BUILDING THE CAPACITY TO APPLY INFORMATION TECHNOLOGY IN TEACHING HISTORY AND GEOGRAPHY FOR STUDENTS OF THE DEPARTMENT OF PRIMARY EDUCATION - THE CASE OF TAY NGUYEN UNIVERSITY, VIETNAM

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Abstract
The competence to apply information technology in teaching History and Geography as well as in educating pedagogical students is one of the most important professional capacities of primary teachers to meet the new demands of the fourth industrial revolution and the recent innovation of Vietnamese education. Therefore, equipping student teachers of the Department of Primary Education with information technology competence (hereafter IT) is essential considering the Vietnamese education situation. This paper focuses on some issues regarding student teachers’ ability to utilize IT, the necessity to form this capacity for student teachers of Departments of Primary Education majoring in History and Geography subject (a case study of Tay Nguyen University), and recommendations to improve their capacities.

Keywords: Tay Nguyen University, primary education, competence, information technology, History and Geography.

1. Introduction
Applying information technology in teaching and learning is a popular trend of global education in the twenty-first century. Although many scholars argued the role and effects of using information technology in education, especially in teaching History and Geography, difficulties have been existed in applying IT actual classrooms [1, 2]. By surveying participants from twenty-six countries, Andrew Jones divided those disadvantages into two main categories. The first one concerns teachers’ issues such as their lack of confidence and technical ability. The second category is about management such as the duration of training undergraduates, the lack of student teachers’ pedagogical skills in teacher education program or the lack of
focus on information and communication technologies (ICT) in initial teacher education [3]. Besides, other scholars argued that other barriers in applying information technology existed during educating student teachers. Those barriers relate to knowledge, self-efficacy, pedagogical beliefs, and school culture and different subjects [4]. One of the most fundamental reasons is the training process of student teachers at universities or colleges. It might be that student teachers receive unsatisfactory training program or are trained only about technical skills and have no ability to apply their knowledge into the real teaching situation [5, 6].

In order to enhance the effectiveness of using information technology in teaching, the basic requirement is to form and improve student teachers’ competence to using IT in teaching different subjects [13] presented the model TPACK (Technological Pedagogical Content Knowledge) to specify capacities of applying information technology for student teachers. Accordingly, the training program ensures that undergraduates learn technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). All three types of knowledge are integrated [7]. By investigating factors affecting the IT competence of student teachers, Jo Tondeur concluded twelve themes with seven ones explicitly related to teachers’ preparation and the rest concerning differences among teacher education programs [8].

Information technology is important for the development of a knowledge economy. However, an application of IT in teaching and learning in Vietnam is quite limited. One of the foundational reasons belongs to the training program [10]. Most studies pay attention to study single skill of using IT in teaching for both pedagogical undergraduates in general and those ones of specific subjects [11], [12], [13]. Primary teachers receive guiding materials and in-service training courses annually regarding applying IT in teaching. However, software, tools and technical skills in these guiding materials are out of date and not align with new requirements of Vietnamese modern education. Recently, Tran Thi Ha Giang studied technical skills such as using office software, multimedia software and web browser among student teachers [14]. This research proposed a model of blended learning in teaching Geography. In this model, both traditional teaching approach and modern methods are integrated and IT contributed to teaching progress [15].

In Tay Nguyen University, there are many research projects to improve the quality of student teachers in the Department of Primary Education [16, 17]. However, there has been no research on forming the ability to apply IT among students of Department of Primary Education, especially those majoring in History and Geography and social sciences.

Hence, this research fills this knowledge gap on student teachers’ capacity for utilizing IT, thus leading to the improvement of student teachers’ quality in Tay Nguyen University.

2. Methods

The research aims to answer following questions:

1. What are student teachers’ competences in using information technology? Why is it necessary to form information technology application competence for primary student teachers majoring in the History and Geography subject at Tay Nguyen University?
What are suggestions to form student teachers’ competences to IC application?

The methodology is document analysis with reviewing, analyzing and synthesizing documents relating to applying IT in teaching and developing student teachers’ competence for applying information technology. The researchers also reviewed the requirements for innovation within Vietnamese tertiary education in the Industry 4.0 era, the current situation of teaching History and Geography at Vietnamese primary schools and evaluates the degree to which the curriculum used in Tay Nguyen University.

