Training and Developing It Human Resources in Thanh Hoa Province

Nguyen Xuan Duong[*], **Le Quang Hieu**

Deparment Business Administration, Faculty of Economics - Business Administration Hong Duc University, Viet nam
*Corresponding author: nguyenxuanduong@hdu.edu.vn

Abstract Information technology is a collection of scientific methods, means and tools of modern technology - mainly computer and telecommunications technology - to organize exploitation and efficient use of rich and potential information resources in all human and society's activities. IT development is a priority aspect in the development strategy of science and technology in our country in industrialization and modernization period. Recognizing the importance of human resources factor, all individuals and organizations need to pay attention more strongly to training and developing human resources - it is a decisive factor for a country, an organization, a locality to exist and develop in the period of competition and integration. From the above reasons, I have boldly chosen the topic: "Training and developing IT human resources in Thanh Hoa province" as my reseach.

Keywords: training and developing, human resource, IT

1. Concept, Structure and Role of Human Resources

1.1. Concept of Human Resources

Human resources are resources of people and researched in many aspects, so there are many different concepts of human resources. Human resources are understood as resources of people of a country, a territory (region, province, etc.), are a division of resources to mobilize, manage to participate in socio-economic development process such as physical resources, financial resources. Human resources are skilled qualification, knowledge and capabilities of entire human life, actual or potential for socio-economic development in a community. As a factor of socio-economic development, human resources are understood in a narrower sense; it is the ability of social workers. [1]

With this understanding, human resources are equivalent to labor or social resources. There are two types of human resources:

Social human resources (also known as social labor): There are many concepts of social human resources. However:

- Social human resources are a part of working-age population having working capacity. Working age is the age prescribed by law that all citizens have capacity to work within that age; they are considered the country's labor force. [1]

- Social human resources are considered on the social perspective of quantity and quality:

+ The number of human resources depends on regulation of working age. Each country has its own regulations on the minimum and maximum age for labor. [2]

Currently, most of provisions of the minimum age are 14 or 15; in many countries, even the world labor organization also does not provide the maximum age limit. In our country, social human resources including people in working age, able to labor, and child labor, and elderly labor. In general, human resources are understood as a part of the population in certain age prescribed by law, who has ability to work. Working age is specified in different countries. According to the Vietnam Labor Code, working age of men is from 15 to 60 years old and working age of women is 15 to 55 years old.

+ Quality of social human resources is expressed in physical health, mental health, attitude, motivation, sense of labor. Human resources encompass unity of society capacity of human (physical, mental power, personality) and the dynamism of human.

Consistency is reflected in the process of turning human resources into human capital. Three aspects: physical health, mental, mental power have close and unity ties, they constitute the quality of social resources. In particular, physical health is foundation for intellectual development, a means to transmit knowledge, human wisdom into practical operation. Consciousness, mental, moral behavior is a factor affecting metabolic activity of physical, intellectual to practices. Intelligence is crucial factor to quality of human society. [6]

In the course of labor, quality of social human resources depends on the quantity, quality of tools, machinery equipped for employees. [1] The technological level sets requirements and changes employees' level. This is expressed

clearly in countries with less developed economies implementing industrialization and modernization by way of transferring, importing advanced technology. Science and technology have been growing, the nature of socialization of productive forces has become higher, the quality, especially intelligence of human resources is increasingly important. Social human resources in the full sense must be understood that it is the most important factor of production forces, at the same time it is an important factor of production relations. Therefore, the relationship between productive forces and production relations depends much on quality of human resources. When production forces have society nature, production relations become more complete and science is increasingly becoming productive forces, the internal functions and external area of human resource categories is expanding.

Human resources for economic development, including: strategies and policies planners; researchers; managers; technologist; engineers; technicians and skilled technical workers. In particular, scientific and technological advances have changed workers. Forming white collar workers or intellectuals is growing and moving into the middle class. [6]

In respect of human resources, our Party has been identified: "Highly intellectual, skilled, good-quality labor force have been trained, fostered and promoted by an education associated with a modern science and technology."

Therefore, human resources that we consider are human resources, labor potential in a certain time. Human resources are the most important endogenous dynamics, it includes physical power, mental power, spiritual power, and the interaction between individuals in the community, it is labor potential of a sector, an organization, a locality, a nation in the organic unity of society capacity because of social dynamics of people, groups, departments, organizations, locality, regions, nations. The unity is reflected in the process of turning human resources into human capital to meet requirements of social development; these resources need to be used properly, reasonably and effectively to promote all endless potential energy. [6]

Human resources in an organization

Human resources in an organization are the labor force of each unit, organization or agency. In other words, human resources in an organization are the total number of people (officers, servants, employees, etc.) in the list of an organization, operating under the organization's mission and they are paid by organization. [6]

Human resources of organization are people who form team of employees in an organization and implement organization's activities; they signed a contract with participation of financial and material resources of the organization. Function of organization is to use methods, policies and measures to improve and enhance quality of human resources in order to meet requirements of human resources for social- economic development in each development period. In order to efficiently manage human resources, apart from the scale of human resources side, the more important issue is to determine structure of human resources correctly. [6]

1.2. Structure of Human Resources

Human resource structure (also called labor structure) within an organization is the relationship between the quantity and quality of human resources in an organization. A reasonable labor structure is guaranteed factor to implement their goals. [1] There is some type of structures which is often mentioned:

Firstly, it is structure of human resources according to function: human resources in an organization, including management officials and executive staff. In management position, there are many categories: organizational leadership, component leadership, employees performing professional management (organizing, planning, financing, etc.).

