

CHALLENGES POSED TO THE TRAINING OF INFORMATION TECHNOLOGY FIELD AT TAN TRAO UNIVERSITIE

*Ha Hoang Thi Ngoc**, *Binh Vu Thanh*

Tan Trao University, Vietnam

**Email address: ngocha89.cdsp@gmail.com*

DOI: 10.51453/2354-1431/2023/953

Article info

Received: 01/12/2022

Revised: 02/02/2023

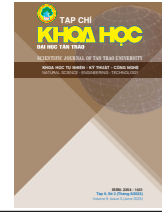
Accepted: 16/5/2023

Abstract:

The context of digital transformation is increasingly strong in Vietnam, creating opportunities for universities to train human resources in the field of Information Technology. However, it also poses many challenges to meet the new requirements of the labor market. This article addresses some of the issues related to Information Technology training at Tan Trao university and proposes some necessary solutions to improve the quality of training.

Keywords:

*digital transformation,
information technology
quality of IT workforce*



**NHỮNG VẤN ĐỀ ĐẶT RA ĐỐI VỚI CÔNG TÁC ĐÀO TẠO NGÀNH CÔNG NGHỆ
THÔNG TIN TẠI TRƯỜNG ĐẠI HỌC TÂN TRÀO
TRONG BỐI CẢNH CHUYỂN ĐỔI SỐ**

Hoàng Thị Ngọc Hà, Vũ Thanh Bình*

Đại học Tân Trào, Việt Nam

**Địa chỉ email: ngocha89.cdsp@gmail.com*

DOI: 10.51453/2354-1431/2023/953

Thông tin bài viết	Tóm tắt
<p>Ngày nhận bài: 01/12/2022</p> <p>Ngày sửa bài: 02/02/2023</p> <p>Ngày duyệt đăng: 16/5/2023</p>	<p>Bối cảnh chuyển đổi số đang diễn ra ngày càng mạnh mẽ tại Việt Nam vừa tạo ra cơ hội cho các cơ sở giáo dục đại học trong việc đào tạo nhân lực ngành Công nghệ thông tin (CNTT) nhưng cũng đặt ra không ít thách thức để đáp ứng với các yêu cầu mới của thị trường lao động. Bài báo nhằm đề cập đến một số vấn đề đặt ra đối với công tác đào tạo ngành CNTT tại Trường Đại học Tân Trào và đề xuất một số giải pháp cần thiết nhằm nâng cao chất lượng đào tạo đối với ngành CNTT.</p>
<p>Từ khóa:</p> <p><i>chuyển đổi số</i> <i>Công nghệ thông tin</i> <i>chất lượng đào tạo</i> <i>nguồn nhân lực.</i></p>	

1. Introduction

The National Digital Transformation Program until 2025, with a vision toward 2030, has been approved by the Prime Minister with the goal of making Vietnam a stable and prosperous digital nation, pioneering the testing of new technologies and models [3] This program has spurred the emergence of a series of IT companies. They and existing businesses and the demand for IT personnel in organizations and agencies, a recruitment frenzy for IT human resources has been created. Of note, the employment rate for IT graduates is very high. Up to 80% of surveyed IT students have a job immediately after graduation, and no students are unemployed after 6 months. Even a significant

proportion (about 36.67%) have a job before receiving their degree [5]

According to data from TopDev - a recruitment and employment platform specifically for the IT sector, the labor shortage in this industry is increasingly escalating. Specifically, in 2019, Vietnam lacked 90,000 personnel; in 2020, it lacked more than 400,000 personnel; in 2021, it lacked more than 500,000 personnel, and in the coming years, the personnel shortage is expected to increase even further due to the trend of digital transformation being implemented in all fields for survival and development. According to statistics from the National Committee on Digital Transformation, Vietnam currently has nearly 160 universities offering IT majors. Every year, the number of graduates from

these majors is around 50,000 or more. If including vocational training at the college and intermediate levels, this number increases to more than 62,000. However, this number is still not enough to meet the comprehensive national digital transformation plan in all fields.