3. Results and discussion

3.1. Concepts of capacity and of ability to utilize information technology

There are many opinions about competence. Some scholars view competence as a combination of theoretical and practical knowledge, skills, behaviors in order to adapt to a real environment. In Vietnamese dictionary, competence has a similar meaning with capacity and ability. As such, competence is an ability and internal and natural conditions to do any job. It is also psychological and physiological quality creating skills to help people to complete activities with high quality [18]. Vietnamese general educational curriculum states that competence is a personal attribute forming and developing due to the combination of both people’s internal qualities and the learning and experimenting progress.

It allows people to capitalize knowledge, skill, and other personal attributes such as beliefs, in order to perform any activity with desired results in specific conditions [19].

In Vietnam, the concept of information technology is a collection of modern scientific methodology, technology, technical tools to produce, transfer, collect, analyze, keep and exchange digital information. As this concept, information technology includes two factors: information technology and media. However, we only focus on the first factor – information technology in this paper.

With the above opinions about competence and IT, it is possible to recognize that the ability to apply information technology of Vietnamese student teachers requires a combination of many factors. They must not only understand knowledge about tools, technology resources but also apply and adapt effectively that knowledge to the real educational environment to communicate, create, expand, manage digital information in their teaching at schools. Their activities must be associated with their belief and behavior. They also have to teach with fundamental knowledge and skills rather than an arbitrary adaptation.

3.2. Necessities of forming the ability to apply IT for primary student teachers majoring in History and Geography, Tay Nguyen University

3.2.1. Requirements of the fourth industrial revolution

The fourth industrial revolution has created big changes which largely affect economy, society, education, especially higher education. This revolution requires that all Vietnamese universities and Tay Nguyen University in particular need to train new generation of labor who have knowledge of information technology, can update and apply the latest information and knowledge into the society, professional jobs in different subjects. Under the designation
of Vietnamese Prime Minister, no. 16/CT-TTg, all universities in Vietnam need to provide labors with abilities to adapt to the fourth industrial revolution. The Resolution of the 11th National Party Congress pointed out: “Fundamentally and comprehensively innovating Vietnamese education towards standardization, modernization, socialization, democratization and internationalization, in which the renovation of educational management mechanism, development of teachers and management staff is a key factor” [20].

3.2.2. Status of teaching History and Geography in Vietnamese schools

Recently, teaching and learning History and Geography in schools have been taken the gravity of educational dicussion in Vietnam. It is because students’ score of the History subject in the national examination was lower than that of other subjects such as Literature, Physics, Chemistry or English language. Hundreds of 0 score or more than 70% of historical essays with under five score got an attention of many research and the media.

In fact, History and Geography have distinctive characteristics in comparison with other subjects. Learners have no chance to observe directly or intuitively the past of any events, people or memories as the catastrophically atomic bombard in Japan in 1945 by the American troop or the dual disaster of earthquake and tsunami in Japan in 2011. The historical essence of both History and Geography is one of the most difficult aspects in the learning process of students, especially those in primary schools (from 6 to 11-year-old). However, learning History and Geography is similar to other subjects in terms of the cognitive process of thinking and reasoning. When teachers can apply information technology effectively to create a multimedia environment including pictures, videos, historical clips, infographics, I-Mind-Map; primary students are impressed with content visualizations in History and Geography, which make them easy to comprehend knowledge and fortify their learning capability.

In conclusion, applying information technology in teaching History and Geography in primary schools brings about both theoretical and practical meanings. To succeed in this IT application, pre-service and in-service teachers should be trained and supported with forming the competence to apply IT in their actual teaching.

3.2.3. Practical demands of providing the ability to apply IT in teaching for primary student teachers at Tay Nguyen University

Tay Nguyen University is a multidisciplinary university established in 1977. The pedagogical department of this university trains future teachers for secondary and primary schools. Training program in Primary Education started in 1997. In more than twenty years, there have been more than 2,000 graduated from Department of Primary Education. Most of graduates became primary teachers in Tay Nguyen and Southern Central Vietnam.

