

Factors affecting the application of digital technology in examination and assessment in high schools in Viet Nam

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Abstract:

The application of digital technology in education is an indispensable trend of today's education systems in the world, this is also a very necessary skill for teachers in the 4.0 technology era, and can be considered as the key of innovation, improvement the quality of education, to develop a modern education. In the process of teaching, examination and assessment is a very important activity, helping to assess students' competence, determine the level of achievement of students' educational goals; The application of digital technology in examination and assessment activities is influenced by many objective and subjective factors, so the research of these factors has high practical significance and is an important basis for widely deploying and applying digital technology, improving the efficiency and quality of this activity. The main research methods used are: research, synthesis, analysis document and expert method.

Keywords: Digital technology, examination, assessment, education, Viet Nam

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I. Introduction

Education in Viet Nam is having fundamental and comprehensive changes in order to improve the quality and effectiveness of educational activities, towards a modern education that meets the requirements of the country's reality in the integration context. To develop a modern education, technology is an indispensable factor; the 4.0 technology era has placed Viet Nam's education in front of opportunities to promote the application of digital technology in all activities of the teaching process, including examination and assessment with the popularity of the Internet, computers and the strong development of applications and software. Examination and assessment is an activity that plays a very important role in the teaching process in order to assessing the learning results and level of achievement of the educational goals. However, the implementation of applying digital technology in practice is still influenced by many different objective and subjective factors; In Viet Nam, these factors are quite clearly differentiated between teachers and students, and between different regions and localities. Therefore, it is necessary to research carefully and assess exactly the impact of these factors on the application of digital technology in examination and assessment, and the problem is how to reduce the disparity between localities about these factors, ensuring equity in education, thereby offering appropriate solutions to improve the quality and effectiveness of examination and assessment through the application of digital technology.

II. Material And Methods

To obtain the research results in this article, the author used specific, appropriate and meaningful scientific research methods: (i) *Methods of research, synthesis and analysis of documents*: Document, book, newspaper, specialized journal, works, research topics that have been accepted and other scientific works related to the organization of teaching, examining, assessing and develop competence of students, applying digital technology in teaching; (ii) *Expert method*: during the research, the author consulted researchers and experts in the fields of educational science and information technology to have a comprehensive and accurate, objective, scientific perspective to research problems.

III. Result

1. The role of examination and assessment in education

Examination and assessment is an activity that plays a very important role in education, this activity provides accurate and timely information, determines learning and training achievements according to the level of satisfaction required to be achieved of the general education program and the progress of students to guide

learning activities, adjust teaching and learning activities in order to improve the quality of education. Examination and assessment are meaningful for teachers, students, parents, and administrators, social organizations.

- Examination and assessment helps teachers adjust and renew organizational forms and educational methods in the process of teaching and education; promptly detect the efforts and progress of students in order to motivate, encourage and detect difficulties that cannot be overcome by themselves to guide and help to improve the quality and effectiveness of learning and training activities of student, contributing to the achievement of educational goals.

- Examination and assessment helps students have the ability to self-comment and participate in comments; self-study and self-regulate learning; communication and cooperation; be interested in learning and training to improve.

- Examination and assessment helps students' parents to participate in assessing the process and results of learning and training, the process of forming and developing students' qualities and competences; actively cooperate with schools in student education.

- Examination and assessment helps education administrators at all levels promptly direct educational activities, innovate teaching methods and assessment methods to achieve high efficiency in education. Helping social organizations obtain accurate and objective information, promote social resources to invest in education development. [1][2]

2. Applying digital technology in teaching

Digital technology is a new concept that has been formed in recent times associated with the 4.0 Revolution. The 4.0 technology era associated with the 4th Science and Technology Revolution (4.0 Revolution) is going strongly all over the world, this is a transition from traditional operating models to modern models based on digital technology platform. This revolution has far-reaching effects on all fields of social life, to countries and regions all over the world. Digital technology is a modern technology that is formed, developed and operates on the basis of: Big data, Internet, cloud computing (ICloud), in which data is digitized, stored, analyzed and processed to create new values applied in practice. [3]

Applying Digital technology is the use of digital technology in different fields to change the method of operation, data storage and management in order to improve the quality and efficiency of work, including the field of education.

Applying digital technology in teaching activities is the use of scientific methods, technology and modern technical tools to exploit and exchange digital information, effectively serving educational activities. Specifically, it is the use of computers, computer software and other technology devices in lesson preparation, teaching, examination, assessment, and supporting students' learning and research in order to develop profession. [4][5]

3. Factors affecting the application of digital technology in examination and assessment

The application of digital technology in examining and assessing the results of teaching Geography in high schools is very necessary, especially in the context of the 4.0 technology era that has been developing strongly in many countries and regions around the world. However, the application of digital technology depends on many objective and subjective factors of teachers and students. It is necessary to understand these factors in order to have effective and feasible orientations and solutions in the coming time to improve the quality of this activity when applying digital technology.

3.1. Objective factors

*** Reality context**

The birth of the Fourth Industrial Revolution has opened a new era - the 4.0 technology era based on the Internet network and big data sources, which greatly affects all fields of social life, including education. In order to improve the quality of education, training and fostering talents to serve the country's socio-economic development, education in developing countries, including Vietnam, needs have reforms and new directions, breakthrough; change from traditional teaching methods to active teaching methods; promote positivity, initiative and creativity in the direction of developing students' competence. In the traditional teaching method, students mainly acquire knowledge and skills through books, from the teacher's communication; however, with modern and active teaching methods, students can fully self-study and self-research on the basis of teachers' orientation with rich materials from many different sources anytime, anywhere, learning according to students' needs and abilities with the effective support of the Internet and a big data system. In modern teaching, the teacher must be a "digital teacher", the learner must be a "digital learner" based on the "digital technology" platform to be able to exploit and acquire knowledge and develop the competence of the students themselves.