The shortage of human resources in the field of IT has created an opportunity for higher education institutions, including Tan Trao University, in their enrollment efforts, but it also poses many challenges for universities in improving the quality of IT workforce training. Science and technology are changing every day, and the demands of the labor market are changing rapidly as well. This requires universities to fully evaluate the issues posed to their training efforts in this new context and provide appropriate solutions to train high-quality IT human resources.

2. The challenges posed to the training of Information Technology majors at universities.

Based on the analysis of documents, reports, relevant research results, and a survey of 120 subjects including IT lecturers, IT students, educational managers, etc., the research team has identified several issues that the IT education at Tan Trao University is currently facing, including:

First of all, the requirement for regular updates to the training program

Information Technology is a field with high recruitment demand, however, due to the rapid development pace of science and technology, universities must constantly update and adjust their training programs to meet the recruitment needs of businesses. Although in recent years, Tan Trao University has been promoting cooperation and incorporating the requirements of businesses for students, the training program still lacks direction, the curriculum and lectures are heavy on theory, and do not keep up with the development of advanced technology in the world. Therefore, there is a demand to update the training program so that graduates have a foundation of theoretical knowledge, practical skills, and application to meet the expectations of employers as well as the development of the 4.0 technology revolution. Currently, the common situation of the information technology workforce is that the rate of graduates in the field of information technology who meet the requirements for knowledge, skills, and professional

attitude demanded by employers is not high. Therefore, many businesses have to retrain or mentor new hires for a significant amount of time.[1]

Therefore, the issue facing Tan Trao University is the need to invest further in researching, developing, and continuously updating its training programs, and to provide training plans that are appropriate to the requirements of businesses.

Secondly, Digital transformation requires a digital learning environment.

The issue of establishing a digital learning environment to keep up with the development of technology has created numerous challenges for universities, including Tan Trao University. These challenges include setting up digital management systems, adjusting training programs by adding and replacing some courses with digital ones, and changing teaching methods to maximize the use of information technology

In addition, to establish a digital environment within the university, Tan Trao University has invested in upgrading teaching and learning equipment, laboratories, and the system of training management software.. However, this investment and upgrade still do not meet practical requirements, as computers in classrooms have not been upgraded and replaced due to budget shortages and difficulties in the autonomous university mechanism of a local university. Currently, Tan Trao University has a total of nearly 400 computers, of which 100 are installed in 3 computer rooms for IT teaching.



P1. Tan Trao University is installing an additional computer lab

Thirdly, Shortage of high-qualified lecturers to teach IT

Except for top universities in IT training, attracting highly qualified and experienced teachers in the IT

field is a challenge for most universities. Currently, the structure of the faculty teaching IT at Tan Trao University is as follows:

Qualification Level	Full-time Lecturers	Part-time Lecturers	Number of lacking Lecturers
Professor, Associate Professor	0	02	04
Doctor	01	05	02
Master	06	03	03

Faculty members meet the academic qualifications required for university lecturers, but most of them lack practical experience in the industry or are not up-to-date with the latest knowledge in IT around the world to apply to their teaching. In addition, most of them lack the motivation to conduct scientific research projects or lack connections with international research organizations in the field of IT.

According to statistics in 2022, the number of scientific products of the IT Science department's faculty is 15 articles, of which 9 articles are in the ISI/Scopus list, 2 projects, 1 published material. The surplus of scientific research hours is over 3000 hours. However, among these scientific products, 12 were produced by one lecturer, while the remaining lecturers each only carried out 1 product, meeting the research hours quota or having very little surplus.

The fourth is the demand for close collaboration between the university and businesses

42.5% of opinions surveyed from lecturers and students believe that the cooperation between the university and enterprises in the field of IT is not yet tight. In reality, in recent years, the University has been promoting cooperation activities with enterprises, but the connection between the University and enterprises in the training of the IT industry is still limited to activities such as building and adjusting training programs, creating practical environments for students, etc. Research and technology transfer activities in this field are still modest.