From new requirements of the fourth industrial revolution, Tay Nguyen University has paid attention to investing new and modern equipment to design a module of intergrating information science into the training program. This helps undergraduates have foundational knowledge and technical skills to discover studying online resources, and to use common softwares and tools and specific software for primary schools. From 2009 onwards, under sponsor of the Project
of Higher Education, Tay Nguyen University provides one technical classroom with 40 personal computers and one projector to serve only primary student teachers.

The training program of Department of Primary Education includes 120 credits (exclusive prescribed credits for Physical Education and National Defense Education). This program lasts for four years with eight academic semesters. Most modules are designed in responding to two main requirements of Vietnamese general education and specific demands of primary schools with most of undergraduates from an ethnic minority as Tay Nguyen where has 47 ethnics.

In this program, contents of information science and application of IT in teaching are provided in a module namely “Technical facilities and application of IT in teaching at primary schools” (Tay Nguyen University, 2017). This module is taught for undergraduates in the 3rd year with two credits (12.5 teaching hours, 25 experimental hours in the technical classroom and 50 self-learning hours at home). This module offers knowledge and basic skills of using technical devices and Microsoft PowerPoint app to design lessons for student teachers. However, with only two credits, this module just provides the basic knowledge to help undergraduates adapt to various subjects in primary schools. Regarding the subject of History and Geography, the content is integrated into other modules such as Nature and Society 1, History-Geography and Teaching Methodology. Their contents are taught in around 30.5 teaching hours, 65 experimental hours, and 90 self-learning hours. For that reason, this program provides general knowledge of History and Geography of Vietnam and the World, and of methodologies with teaching activities for various subjects. With that general content, student teachers have little time to improve their ability of applying information technology in teaching. Therefore, how to develop undergraduates’ capacity of applying IT becomes necessary and compulsory requirements of Tay Nguyen University [21].

3.3. Recommendations to form the ability of applying information technology in teaching History and Geography for primary student teachers at Tay Nguyen University

From the above theoretical research and practical requirements of both Vietnamese primary schools and Tay Nguyen University, we suggest three main proposals relating to Tay Nguyen University, its lecturers, and student teachers to specify student teachers’ capacity of using IT in teaching History and Geography.

3.3.1. General recommendation relating to Tay Nguyen University

Firstly, the University needs to formulate new requirements to standardize the application of IT in its program. This activity is one of the key factors in evaluating lecturers’ training and researching abilities, and their academic results. The new standardization in applying information technology in training activities creates many useful outcomes. Lecturers and other staff in the university will learn and update new knowledge about IT to serve the recent training demands. Student teachers can learn in a technical environment which is conducive to their creativity in addressing learning issues. In general, this proposal also focuses on Tay Nguyen University’s key strategy: “Value, Creativity and Integration”.
Secondly, Tay Nguyen University needs to improve its equipment-system, especially the infrastructure related to information technology to ensure that undergraduates can update new and modern results of technical science during their learning. Via that system, undergraduates learn in classrooms and self-study at home or at specific rooms. As Tay Nguyen University has a true awareness of the role of information technology, it can invest in infrastructure and other necessary tools for various subjects, especially for educating student teachers in Department of Primary Education. Multimedia classrooms need to be built synchronously with technical devices and softwares, high-speed wi-fi network, open-accessed online resources, and digital library. In doing so, the rector of Tay Nguyen University and other stakeholders can find financial supports from various resources. They can use a part of the regular training budget that Ministry of Education and Training provides annually, or they can call for fundings from other sponsors, research projects, agreements between Tay Nguyen University and primary schools in the areas to provide high-quality primary teachers in future. Besides, they can find money from other associated institutions for pre-service and in-service trainings, and from the educational socialization.

