The use of digital pedagogic in forest related higher education in Vietnam

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Abstract. The article is devoted to the study of the application in practice of the digital pedagogic in the forest higher education in Vietnam. In the article, the problems of higher forest education development in Vietnam are considered. The problems associated with the organization of an effective training process for the forest sector specialists have been highlighted. The urgency of raising the qualification and competence of specialists of the forest industry by using innovative teaching methods in training is justified. Possibilities of the use of distance education technologies for the training of students and the improvement of professional skills of workers of the enterprises of the forest sector are considered.

1. Introduction

Information technology and digital gadgets inevitably came into our lives and became an indispensable helper in all areas from work to entertainment. The same applies to training in the companies, at universities and schools. Using a computer makes learning much easier, giving access to unlimited sources of information in the form of a worldwide network.

Effective education that meets business needs is one of the most important tools for building the digital economy and developing small and medium enterprises. The key feature of the digital industry is its high dynamism. New technologies, products, programs are constantly being created and introduced, and the amount of incoming information is increasing. Training becomes uninterrupted, throughout the entire working life.

The training of specialists for business becomes more and more dependent on the development of the need of the industry. In Vietnam nowadays the forest sector enterprises are developing and there is a high necessity of training specialists for that sector.

The Vietnamese wood products are represented in more than 120 countries and territories with beautiful designs, a variety of species to suit the tastes of different types of consumers. Currently, Vietnamese export of wood products and forest products account for about 6% of the world market. In addition to traditional markets, the consumption of wood products and forest products had increased in new markets such as Canada, China, Japan, the U.S., and South Asia [1]. The opportunities are opening for wood products and forest products to be exported to the new markets. But the
competitiveness in the markets of forest products is very high. To be more effective any forest related enterprise needs to find out how the costs for the production may be lowered. One of the most important cost items of any forest enterprise is personnel costs. Their optimization will significantly reduce production costs and thus increase the profitability of production. Another opportunity to raise the effectiveness of production is to use more effectively the personnel. One of the opportunities to increase the efficiency of personnel use is their training using modern and innovative methods. It is also very important to train qualified personnel to work in the forestry sector in Vietnam and to organize continuous training for them.

Currently, there is a serious shortage of highly qualified Vietnamese personnel in the forestry sector, which is not sufficient to meet the market demand. There are more than 4 500 enterprises in Vietnam's timber industry, of which 1 863 are direct export enterprises, 700 enterprises with foreign investment (FDI) and 340 timber processing villages, as well as more than 420 000 permanent workers in the timber industry and millions of indirect workers [1]. Only 2% of all workers have higher education; 30% have secondary special education, the rest have no special education and are engaged in unskilled labor. The share of them is about 70-80%. Low skill level results in low productivity in the Vietnamese timber industry, which accounts for only about 50% of the productivity in the Philippines, 40% in China and 20% in the European Union [2]. Taking into account the current availability of workers in the forest sector, the issue of training and professional development of workers in the forest sector is very important.

In the next 10 years, the woodworking industry in Vietnam will strive to reach 20 billion dollars of income, which requires an increase in the quantity and quality of human resources. It is projected that by 2025 the demand for labor in the forest sector will be 106 800 people with higher education and 445 200 workers. On the other hand, high digital technologies are forcing production lines to automate, control numerically and, of course, require workers to have special higher education and full technology facilities and equipment. Enterprises with untrained workers without professional certificates will be at risk when Vietnam joins the CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership) free trade agreement. Vietnam has already participated in the TPP (Trans-Pacific Partnership Agreement), so there is a need to orient training according to the needs of enterprises. In addition to long-term training, it is also necessary to train short-term programs by developing training models for cooperation between universities (school) - enterprises, universities (school) - enterprises - the State, where the role of the State is to support industries; the role of enterprises is to participate in the training process [2].

Therefore, it is very important to train qualified specialists whose competences will meet the requirements of the forest sector enterprises, and the use of digital pedagogy methods will ensure a high level of quality education.