Furthermore, Tan Trao University has not emphasized enough on the cooperation of using facilities, equipment, and software of businesses in training and practical activities. The reason is the lack

of regulations, favorable conditions, and environment for expanding autonomy in research application, coordinating training, and commercializing research results. This creates many difficulties in ensuring the university's training program to change in a timely manner to meet the requirements of businesses.

3. Solution to enhance the quality of IT training in the current digital transformation context

Firstly, regularly updating the training program and innovating teaching methods

Tan Trao University needs to regularly update its training program to keep up with the latest changes and trends in the IT field. Strengthening connections in IT training between universities and building a reasonable training program direction to establish a shared data repository is necessary. The training program should focus on practical and applied skills to help students apply their knowledge in practice. According to the Ministry of Education and Training, the quality of human resources, especially high-quality human resources, has not yet met the requirements for the country's development. The root cause is the low quality of training, the lack of career and international orientation, insufficient work skills of graduates, and weak links between businesses and training institutions.. To solve these problems, developing an applied IT human resources training program is one of the necessary solutions [4]

For skills and knowledge, according to Professor Gottfried Vossen (University of Münster, Germany), besides equipping core skills and knowledge of digital technology such as Big Data, IoT, Cybersecurity, Cloud Computing, Ethical Hacking, and Mobile Programming, embedded programming according to international technology standards, IT workforce needs to be trained and educated in interdisciplinary and non-traditional knowledge and skills, where IT must be closely associated with Digital Economy, Digital Society, Healthcare, Agriculture, Industrial Production, etc. Strengthening skills training, especially in foreign languages, is a crucial factor as it is currently the biggest barrier for IT personnel to access new knowledge from around the world and the region. Additionally, it is necessary to enhance the innovation of teaching methods, in which the application of IT in teaching activities should be emphasized to maintain the continuity and adaptability of training activities in

the context of digital transformation. Syllabi, materials, and lectures of courses must be prepared with content that can be taught on both online and offline platforms. Prioritizing the development of online courses and making it a popular and effective training tool should also be a focus.

Secondly, building and developing a digital university model

To solve the issue of IT human resources, many countries, notably South Korea and India, have identified the development of digital universities as an important breakthrough solution to develop, ensure the quantity and quality of human resources in general and digital human resources in particular. Digital universities, simply understood as the digital transformation of university education, bring the entire activities of the university, including faculty and students, into the digital environment. Therefore, it is necessary to determine the construction of schools according to the intelligent university model based on a comprehensive digital transformation platform, which is a strategic and long-term issue for universities in the coming time. Therefore, Tan Trao University needs to prioritize the modernization of its infrastructure and technology to ensure the training in the field of IT keeps up with the advancements of science and technology in the Industry 4.0 revolution. It is necessary to supplement and improve equipment and laboratories to ensure that students have enough conditions to learn and practice practical skills. Prioritizing budget allocation to implement programs, projects to improve the quality of IT human resources, digital transformation projects, and the application of IT to administrative and state management

Thirdly, improving the quality of IT lecturers is necessary

In the 4.0 technology revolution, educators are not just knowledge transmitters, but they must be professional educators with creative minds, critical thinking skills, independent thinking, positive collaboration skills, and effective support for students to learn what they want to know, and provide new ways of understanding for learners. The fusion of scientific intelligence and teaching skills is the foundation for educators to remain steadfast in the face of the dizzying development of artificial intelligence. In the context of rapid development of Information and Communication

Technology (ICT), many teachers no longer have sufficient knowledge to teach new technologies. Attracting and recruiting highly qualified lecturers is a significant concern for Tan Trao University at present.

