limited and spreading, lack of synchronous planning, lack of technology nurseries and pilot production centers. At present, there are 16 state-invested laboratories equipped with state-of-the-art facilities; meanwhile, the number of laboratories specialized in technological development and application and managed by universities is only 3. At the same time, the contingent of scientific and technological staff in educational and training institutions is limited in terms of number and qualifications, unsynchronized in structure; The percentage of lecturers with a PhD qualification is less than 20%. The relationship between education and training institutions and scientific and technological research institutions in Vietnam is still very limited. Also, the renewal of the curriculum, content and methods in education and training has not really brought about results as expected by the society, and there has been no breakthrough in the quality of education and training. Currently, in Vietnam there are “35 advanced programs in 23 training institutions, 16 high quality engineer programs in accordance with French standards in 4 training institutions; 50 Professional Oriented Higher Education and nearly 200 high-quality training programs in other training institutions” [28, pp. 167].

In short, the roles of education and training has not been fully realized in the development of knowledge economy in Vietnam. This is a challenge that force Vietnam’s leaders and the education and training sector to make sound decisions to fundamentally reform the Vietnam’s education system. This is a prerequisite for the development of knowledge economy in Vietnam nowadays.

4. Issues related to implementing roles of education training in the development of the knowledge economy in Vietnam

From the analysis of the current role of education and training in the development of knowledge economy in Vietnam, we believe that in order to develop knowledge economy in Vietnam in the coming years, it is a must to deal with the followings:

4.1. Proper awareness and decisive actions of actors are prerequisites for the promotion of the roles of education and training institutions in the development of knowledge economy in Vietnam.

4.2. Another action to be taken is to resolve conflicts in leading and directing the implementation of the motto and the view of education and training as “a top national policy”, investment in education and training is investment for development. From that perspective, Vietnam must concentrate all resources to develop education and training on the basis of “radical and comprehensive reform of education and training”, “creating a strong move in human resource development”. [29, pp. 219], which is the determinant of success or failure in the development of knowledge economy in Vietnam.

4.3. Expanding the size of schools and classes must go together with raising the quality and efficiency of education and training of all levels, especially the training of human resources for the development of knowledge economy in Vietnam. In particular, it is necessary to fulfill the universal requirement in developing knowledge economy that the number of trained workers must reach 70% or more.

4.4. Promoting scientific research and technology transfer must be closely linked to radical and comprehensive reform of education and training, raising the quality of human resources to meet the requirements of international integration and development of knowledge economy. .

5. Essential measures to promote roles of education and training in the development of the knowledge economy in Vietnam nowadays

From the above analysis and discussions, we believe that in order to develop knowledge economy in Vietnam, the following solutions should be implemented well:

5.1. To build Vietnam's education and training philosophy in the period of globalization, international integration and development of knowledge economy. This is especially important, determining whether Vietnam goes in the right direction or deviates from the proper path, which may lengthen the process of national industrialization and modernization.

5.2. To enhance the State's management role in education and training, to properly carry out the State's public power to manage and regulate the organization and operation of the national education system in order to achieve specified objectives of education and training; In particular, to properly carry out the formulation of strategies, schemes, plans, and policies of education and training development in line with realities of knowledge economy development in present conditions of Vietnam. In particular, the development of education and training strategies must be linked to strategy of human resource development for the country in general and human resource development strategies for each sector and each field. At the same time, the legal system in the field of education and training must be improved.

5.3. To radically reform contents and forms and to develop curriculum and methods of teaching and training in the direction of comprehensive development of quality and capacity of learners. Together with that, to well organize the research on and reception of quintessential experiences of countries with advanced education and training systems in the world suitable to the specific conditions of Vietnam; To attach importance to the formulation of textbooks, course books and teaching and learning materials in order to realize programs and contents of education and training.

5.4. To reform education and training methods to adapt to the requirements of developing qualities and capacity of learners, resolutely renounce passive and imposing methods of training; to help learners know how to learn and take self-study as the core; to build a learning society.

5.5. To build a contingent of teachers and educational and training administrators in the direction of standardization, modernization and socialization in order to meet the requirements of developing knowledge economy in Vietnam.

5.6. To improve capacity of pedagogical institutions specialized in training teachers and administrators in education and training in the country, in combination with overseas training, especially in advanced universities in the world.

5.7. To formulate, supplement and improve mechanisms and policies, create motives for the staff of teachers, scientific and technological officials to work effectively; to promote the roles of leading experts and pedagogic talents.

5.8. To develop advanced and modern education facilities and a dignified and democratic education and training environment in order to bring into full play the roles of education and training in the development of knowledge economy.

5.9. To raise quality and efficiency of scientific research and technology transfer activities in higher education institutions, vocational training to create boosts for the development of knowledge economy in Vietnam.

6. Factors determining roles of education and training in the development of knowledge economy in Vietnam

The promotion of roles of education and training in the development of the knowledge economy in Vietnam is determined by the following factors:

6.1. The education and training philosophy and the State's management role in education and training. This is the leading factor determining the roles of education and training in socio-economic development in general and the development of the knowledge economy in Vietnam in particular.

6.2. Promoting the role of education and training in the development of the knowledge economy in Vietnam now depends on the objectives, curriculum, content and methods of education and training. These are essential factors determining roles of education and training in the development of knowledge economy in Vietnam

6.3. Promoting roles of education and training in the development of the knowledge economy in Vietnam nowadays depends on the staff of teachers and education managers. These are key factors determining roles of education and training in the development of knowledge economy in Vietnam.

6.4. Promoting roles of education and training in the development of the knowledge economy in Vietnam nowadays depends on infrastructure and environment of education and training. This is the factor determining roles of education and training in the development of the knowledge economy in Vietnam, especially democratic, disciplinary and ethical education and training environment of teachers and learners.

7. Conclusions

In the development of the knowledge economy in Viet Nam, education and training have great roles and missions to improve people's knowledge, train human resources, foster talents, build and develop Vietnamese people in order to receive and use modern science and technology but also to create new scientific and technological knowledge for the development of the knowledge economy. Therefore, radical and comprehensive reform of education and training is considered as a fundamental breakthrough, a key element in the development of the knowledge economy in Vietnam today.

Promoting roles of education and training in the development of the knowledge economy in Vietnam now requires education and training to improve quality of human resources, foster talents for the country, create new scientific and technological knowledge to fulfill its mission: Applying achievements of the industrial revolution 4.0 on the development of the knowledge economy in Vietnam. That is the best way to achieve the goal of “rich people, strong nation, democratic, equitable and civilized society”.

In order to promote roles of education and training in the development of the knowledge economy in Vietnam, it is necessary to carry out synchronously and comprehensively a number of measures. Of the measures, to build Vietnam's education and training philosophy in the period of globalization, international integration and development of knowledge economy plays specially important role. The next measure is to radically reform contents and forms and to develop curriculum and methods of teaching and training in the direction of comprehensive development of quality and capacity of learners, and to build a contingent of teachers and scientists capable of meeting requirements and tasks of the development of the knowledge economy.

Promoting roles of education and training in the development of the knowledge economy in Vietnam is a scientific issue in the cause of reform, building and protecting Vietnamese Fatherland. Therefore, it is necessary for leaders, managers and scientists to continue to conduct researches, summarize reality and experience and develop theories and philosophies of Vietnam's education and training, which are premises the success of the development of the knowledge economy in Vietnam.

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