Thirdly, the department of research and constructing Tay Nguyen University’s training program needs to revise and design the general program to increase the time allocated for information technology in the department of Primary Education. It means that the credits of module relating to IT should be increased. The current Tay Nguyen University’s training program needs to be changed, updated to serve new requirements of the fourth industrial revolution and the comprehensive innovation of Vietnamese education. From July 2018, Ministry of Education and Training has required that the new training curriculum has to focus on establishing and developing undergraduates’ professional abilities and their behaviors. Being future teachers in primary schools, student teachers need to have professional knowledge and excellent teaching methods as well as to be mastery in applying information technology in teaching. To attain these qualifications, student teachers need to receive good instructions and have enough experimental hours. This requirement is opposite to the fact of training information technology for undergraduates as the credits for this subject are so low and unsatisfactory. Therefore, it is difficult to train effectively good elementary teachers. By increasing duration of learning information technology, undergraduates have more chance to study new technical knowledge and to experiment with their knowledge frequently. The University should also encourage and support lecturers to build online lessons, digitize their lectures and instructing exercises to help undergraduates with self-learning at home. As the training program has few credits of information technology, it is necessary to create and propose online lectures and modules for all student teachers to improve their technical skills and knowledge about multimedia and information technology in teaching specific subjects such as History and Geography or Nature and Society. By changing the training program and opening online modules, Tay Nguyen University creates more chances for undergraduates of Primary Education to discover, understand and practice IT into their professional subjects.
Fourthly, it is compulsory to conduct training workshops or seminars to provide and improve knowledge of applying information technology in teaching for both teacher educators and student teachers. It can be seen that the value and quality of any university depend on four major factors, including human resources, training program, infrastructure, and the ability to utilize information. Among them, human resource is the most significant factor that leads to the success of the university. Therefore, Tay Nguyen University can utilize human resources from various sources to conduct their training workshops about information technology. They can invite key speakers from the Microsoft Vietnam for the training because they have trained many pedagogical universities and colleges in the program namely “Teacher to the future”. It can also use lecturers of Department of Informatics or other lecturers in the University who are good in information technology for training. The content and program of the training workshops should be regulated and focus on integrated methodologies which are not only suitable for various subjects but also adapted with specific professional knowledge. Other boards or departments such as Trade Union and Youth Union will support the training progress by organizing or launching a competition in applying IT between lecturers to encourage them in studying and applying the results in teaching and research.

3.3.2. Recommendations for teacher educators at Tay Nguyen University

It is no doubt that lecturers who directly involve the training activities play an important role in the progress of forming and improving the ability to apply information technology in teaching History and Geography for undergraduates of Primary Education to adapt with new requirements of Vietnamese educational innovation. They must always maintain their awareness, responsibility for their profession and actively discover, understand and update new information in the changing situation to secure their teaching quality. Vietnamese general and comprehensive educational innovation and the fourth industrial revolution shows that all teachers need three elements to improve their teaching quality. They are professional knowledge (key or initial factor), excellently teaching methodology (to show undergraduates how to learn and teach), and information technology (the effective tool in the period of the fourth industrial revolution). All three above factors have a close relationship as they can support each other and be suitable for the mentioned model TPACK. It means that lecturers need technological knowledge (TK), content knowledge (CK) and pedagogical knowledge (PK). To gain all the above requirements, lecturers need to not only involve in training workshops or courses about applying information technology in teaching but also self-study and arm themselves with the knowledge and skills in specific subjects.

Lecturers and especially those teaching modules relating to the application of IT in teaching activities or to subjects of History and Geography for undergraduates of Department of Primary Education have to renovate teaching contents and methodology, assessments proactively towards improving student teachers’ ability to use IT for their learning. For example, in each module, they can create various types of exercise for undergraduates such as using information technology to discover and analyze data, pictures collected from the Internet, designing an online program to present in learning
seminars, or preparing digital lessons for pre-pedagogical internships (practicum). By addressing each learning target, undergraduates gradually practice and experiment their skills of applying information technology in learning to improve their IT ability. However, information technology cannot replace professional knowledge and teaching approaches. Therefore, lecturers need to apply the model TPACK in training progress to create professional teachers [22]. Lecturers also need to perform and combine different teaching activities such as face to face, blended learning, or e-learning, to improve their training quality.

Moreover, lecturers need to encourage undergraduates of the Department of Primary Education to form and develop their competence to apply information technology into teaching specific subjects, especially History and Geography. As mentioned above, credits for IT-related modules are relatively few and not enough for the training program. As undergraduates spend little time on self-learning and experimenting in their specific subjects, it is difficult for them to manage, and apply effectively information technology at teaching in primary schools after graduating. To help undergraduates, lecturers need to provide and share their online lessons about History and Geography as reference materials for undergraduates. They also can introduce online training workshops or coursework relating to IT via social networks like Facebook, Edmodo to help them in self-learning and self-practicing.