To improve the quality of the lectures, it is necessary to promote training, professional development, and skill development for teachers to ensure timely adaptation to changes in science and technology. In addition to ensuring the training standards of the teaching staff, special attention should be given to enhancing CDIO (conceive, design, implement, and operate) and pedagogical skills of teachers. Along with innovating teaching methods, teachers must focus on leveraging the role of ICT in teaching activities for students in this field, requiring teachers to find suitable solutions to improve teaching quality and meet the practical demands of education innovation and the ever-changing technology.

Additionally, to strengthen both the quantity and quality of the faculty, Tan Trao University needs to consult with the provincial people's committee to develop policies that attract Vietnamese scientists abroad and international IT experts to participate in training and scientific research. It should also encourage experienced technical and managerial staff from businesses to participate in IT workforce training at the University. A mechanism to encourage faculty members to become IT research students should be established, and maximum conditions should be created for those with a PhD to complete the requirements for promotion to Associate Professor. At the same time, incentives should be created for faculty to conduct scientific research and implement research projects, with a requirement that scientific products must be closely related to their field of expertise.

Fourthly, enhancing the linkage between enterprises and universities in training IT human resources

The Law on Higher Education has identified that university education is for research and practical training, and society has an increasing demand for a highly skilled workforce. Therefore, the training of IT human resources must focus strongly on the labor market, and learners must be provided with a favorable environment to practice their profession throughout the training process at the university.

With more than 60% of the respondents choosing to enhance the collaboration between the university

and businesses as an important solution to improve the quality of IT training at Tan Trao University, in the coming time, Tan Trao University needs to strengthen the cooperation between the training institution and employers in developing IT human resources. Specifically, promoting technology transfer between businesses and the university to enable students to have more opportunities for practical training and internships at companies, together building and organizing specialized training and continuous training. Collaborating with businesses to carry out research topics, applied research and plans to deploy digital universities; organizing competitions in artificial intelligence, data exploitation and processing solutions, and student startup projects.

In addition, it is necessary to strengthen cooperation to develop the training program, including defining the output standards. It is important to distinguish between the concepts of output standards and program objectives, so that the output standards are not only general requirements, but specific requirements closely related to the needs of employers. Businesses can also propose additional elective courses for students according to their needs. The ultimate goal is for graduates to have both specialized knowledge and proficiency in English, as well as a professional work ethic and attitude.

Additionally, Tan Trao University needs to enhance collaboration to utilize the facilities, equipment, and software of businesses for students' practical training and application skills, thereby reducing the difficulties in investing funds to build modern facilities and equipment.

4. Conclusion

Based on the analysis of the above content, it can be seen that in the context of the continuous development of science and technology, digital transformation has become one of the top priorities nowadays. Therefore, the training of IT industry at universities, including at Tan Trao University, must face many challenges. This requires proactive measures to be taken by the university to ensure that the IT industry continues to develop, become a spearhead industry, and meet the needs of the labor market.

REFERENCE

- [1] Developing the human resources of the Information Technology industry in the period of 2021-2025: current situation and solutions, <https://khoinganhcntt.com/nganh-cong-nghe-thong-tin-hien-nay-1660792675>.
- [2] Ministry of Information and Communications (2021), Project “*Enhancing awareness, training and developing digital transformation human resources until 2025, with orientation to 2030*”.
- [3] Hieu Nguyen (2021), Which field of study is attractive in the context of digital transformation?, <https://giaoducthoidai.vn/nganh-hoc-nao-hap-dan-trong-boi-canh-chuyen-doi-so-post583493.html>.
- [4] Pham Thi Thu Thuy (2018), *Training IT human resources towards application orientation, comments and proposals*, Proceedings of the School-level Scientific and Technological Conference, Developing the human resources of the Information Technology industry in the era of Industry 4.0, Nha Trang University.
- [5] Tran Quoc Toan (2021), *Developing the human resources of the Information Technology industry in the period of 2021-2025: current situation and solutions*, Journal of Industry and Trade - Scientific research results and application of technology, No. 20, August 2021.