2. Methods and Materials
The main method used in this research is data collection and analysis. The statistical method, comparative method to analyze information, expert sampling method, analyzing secondary data and collecting primary data methods were used. Statistical tools in economics such as descriptive statistics, analytical statistics, etc. are used to calculate and verify the statistical indicators of collected data.

In the research, there were used relevant published papers of scientific researches, legal documents and open sources on the development of the Forestry in general and the wood processing industry in particular, such as the forestry development reports of Vietnam provided by the Ministry of Finance, the Ministry of Agriculture and Rural Development, the Department of Industry and Trade, the World Bank (WB), the Statistics Office of Vietnam, General Department of Vietnam Customs, United Nations Food and Agriculture Organization (FAO), Forest Trends, ASEAN Forestry Association.

The results gained in the research are also based on the interviews of the experts, managers, teachers, and students participating in the teaching and learning process as a basis for proposing orientations and solutions for improving the efficiency of using the digital pedagogy in training highly qualified specialists for the forestry sector in Vietnam.
3. Results and Discussion

Vietnam has four forest higher education universities: the Vietnam University of Forestry, Thu Duc University of Agriculture and Forestry, Hue University of Agriculture and Forestry and Ho Chi Minh City University of Technical Education. More than 300 students are enrolled in these universities every year. In the system of forest education in Vietnam there are also seven vocational schools enrolling more than 1000 students per year. Some agencies train highly qualified personnel for the forest sector, such as the Vietnamese Forestry Institute, the Vietnamese Forest Science Institute and the Vietnamese Forestry Administration. These organizations provide training to the forest sector specialists.

The entire higher education system in Vietnam and forest higher education is characterized by outdated curricula, the lecturer's focused teaching and learning, the lack of links between teaching and research, and the great disparity between theory and practice, resulting in a large number of graduates being unable to find jobs [3].

Methods of teaching delivered are mostly teacher-centered. Classroom discussion is rare, and students must be diligent and passive in the classroom. This method is an expression of Confucian culture, and in sharp contrast to American and English pedagogy, where interaction and discussion are more visible [4]. Thus, training methods that are used in forest higher education in Vietnam can be characterized as traditional, when the contact lessons are organized during the educational process. But the use of digital pedagogy in forest higher education in Vietnam has already become a necessary component of learning that complements traditional forms of learning. This is manifested mainly in the use of electronic means of communication for the instant transmission of information from the teacher to the learners and vice versa. This form of learning allows eliminate direct contact between the teacher and the student, the employee, throughout the learning process. It becomes more and more new form of learning that has its learning tools and technologies. Digital technologies, including augmented, virtual and mixed reality tools, which provide the effect of presence and easy access to the necessary information on a 24/7 basis in universities, schools, industrial enterprises and woodworking industry, in particular, help to increase the efficiency and speed of specialists training in Vietnam.

The use of digital methods in forest higher education in Vietnam changes the learning environment and tools of communication. The role of the Internet as an educational platform is increasing significantly by the opinion of teachers and students of Vietnamese forestry higher educational institutions. It is a huge learning environment, a source of a huge number of educational resources (digital libraries, interactive e-textbook tests, teacher websites, etc.). As tools for communication between the teacher and the student, the employee in Vietnam can be used: e-mail; social networks; personal website of the teacher; editors of electronic courses; webinars; various messengers with the function of video conference, etc [5].

The analysis of digital pedagogic in Vietnamese forest higher educational institutions showed that information and education environment in digital education includes:

1. Technical resources such as computers, tablets, mobile devices, networks, video systems, interactive screens;
2. Educational resources such as software, e-educational resources, information, and educational portals, distance learning systems, digital libraries, clouds resources, webinars, teleconferences;
3. Process management: distance learning, email, social networking, cloud-based personal account, the form of training.

The interviews that were made with the students of forest related Vietnamese higher educational institutions showed that they are very interested in learning with using digital approaches. They answered that it will be more convenient for them to study in a new format using a computer a lot because they can learn at any time, regardless of the schedule, which implies attending lectures at a certain time and place. Students also pointed out that there were no difficulties in learning how to use digital pedagogy, as for them the use of a computer had become an integral part of their lives. The students stressed that except using methods of distance learning they would like to have face-to-face lessons with teachers and other students, because studying only in a distance form will minimize the
opportunity to receive communicational competencies and experiences in work in a team, that are very important for today business.