Secondly, it is structure of human resources according to qualification: this is the kind of structure which attracts the most attention because it is the quality of human resources. This structure is often analyzed according to the criteria: no training, primary, secondary school, college, university. A reasonable qualification structure is correspondence between functions and tasks undertaken by the official and professional qualifications of that official. [6]

In addition, to know how to manage and exploit potential of human resources in an organization, it is also interested in analyzing structure of workforce by age (age groups) and gender. In organizations, it is also interested in structure of vocational training under the system set out in the national education system.

1.3. Role of Human Resources

Human resources are resources of people and are one of the important resources of the socio-economic development. The role stems from the role of human factor. Any development process will need to have motivation, but only human resources can create motivation to develop and other resources want to promote, they have to go through human resources.

Since ancient times, people used manual tools and resources by themselves to create products to satisfy their own needs. As production grows, assignment of labor is growing and cooperation becomes more closely, people gradually work on machinery and equipment, make changes in the nature of work from manual labor to mechanical labor and intellectual labor. Until modern science and technology at the present, we can not leave human resources by the following reasons: people created machinery and equipment, human dominated natural by knowledge and wisdom; modern machinery and equipment, if without people's control, inspection, impact, they are just inanimate stuff. Only the impact of people can put them into operation, to promote ability of machinery. The research and development of countries have confirmed the decisive role of human resources for socio-economic development in general and the process of industrialization and modernization in particular. [6]

Considering human factor as the basic resource of socio-economic development, UNESCO said that "man is standing in the center of development; it is an agent and purpose of development". In the theory of economic strengthening it has noted that "human capital is knowledge and skills that workers acquire through education and training process in the labor process." "The human investment in improving quality of life of each individual to improve living standards of the entire society and thus it is possible to increase labor productivity." It is

important verdict which Asian countries have adopted in recent decades. The starting point of these countries is poor countries, they only have large labor and cheap labor, but lack skilled labor. They can not carry out industrialization and modernization. They have chosen path of investment in improving human resources' quality, highly qualified human resources is a key motivation for industrialization and modernization in these countries. In our country, being aware of dynamic role of human resources for industrialization and modernization process of the country, our Communist Party has given direction: "promotion of human factor is basic element for rapid and sustainable development ".

2. Characteristics of IT Human Resources

There are many different concepts of IT human resources, according to IT Association of America, IT human resource is workforce performing tasks such as research, design, development, application, management and support information systems based on computer, particularly software applications and computer hardware application (Computing Research Association, 1999).

In view of Decision No. 05/2007/QD-BTTTT, dated 26/10/2007 of Ministry of Information and Communications, "IT human resources including manpower working in the telecommunications business, industrial IT enterprises, human resources for IT applications, human resources for training IT, electronics, telecommunications and people using IT applications.

In limited research, the topic using IT human resources definition of IT Association of America, IT human resources divided into 3 groups that are IT human resources in the state management, IT human resources in IT industry and human resources for IT applications and training.

With the unique characteristics of the IT industry, IT human resources have main features as follow:

2.1. Young Workforce

Because the IT industry is a new industry compared to other industries such as automobile manufacturing, engineering, and textile and until the present time, IT just begins to develop in a number of developing countries so that the IT sector is considered young industry. In addition, the IT is high industry and continuous to develop so IT human resources mainly include young workforce. In the U.S., about 75% of IT workforce is under age 45 (Wane International report, no.2, 2004). In Vietnam, 50% of IT workers are under age 40 (Ministry of Education & Training and Ministry of Information & Communications, 2008).

2.2. Highly Qualified Human Resources

Characteristic of IT industry is constantly improving and changing technology so that workforce in this sector requires a high level of training and it is always trained to keep pace with the development of IT industry. According to U.S. Bureau of Labor Statistics, in 2002 in the U.S., 66% workers have bachelor's degree or higher (Wane

International report, no.2, 2004). Particularly in Vietnam, according to statistics of Ministry of Information & Communications, over 80% of workers in the software and digital content industry have IT qualifications from college (Ministry of Education & Training and Ministry of Information & Communications, 2008).

2.3. Human Resources Have Good Mathematical Thinking

IT foundation bases on mathematical thinking, so, working in IT industry requires good mathematical thinking. In Vietnam, many IT training centers maintains mathematics faculty or mathematics information subject.

2.4. Dynamic, Creative Workforce and Passion for Research

IT industry is highly integrated; IT industry itself has infiltrated almost every other industry, so IT workers do not have borders. IT labors virtually present in most areas from agriculture, tourism, culture, services, and industry.

Besides, with the constant change of technology, it requires workers in IT industry must have the passion with job to research and innovate continuously.

2.5. Human Resources Have High Labor Productivity

IT workers have high productivity, but this productivity is very different between various skilled labors, especially those working in the field of software. In software industry, a skilled programmer can have productivity 10 times than average workers (Computing Research Association, 1999). Therefore, a company having many employees, but productivity is not as high as a company having fewer employees, but they are good employees. So businesses often have software campaign in the recruitment of skilled and experienced programmers.

2.6. The Dominance of Male Workers in the IT Workforce

In the U.S. male workers in IT sector accounts for 65% (ITAA, 2003 cited in Wane International report, no.2, 2004) [21]. In Nepal, the rate of male workers in IT industry accounts for 86% (Prof. Lal Chhabi Gajurel & Rajib Subba, 2000).

Men not only account for large proportion of labor in the industry, but also undertake important positions such as electronics engineer, computer system analyst, programmers. Meanwhile, women only take modest jobs such as import data, machine control, and operator. According to scientists, lacking educational opportunities, lacking creativity make women become marginalized in the IT industry.

2.7. Workforce Having High Foreign Language (English) Qualification

Because IT comes from the U.S. and develop in Western countries, so to learn, use and work with IT

requires workers to have a minimum level of English. Today, some countries have strong IT development such as Japan and South Korea. However, most of the new technology is instructed in English.