Finally, lecturers of Tay Nguyen University need to discuss and collaborate in training progress to have suitable approaches to help undergraduates in establishment and improvement of ability to apply information technology. As such, the professional group of History and Geography of Department of Society should conduct frequent seminars sharing lecturers’ experiences of utilizing information technology in training progress to revise and update new and necessary contents and teaching methods. They also need to cooperate with the Youth Union to organize the Professional Pedagogical Contest annually (in November) to help undergraduates to apply information technology in learning and teaching. Forming and maintaining an academic network to discuss methods of using information technology in teaching History and Geography are meaningful and significant to establish and develop undergraduates’ abilities.

### 3.3.3. Recommendations for student teachers in the Department of Primary Education, Tay Nguyen University

Forming and developing the competence of applying information technology depend on learners who receive the training activities while the university’s management and teaching issues are supplementary factors.

In the training progress, student teachers’ roles are both objective and subjective. Being objective is seen from the aspect that they receive training activities with clear target, content and learning environment. Being subjective is shown in their involvement in their learning and proactiveness in gather and absorb professional knowledge, teaching methodologies, and technical skills. If the learners do not understand their responsibility and professional requirements about knowledge and technology, the training progress will fail. For that reason, during the training progress, student teachers not only aware their occupied responsibility but also attempt to achieve knowledge actively to become good primary teachers in future.
4. Conclusions

Forming the capacity of applying information technology for student teachers in general and those of the Department of Primary Education, Tay Nguyen University in particular, in teaching History and Geography contributes the theoretical and practical significance. By investigating previous studies done by international and Vietnamese scholars, this paper offers more theoretical and practical insights and especially suggest three main recommendations for lecturers and undergraduates of Tay Nguyen University. All recommendations have a close relationship. However, due to limitations of the research, we only provide some general proposals. It is necessary to study further to validate the above proposals’ influence in real educational environment. Methodologies to effectively combine information technology into the training program of pedagogical undergraduates, especially modules related to applying information technology in teaching History and Geography are in need. Finally, it is necessary to build suitable evaluation criteria for establishing the competence of applying information technology for undergraduates of Primary Education Department at Tay Nguyen University in teaching History and Geography.

References


HÌNH THÀNH NĂNG LỰC ỨNG DỤNG CÔNG NGHỆ THÔNG TIN TRONG DẠY HỌC LỊCH SỬ VÀ ĐỊA LÍ CHO SINH VIÊN NGÀNH GIÁO DỤC TIỂU HỌC - TRƯỜNG ĐẠI HỌC TÂY NGUYỄN, VIỆT NAM

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Tóm tắt

Năng lực ứng dụng công nghệ thông tin trong dạy học Lịch sử, Địa lý nói riêng và đào tạo sinh viên sư phạm nói chung là một trong những năng lực nghề nghiệp quan trọng nhất của giáo viên tiểu học trước yêu cầu đổi mới của cuộc cách mạng công nghiệp lần thứ tư và sự đổi mới gần đây của giáo dục Việt Nam. Vì lẽ đó, việc trang bị cho sinh viên khối Giáo dục Tiểu học năng lực ứng dụng công nghệ thông tin (gọi tắt là CNTT) là phù hợp và cần thiết trong điều kiện giáo dục Việt Nam. Vì vậy, bài viết tập trung trình bày một số vấn đề về khái niệm năng lực ứng dụng CNTT, sự cần thiết hình thành năng lực này cho sinh viên đại học Giáo dục Tiểu học trong dạy học Lịch sử và Địa lý (thông qua nghiên cứu trường hợp sinh viên đại học Tây Nguyên) và những đề xuất nâng cao năng lực cho sinh viên đại học một cách hiệu quả.

Từ khóa: Giáo dục Tiểu học, Trường Đại học Tây Nguyên, năng lực, công nghệ thông tin, Lịch sử và Địa lý.