Also, students mentioned that using methods of digital pedagogic will allow making an individual educational route. Students mentioned, that the use of distance learning opens up new opportunities for continuous learning and new knowledge, making learning more accessible because learning from distance today is prestigious, convenient, profitable, promising. Moreover e-learning opens the doors for students to study at institutions of higher education that they could not even dream of before.

Students noted that they did not need any superpowers or computer skills at a professional level to learn using distance learning. If a person can log on to the Internet, check emails, chat on Skype, and print a few sentences, he or she is well prepared for e-learning.

Distance learning was described by Vietnamese students by three main characteristics.

1) Convenient: does not require a university visit.

2) Flexible: focused on the student and allows him to set his rhythm, speed and even the content of his studies.

3) Effective: if a student determined to learn for himself, it will be much better than if he or she will be in the classroom under duress. In distance learning, the student appears in the system of distance learning to learn, not to spend time there.

Teachers interviewed in Vietnamese forest higher educational institutions concluded that using of digital technologies in forest higher education in Vietnam make it possible to orient the educational process not just to meet the requirements of the professional and educational standard, but to form the professional culture of the future specialist, striving for constant self-improvement through information services and technologies. Teachers mentioned that the process of organizing using digital pedagogic methods needs a lot of effort form their side. For example, online consultations are time-consuming and require a high level of consultation. They would like to have special training for organizing and implementing distance learning.

The teachers as an advantage of the distance learning mentioned that for some people, it is becoming not only the preferred but sometimes the only way to get an education. E-learning has become an excellent opportunity for people from far off parts of the country, from small villages with no universities; for people with disabilities who find it difficult or impossible to attend university.

Methods of digital pedagogic, by opinion of Vietnamese teachers from forestry educational institutions, can be used as a tool for creating a variety of dialogue trainings, testing, electronic courses, providing animation, video, narration, graphics and text files. To create an e-learning course it is necessary to know PowerPoint, based on which simple presentations are created. Students will be able to take courses not only from computers, but also from mobile gadgets.

Interviewed teachers mentioned the main advantage of distance learning is that the information on passing the stage of education is collected automatically through web-interfaces. A rating is created, which is continuously monitored during the implementation of the new training model stages. The monitoring includes such techniques as: collecting feedback from system participants; analysis of achievements at individual stages, comparison of training results in different units, as well as participants in face-to-face and distance learning; a periodic slice of knowledge gained; analysis of improvements in the performance, working and commercial success of employees, an increase in the number of completed transactions, implemented projects.

Company experts interviewed mentioned that distance learning is a powerful tool for company development, personnel training and improvement of the professional status of the company. The maximum effect of its implementation can be traced to achieving certain goals, such as increasing sales, optimizing the efficiency of business processes, improving interaction with partners, ensuring security, etc. Most of the specialists (about 80%) said that they would like to study using distance learning methods. The process of introducing a distance learning model requires continuous monitoring. If there is no proper control, the effect will be reduced and the costs will not be justified. In each company, the introduction of distance and e-learning is carried out on an individual scheme that is associated with the goals and objectives, structure and profile of the enterprise [6].
The experts from the Vietnamese forest companies characterized the system of distance learning as a system that consists of:

1) Base for storing e-learning courses, training content on video. Employees visit and re-examine the knowledge they would like to know better.

2) Work with individual employees who are taking individual courses. This also applies to a separate division and branch.

3) Detailed statistics for training quality control, analysis of material assimilation, test results, assessment of employees' progress.

4) A system of chat or forum communication, exchange of ideas, suggestions for adding topics and discussions.