3. Research Methods

3.1. Determine Research Process

For a research process in accordance with the research content, firstly, the author studied and researched materials related to training and development and remuneration for IT human resources. This content is considered as the first step of the study. After studying relevant documents, the author built research process, as follows:

- **-** Determine research motivation
- Determine research objectives
- Summary documents related to the research topic
- Design framework
- Design Questionnaire (Total survey cards: N > m*5).
- Conduct surveys, investigation
- Collect primary information.
- Analyze and interpret data.
- Conclusion and proposed solutions
- To make contents of research issues logical and summary documents reliable and highly accurate, it is necessary to design content-related questions of the research topic, study and survey objects related to training and development and remuneration for IT human resources in Thanh Hoa province, some experts from sectors, associations in order to collect opinions of the aforementioned objects of study, feedback on the content of research questions.

- To measure factors relating to training and development and remuneration for IT human resources in Thanh Hoa province, the research topic applied the two methods. First is quantitative research method applied for IT human resources in Thanh Hoa province. Second is qualitative research method applied for experts.

Research process is shown in Figure 1.

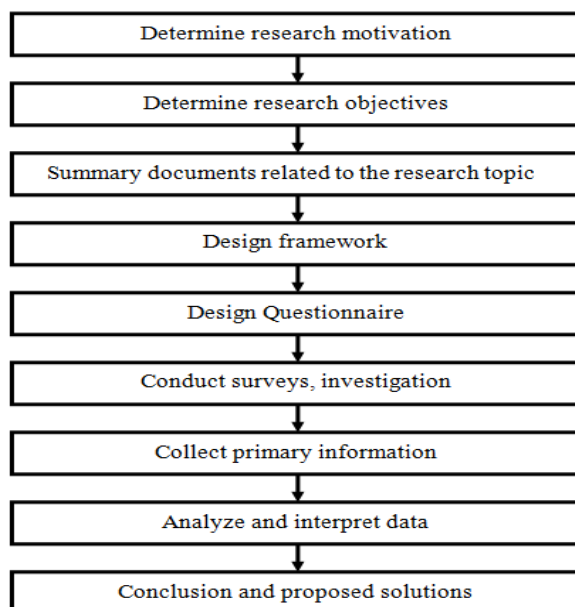**Figure 1.** Diagram of research topic

3.2. Determine Research Framework

This part includes contents:
- How to conduct;
- Contents of surveyed questionnaires;
- Surveyed objects;
- Distribution of surveyed cards;
- Accuracy and reliability of the data.

3.2.1. How to Conduct

Data identified in research of the topic plays a role as foundation to design questionnaires on factors affecting training and development of IT human resources in Thanh Hoa province. The questionnaires aim at human resources within working age group and experts of involved departments and agencies in Thanh Hoa Province. The survey was conducted to seek answers for posed research questions basing on practical experience of professionals. Survey conducted by answering questions in the survey table, which contains questions and instructs how to respond to available answers, provincial-level professionals and professionals at Association of Small and Medium Enterprises and Managers will study and respond by filling out the questionnaire table within 40 days. In addition to studying and answering questions in the questionnaire table, there are a number of ongoing unofficial discussions between experts and authors to edit or add some comments on such research.

3.2.2. Contents of Surveyed Questionnaires

Questionnaires focused on assessing the importance of factors which affect training and development of IT human resources in Thanh Hoa province. The questionnaires are designed to suit each surveyed objects and main research content of the subject. There are two types of questions, closed questions and open questions with 3 main contents.
- The first content aims at studying and selecting surveyed objects.
- For the second content, the author use five-point-scale question of Rensis level Likert scale to assess the importance of factors which affect training and development of IT human resources in Thanh Hoa province.
- For the third content, the author uses opened questions to further study the importance of factors which affect training and development of IT human resources in Thanh Hoa province.

3.2.3. Distribute Surveyed Cards

Content of the questions is designed in a questionnaire. To direct surveyed question contents to right surveyed objects, surveyed cards are transferred via guarantee letters to surveyed objects, managers, some experts, managers of sectors, departments, division in Thanh Hoa province with 200 cards and research time for these surveyed objects to answer such questions lasts 60 days.

3.3. Method of Statistical Analysis - Using SPSS Software

After screening 200 valid questionnaires of the aforementioned group of objects, the author use tools to

analyze, evaluate such as SPSS program, matrix method to run and handle data, the results bring about numbers we need to find. This is the basis to analyze, evaluate and provide solutions for the thesis.

- Quanlitative analysis
- Quantitative analysis
- Validity and reliability
- Mean
- Frequency
- Percent
- Anova

4. Research Results and Findings

4.1. Results from Analyzing General Information

Results from analyzing general information are described in the following table:

Table 1. Results from analyzing general information

			%
Gender	Male	61	47%
	Female	69	53%
	Total	**130**	**100%**
Qualification	Post-graduate	17	13%
	University	45	35%
	College, Vocational school	38	29%
	Other	30	23%
	Total	**130**	**100%**
Age	Under 32	43	33%
	From 32 to 45	52	40%
	Over 45	35	27%
	Total	**130**	**100%**

Through analysis of general information about gender, qualification and age of surveyed subjects, it can be seen that:

- Among 130 collected survey cards, 53% of surveyed objects is females, 47% of them is males. 13% of surveyed objects are with qualification of post-graduate, 35% of them with qualification of university, 29% of them with qualification of college, vocational school and 23% of them with other qualification.
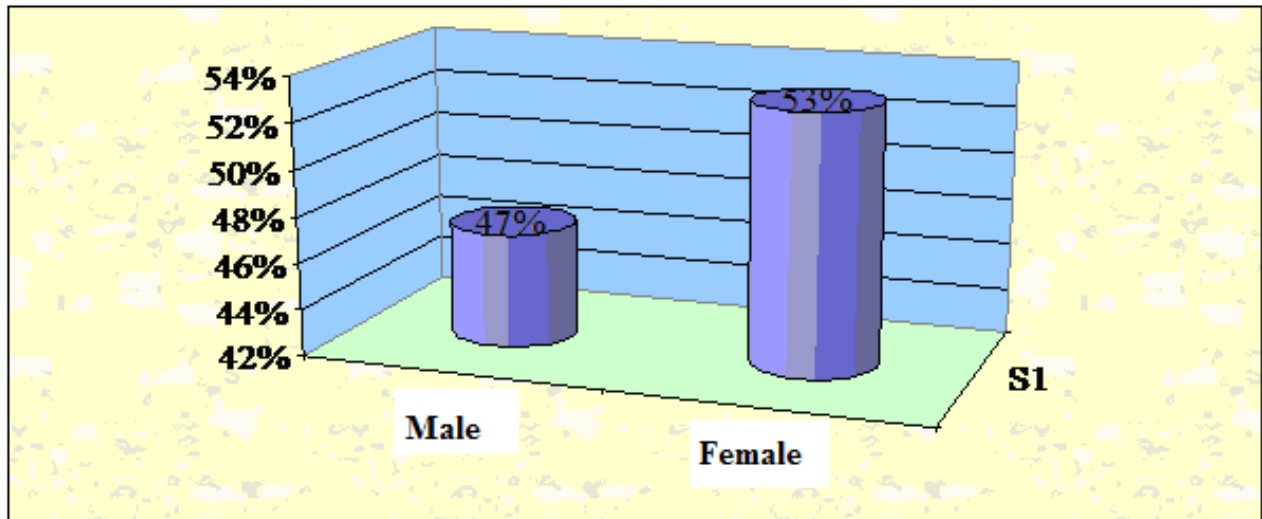

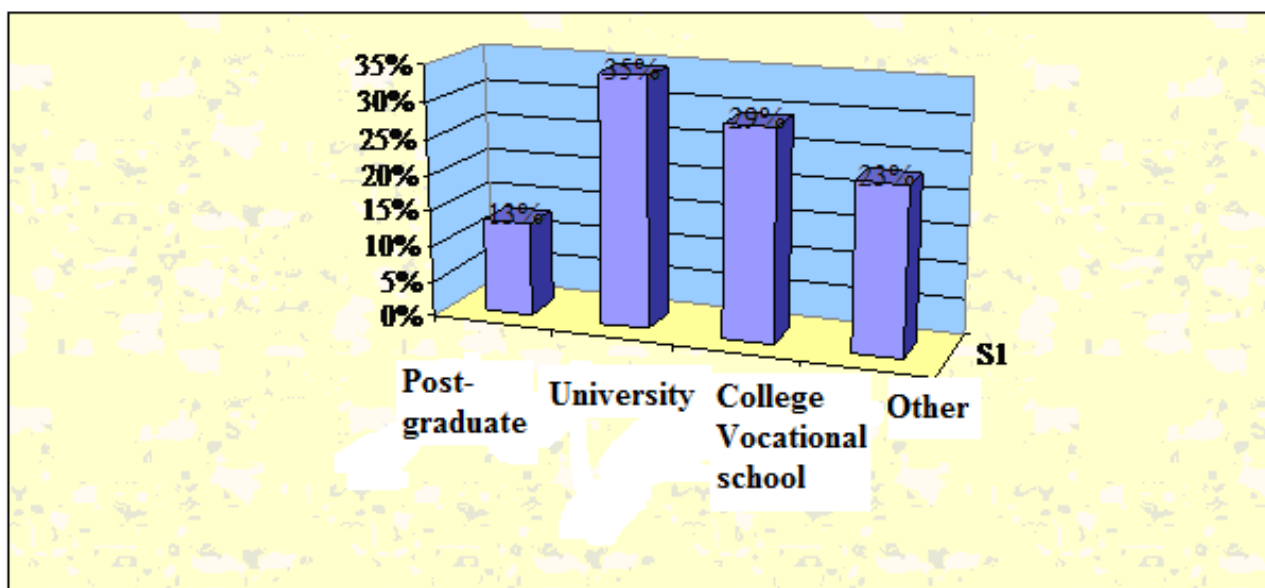**Figure 2.** Chart of results from analyzing genders

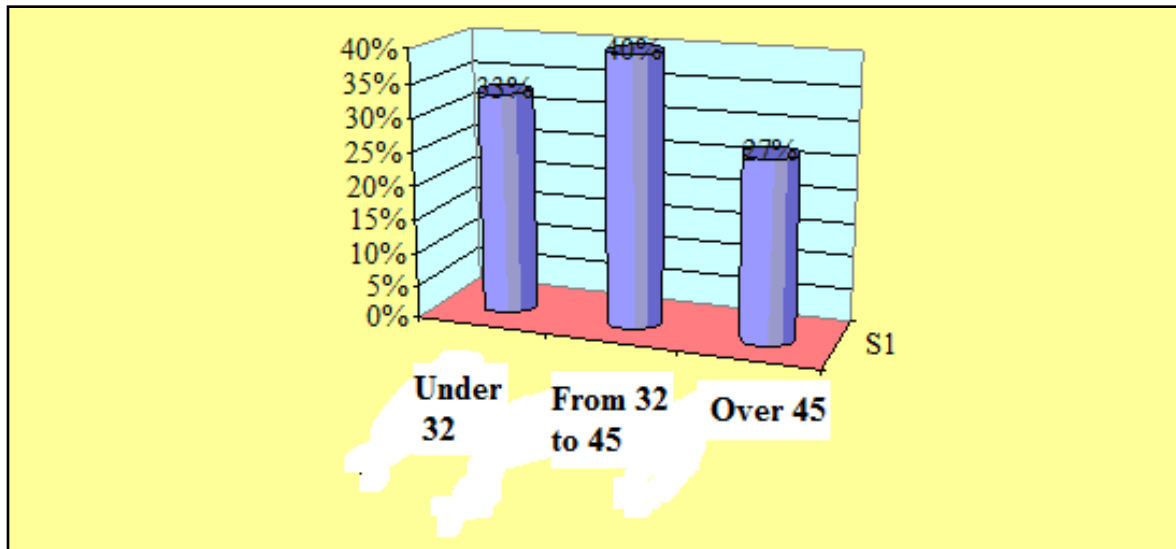**Figure 3.** Chart of results from analyzing qualification

Figure 4. Chart of results from analyzing age

- Among 130 collected survey cards, 33% of surveyed objects is under 32 years old, 40% of them is from 32 to 45 years old, 27% of them is over 45 years old.