Experts from forest companies in Vietnam mentioned that they will be ready to cooperate with forest related higher educational institutions in the frame of organization of distance learning for the specialists. But in the organization of the learning process they will take into account the facts that should be connected with using of distance learning:

1) reduction of expenses for traditional training for companions;
2) increase of efficiency of the enterprise activity (increase in sales, increase in profit);
3) optimization of efficiency of business processes of the enterprise (time-saving on the organization of the courses raising qualification, the competent organization of working process);
4) improvement of professional competence of employees and students, deepening of knowledge in the field of enterprise activity.

The process of implementation of distance learning in the company should be continuously monitored at each stage. In case of deviation of any stage from the specified parameters of efficiency the whole process may begin to take place in a distorted form and the final results will not bring the desired effect. In this case, the time and money spent on the implementation of the new training format will not be justified.

Monitoring allows to estimate the level of readiness of the enterprise and students for the introduction of the system of remote training, and also to trace dynamics of change by periods. For this purpose, a single evaluation system with criteria for comparing indicators for different structural subdivisions of the enterprise, different training systems and levels is created. Benchmarks are formed with the selection of the area of maximum achievements, the quality of management and strategies, information-technical and educational and methodological support is investigated.

The organized investigation about using the digital forest pedagogic methods in Vietnamese forest high educational institutions allows concluding that using of such methods is developing a lot during the last years and all the participants of the educational process found these methods very useful and important for the development of forest education in higher educational institutions in Vietnam.

4. Conclusion
The analysis showed that the need for innovative approaches to forest education was fully realized. The objective reasons for stimulating this process in forest education were identified. Among them there are the following common for the education system in Vietnam: determination of the priority direction as the training of personnel for innovative Vietnam; requirements to the quality of specialists training; development of engineering. More frequent reasons, however, are consonant with the problems of any sector of the economy in the current period of development are the tasks facing the forest sector of Vietnamese economy: introduction of innovative production technologies; renewal of the sector's material and technical resources; rejuvenation of human resources, etc.

Methods of digital pedagogy are a dynamically developing form in Vietnamese forest higher education which has its advantages and disadvantages. But in the conditions of rapid development of information technology the disadvantages of this method of education will be insignificant and may in the future replace the traditional method of education.

Proceeding from the fact that nowadays provide information technologies, the most perspective for realization in the educational process in Vietnamese forest higher education are the possibilities of
work with Big Data; deep immersion in a professional environment (Deep Learning); cloud and blockchain technologies (Cloud). The opportunity to work with Big Data allows using the potential of artificial intelligence to support the educational, scientific and creative activities of students.

Thus, the use of digital pedagogy methods in forestry higher education in Vietnam is the training of modern management techniques and the use of technology 4.0 for engineers and workers among enterprises and students at the university. When choosing training tools, employers should consider the preferences and strengths of the new generation that has grown up in the digital age. High involvement of the staff in the training process and the immersion effect allow achieving the best results. Thanks to the ability of modern technologies to preserve the knowledge of experienced employees, it is possible to transform the competences and skills of individuals into the intellectual capital of a company. Methods of digital pedagogy will be a key factor for the development of the forest sector, which will lead to an increase in the efficiency of business processes, increased productivity, quality of work, etc., as well as an increase in the number of employees [7].

Summing up, digital pedagogy is a new method of economic relations in all sectors of the world market, which is now developing rapidly and in the near future, with the growth of high technologies at the global level. Therefore, it is now necessary to join the General information and technological flow of updates and try to apply them effectively. It seems that the methods of digital pedagogy should occupy a certain niche in the educational process, but not replace traditional forms of education. Only a reasonable combination of digital and traditional pedagogy will provide an answer to the challenges of the time in the educational sphere [8].

Based on the above, it should be noted that the introduction of digital technologies is very important for the development of higher and vocational education systems, but at the same time it is necessary to form a scientifically sound approach to their implementation. Improvement of training, based on the cultural approach, will make it possible to form a digital dictionary, introduce block technology, which should become the basis for the development strategy of modern educational organizations [9].

After 2020, there will be a sharp increase in the application of distance learning technologies, which will make it possible to learning to be more individual and the student, will no longer depend on the location of its campus and fixed study schedule. At the same time, there will be a change in approaches to assessing the effectiveness of higher education formations [10].

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