Thus, we can see that surveyed objects at age are similar and university qualification reaches up to 35% which shows the abundance of surveyed objects; however, they are also guaranteed in some specific qualification to understand and comply with requirements on researching and evaluating factors affecting human resources properly.

4.2. Testing General Reliability Coefficient Cronbach Alpha

Through results from testing reliability, each group of questions has Cronbach's Alpha value greater than 0.6, so it can be acceptable.

Table 2. Synthesize results from evaluating reliability

Variable	Cronbach'Alpha
Recruitment and selection	.735
Training and development	.812
Wages, remuneration	.740
Knowledge	.825
Skills	.653
Qualification	.721

4.3. Assessing the Importance of Factors Affecting Training and Development of IT Human Resources in Thanh Hoa Province

4.3.1. Renovate and Improve Training Quality

From Figure 5, it can be seen the importance of renovation to improve training quality affecting training and development of IT human resources in Thanh Hoa province.

For criteria of renovating IT training at colleges and universities, 48% of surveyed objects thought it is very important.

For criteria of building and updating IT Training programs regularly, 37% of surveyed objects thought it is very important.

For criteria of implementing training based on advanced IT programs in the world 45% of surveyed objects thought it are important.

For criteria of building IT teaching programs based on knowledge modules 48% of surveyed objects thought it is quite important.

Thus, to train and develop IT human resources in Thanh Hoa province, improving IT human resources plays a very important role, in which Thanh Hoa province need pay attention to some issues such as: renovating IT training at colleges and universities; building and updating IT Training programs regularly; implementing training based on advanced IT programs in the world; building IT teaching programs based on knowledge modules.

Table 3. Results from analyzing the importance of renovating and improving training quality

Count

	Normal	Quite important	Important	Very important	Total
Renovate IT training at universities, colleges	13	13	41	63	130
Build and update IT Training programs regularly	15	41	26	48	130
Implement training based on advanced IT programs in the world	21	32	58	19	130
Build IT teaching programs based on knowledge modules	21	63	27	19	130

%

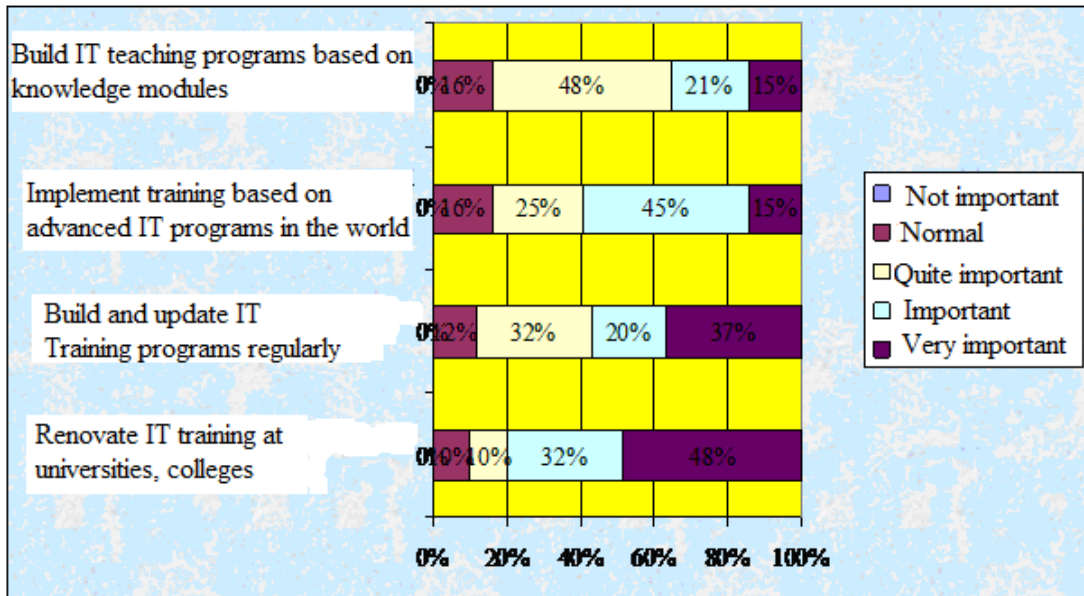|	Normal	Quite important	Important	Very important	Total
Renovate IT training at universities, colleges	10%	10%	32%	48%	100.0%
Build and update IT Training programs regularly	12%	32%	20%	37%	100.0%
Implement training based on advanced IT programs in the world	16%	25%	45%	15%	100.0%
Build IT teaching programs based on knowledge modules	16%	48%	21%	15%	100.0%

Figure 5. Chart of the importance of renovating and improving training quality

4.3.2. Expanding Training Scope and Form

Table 4. Results from analyzing the importance of expanding training scope and form

Count

	Normal	Quite important	Important	Very important	Total
Establish centers to train IT human resources	9	61	31	29	130
Expand IT training scope and form	16	31	56	27	130
Improve IT training quality	16	39	23	52	130
Foster distance education through internet to serve every kind of training form	14	37	47	32	130

%

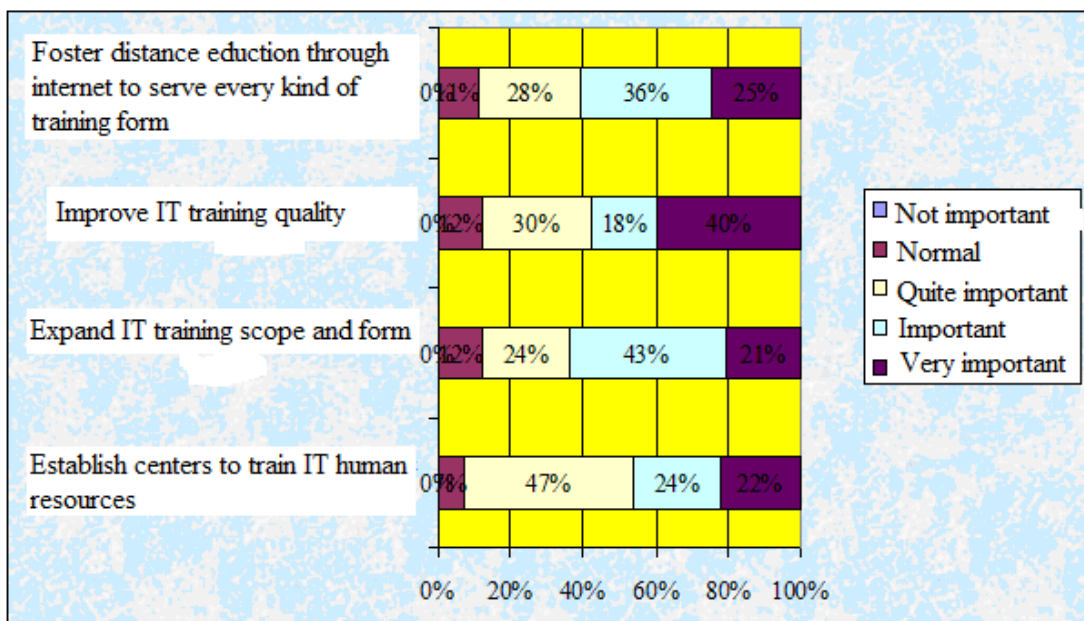|	Normal	Quite important	Important	Very important	Total
Establish centers to train IT human resources	7%	47%	24%	22%	100.0%
Expand IT training scope and form	12%	24%	43%	21%	100.0%
Improve IT training quality	12%	30%	18%	40%	100.0%
Foster distance education through internet to serve every kind of training form	11%	28%	36%	25%	100.0%

Figure 6. Chart of the importance of expanding training scope and form

Based on results from analyzing the importance of expanding training scope and form for IT human resources in Thanh Hoa province, the author saw that:

For criteria of establishing centers to train IT human resources, 47% of surveyed objects thought it is quite important.

For criteria of expanding IT training scope and form, 43% of surveyed objects thought it is quite important.

For criteria of improving IT training quality, 40% of surveyed objects thought it is very important.

For criteria of fostering distance education through internet to serve every kind of training form, 36% of surveyed objects thought it is important.

Through the analysis of the survey results, it can be seen that specific issues need to be addressed in expanding training scope and form for IT human resources in Thanh Hoa province. To expand training scope and form for IT human resources in Thanh Hoa province, it is necessary to implement some issues well: establishing centers to train IT human resources, expanding IT training scope and form,

improving IT training quality and fostering distance education through internet to serve every kind of training form.

4.3.3. Socialize Computing Universalization

From Figure 7, it can be seen the importance of socializing computing universalization affecting training and development of IT human resources in Thanh Hoa province.

For criteria of encouraging organizations and individuals to participate in training, 39% of surveyed objects thought it is very important.

For criteria of implementing training programs of IT applications for agencies and enterprises, 38% of surveyed objects thought it is important.

For criteria of building solutions to attract all social resources, 42% of surveyed objects thought it is quite important.

For criteria of attracting foreign scientists to cooperate and teach IT programs, 47% of surveyed objects thought it is quite important.

Table 5. Results from analyzing the importance of socializing computing universalization

Count

	Normal	Quite important	Important	Very important	Total
Encourage organizations and individuals to participate in training	17	30	32	51	130
Implement training programs of IT applications for agencies and enterprises	16	34	49	31	130
Build solutions to attract all social resources	28	55	21	26	130
Attract foreign scientists to cooperate and teach IT programs	28	61	21	20	130

%

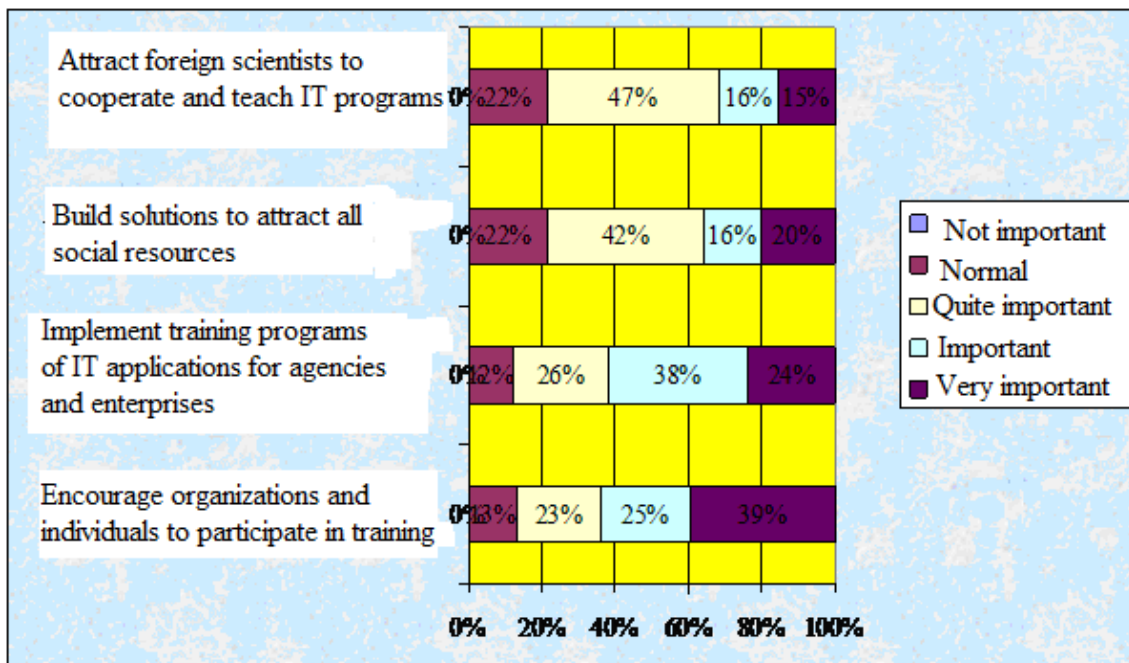|	Normal	Quite important	Important	Very important	Total
Encourage organizations and individuals to participate in training	13%	23%	25%	39%	100.0%
Implement training programs of IT applications for agencies and enterprises	12%	26%	38%	24%	100.0%
Build solutions to attract all social resources	22%	42%	16%	20%	100.0%
Attract foreign scientists to cooperate and teach IT programs	22%	47%	16%	15%	100.0%

Figure 7. Chart of the importance of socializing computing universalization

To train and develop IT human resources, Thanh Hoa province needs not only investment of the State but also socializes computing universalization, actively encourages organizations and individuals inside and outside the country so that all community pay attention to IT field, in which the province should focus on attracting foreign scientists to cooperate and teach IT programs, implement training programs of IT applications for agencies and enterprises and encourage organizations and individuals to participate in training …

4.3.4. Invest in Developing Human Resources

Based on results from analyzing the importance of investing in developing human resources in Thanh Hoa province, the author saw that:

For criteria that the State gives priority to invest budgets in training IT human resources, 52% of surveyed objects thought it is important.

For criteria of creating favorable conditions for investors inside and outside country to establish centers for training IT human resources, 47% of surveyed objects thought it is quite important.

For criteria of investing in facilities, programs and curriculum, 30% of surveyed objects thought it is very important.

For criteria of using ODA to invest in training human resources, 42% of surveyed objects thought it is quite important.

Based on analysis of survey results, we can see specific issues that need be addressed in the investment for IT human resource in Thanh Hoa province. Thanh Hoa province need concentrate on implementing below issues well: further use ODA to invest in training human resources, invest in facilities, programs and curriculum, set policies to create favorable conditions for investors inside and outside country to establish centers for training IT human resources and have projects to develop IT human resources to take advantage of investment capital from state budget for human resource training.

Table 6. Result from analyzing the important of investing in developing human resources

Count

	Normal	Quite important	Important	Very important	Total
The State gives priority to invest budgets in training IT human resources	15	17	67	31	130
Create favorable conditions for investors inside and outside country to establish centers for training IT human resources	17	61	23	29	130
Invest in facilities, programs and curriculum	26	31	34	39	130
Use ODA to invest in training human resources	23	54	34	19	130

%

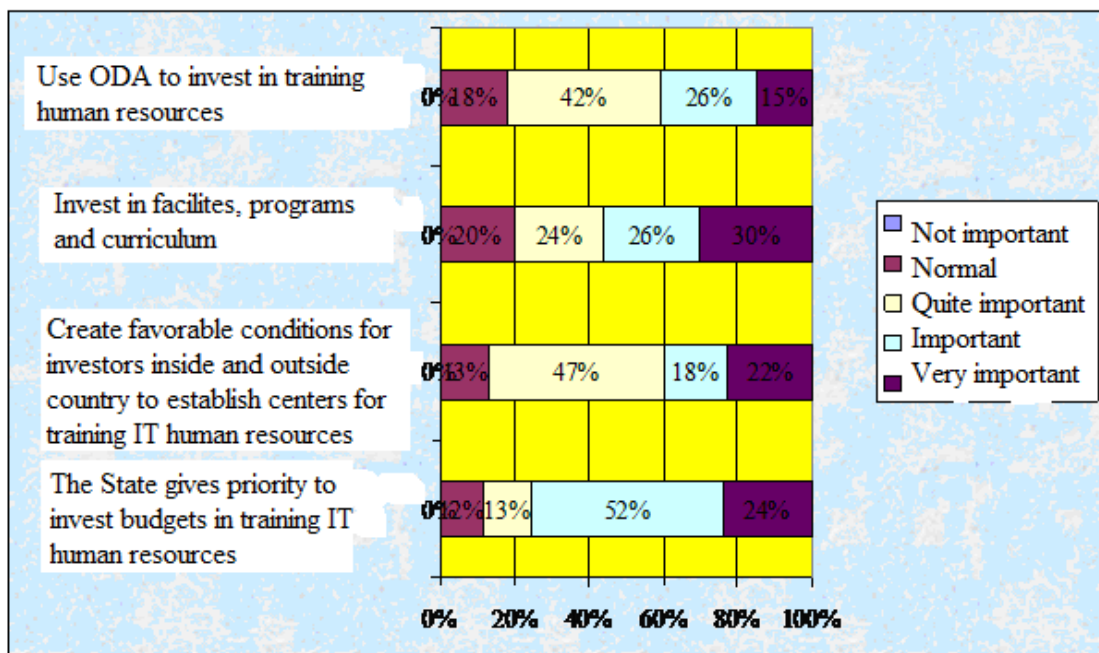|	Normal	Quite important	Important	Very important	Total
The State gives priority to invest budgets in training IT human resources	12%	13%	52%	24%	100.0%
Create favorable conditions for investors inside and outside country to establish centers for training IT human resources	13%	47%	18%	22%	100.0%
Invest in facilities, programs and curriculum	20%	24%	26%	30%	100.0%
Use ODA to invest in training human resources	18%	42%	26%	15%	100.0%

Figure 8. Chart of the importance of investing in developing human resources

5. Some Solutions to Improve IT Human Resources in Thanh Hoa Province

5.1. Innovate Programs, Contents, Methods, Training Process to Improve Quality of IT Human Resource Training

Innovate IT training well at universities, colleges under Resolution No. 14/2005/NQ-CP dated 02/11/2005 by the Government on innovate basically and complete Vietnam higher education in the period 2006 – 2020;

Develop and regularly updated IT training programs to ensure the smoothness of trained levels, increase practicality of the program and increase the percentage of practices in IT courses, eliminate backward programs and subjects, subjects which can not respond or match with actual requirements. Establish forums via email to consult feedback from alumni and units using IT laborers on training program contents. Encourage students to participate in IT training courses and certification exams of international organizations and multinational corporations in the IT and telecommunications sectors;

Universities and colleges select, accept selectively and implement to train under advance IT programs in the world practically;

Innovate programs, contents and methods to train IT teachers at Education universities; strengthen to teach IT application in teaching and learning, apply advanced educational technologies;

Build IT curriculum under knowledge modules, update new technologies and deploy training to meet the needs of learners. Apply these programs for educational levels and continuing education courses.

5.2. Expand IT Training Scope And Form

Create favorable conditions to establish appropriate centers for IT training to meet training needs of IT resources at all levels;

Expand IT training scope and form at IT training centers;

Expand training scope, at the same time, improve IT training quality of continuing education centers. Issue appropriate mechanisms and policies to promote the continuous training at all levels;

Promote training based on orders of enterpeises and the needs of society. Encourage and create favorable conditions for joint training between using places and IT human resource training centers. Develop models, coordinate, cooperate and support training to meet the needs of enterprises and society;

Continue second degree training in the field of information technology;

Enhance teaching and computer using skills as well as apply IT for students at all majors;

Promote distance learning network for all types of training. Specify operating conditions for on-line training, recognize validity of degrees, certificates of on-line training activities and test on-line training quality for all educational levels.

5.3. Further Socialize Computing Universalization for the Whole Society

Encourage organizations and individuals inside and outside the country to participate in training IT human resources in various forms. Attract and create favorable conditions so that universities can cooperate with scientists teach IT in Vietnam;

Agencies and enterpeises make plans, to train, foster and universalize IT knowledge regularly for officers, public servants and laborors, implement IT training programs for managers and leaders of agencies, enterpeises; training programs on building, implementing, managing and supervising IT application programs for officers expertising in imformation technology;

Build solutions to attract all social resources for serve IT training practical. Promote full and effective role in implementing, encouraging and supervising socio-political institutions, professional in all activities related to training human resource.

5.4. Enhancement of Investment in Developing Human Resource in Information Technology (IT)

The State places priority on budget for education and training of human resource in information technology (IT), electronics and telecommunications through programs and projects within this General plan and others plans and projects of education;

Spending annual State's budget on conducting scientific and technologial duties to do researches and deploy the IT applications;

Creating conditions for investors in the country and overseas to establish institutions of training human resource in IT in accordance with legal regulations and investing in the direction of IT services. Having policies for training places to enjoy favorable conditions in IT training activities equivalent to those for software production companies;

Enhancing the investment in material facilities, equipment, programs, textbooks, documents, educational materials and Internet which serve in the education of IT, electronics, telecommunication and IT applications in all educational institutions. Prioritizing investment in material facilities for some main training bases in fields of IT, electronics and telecommunications to reach the advanced level in the region and in the world;

Having policies on contributing to reasonable training expenditure of learners;

Prioritizing investment in training bases in remote, mountainous and island areas and areas with special difficulties;

Encouraging manufacturers to develop the program of providing computers and internet connection with favorable price for teachers, students and pupils; Striving to have 100% of lecturers at universities, colleges, 90% of teachers at high schools, professional intermediate schools and students with private computes; Doing researches and enforcing policies on supporting teachers and students in lending money to buy computers;

Using fund from ODA to invest in educating IT human resource, building educational network and high-quality IT training bases.

5.5. Improvement of Education Network (EduNet)

Implementing broadband Internet connection and private channels via fibre optic cables to all educational management entities and educational bases.

Building a data center of education network;

Building education portal with digital content and educational resources on the Internet. Building, selecting and buying digital library of books, textbooks, documents, school materials, lectures for teaching, studying and scientific reseach purposes;

Applying e-Learning educational technology in teaching and studying. Constructing content, programs, lessons and deploying courses in e-Learning model. Initially surveying and implementing M-Learning and U-Learning;

Enhancing annual training and education of IT applications for teachers, educational managers, students and pupils via the Internet in order to save time, expense and have high teaching effectiveness.

5.6. Enhancing the Teaching of Informatics and IT Applications in High Schools

Continuing to teach informatics and enhance IT skills for high school students at all levels;

Updating teaching programs and content in the direction of modern and practical knowledge module instead of using a set of fixed programs and informatics books;

Improving the application of IT in high schools to renew teaching and studying methods in the direction of self-integration of IT by teachers in every other subject rather than only in informatics subject. Teachers of each subject should actively prepare and choose documents and software (open source) by themselves to teach IT applications;

Improving the education and training to enhance the capability of informatics teaching staff to meet the requirements of teaching and applying IT in education, especially in high schools at first;

Building and promulgating standards of knowledge and skills of IT applications for teachers and educational managers.

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