The 4.0 technology era has given great opportunities and challenges for the education of countries around the world. Opportunities in expanding accessibility to rich and diverse sources of information and data with the support of computers and the Internet, It is an important basis for the development of a modern education; However, it also gives a challenge in terms of the ability to apply digital technology, the technical infrastructure system and the competence of teachers and learners in the countries, especially developing and underdeveloped countries. Thus, it is clear that digital technology has a positive influence on teaching activities, is a condition to improve the quality of education, the problem is that it is necessary to take the opportunities, and simultaneously overcome the challenges that are 4.0 technology era gives for education.

The reality context has had a great impact on the application of digital technology in teaching, which has been proven through reality. From the beginning of 2020 until now, the appearance of the COVID-19 epidemic has changed all human's activities, and education is no exception. Online teaching has become a prominent trend of the world in recent years. Computers, the Internet, applications and software have actively supported education, overcoming the situation of social distancing, and ensuring that education can take place normally. Organizing seminars, training, teaching, examining and assessing are all performed online, this fact once again proves the impact and role of digital technology in the education.

**** Policy, orientation, fostering and training on digital technology application in examing and assessing of the Ministry of Education and Training***

In the past time, with the spirit of fundamental and comprehensive innovation in education and development of a modern education, the Ministry of Education and Training has given opinions and orientations in examining and assessing activities in high schools, simultaneously promoting the application of digital technology in these activities.

Viet Nam's education identifies examining and assessing as an activity of great significance to the development of education; continue to improve the quality and efficiency of this activity in a modern direction, fundamentally renew the form and method of examination and assessment of education and training results, ensuring honesty and objectivity; the examination and assessment of education and training results should be step by step according to advanced criteria trusted and recognized by society and the world educational community; coordinate the use of assessment results during the learning process with the end-of-term and end-of-year assessment; teacher's assessment with learner's self-assessment; assessment of the school with the assessment of the family and the society.

The Ministry of Education and Training attaches special importance to the application of digital technology in teaching methods innovation, examination and assessment. Encourage teachers to actively prepare lesson plans, lectures and teaching materials that apply digital technology in their subjects. Encourage teachers to actively apply digital technology in teaching activities, design lessons using slides, electronic lectures and lesson plans on computers; apply digital technology in examining and assessing activities to improve the quality and efficiency, ensure the fairness and objectivity of this activity, and properly reflect the students' competence. [6]

In order to put these activities into practice, the education nationwide and locally has organized seminars, training and fostering of teachers to promote the application of digital technology in examination and assessment. Thanks to seminars, training and fostering, teachers better understand the role of information technology, understand its features, advantages, limitations, application methods, and ways of deploying applications, software in the practice of teaching, examining and assessing. Since then, digital technology has quickly been applied in high schools with many subjects, including Geography.

**** Facilities conditions of the school and localities***

The 4.0 technology era is an era when people depend a lot on technology and technical equipment and means, especially the Internet, computers and indispensable sources of energy - electricity, from that applications and software are designed and developed to meet the diverse needs and uses of teachers and students in the teaching process.

Thus, in order to apply digital technology, applications and software in the teaching process into reality, to concretize the policies and orientations of the Ministry of Education in schools, schools need to invest, ensure the facilities, equipment and technical means to meet the actual requirements. However, the investment in material and technical facilities in the schools depends on the resources and development conditions of each school and each locality. Vietnam is a developing country, socio-economic conditions still face many difficulties, there is a clear division between mountainous and plain, rural and urban areas, so the investment in technical facilities is very difference between localities. In the delta and urban areas, with better socio-economic development conditions, the investment in equipping computers, projectors, and the Internet...will be easy, convenient, complete, modern, and good quality; On the contrary, in mountainous, rural and remote areas with limited development conditions have a great influence on the investment in facilities and

these technical means, so the application of these software and digital technology in teaching and learning will also face difficulties.

It can be seen that the school's infrastructure condition in the localities is a very important factor to deploy the application of digital technology in teaching activities, including examining, assessing. It can be affirmed that without computers, without the Internet, it is impossible to deploy digital technology applications in teaching. The problem is that the Government, the Ministry of Education, localities and the whole society need to pay attention to invest and support disadvantaged areas in terms of material and technical facilities, meeting the minimum requirements of reality to ensure equity in education, widely apply digital technology to teaching in reality.

*** *Support of the community, colleagues***

Besides the above-mentioned objective factors, the support of the community and colleagues is also a factor that has a positive impact on the application of digital technology in teaching of teachers. An excellent individual will not be able to create the development of the whole education system, but requires the efforts of the whole community. Each teacher will have certain strengths and competences, but to be able to expand knowledge and develop competence, the support of colleagues and the community of teachers will be very important.

Participating in communities and forums related to education, teaching and digital technology will be an opportunity for teachers to exchange and share experiences with each other; teachers can share their experiences, and at the same time receive experiences from other teachers, have questions answered, technical and professional support...And especially, participate in the community and forum will have a significant impact on teachers' awareness in the issue of educational innovation, promoting the application of digital technology in teaching. The formation and development of communities, forums to exchange and share experiences in teaching is also a prominent trend of education today, especially in the context of online teaching due to the influence of the COVID epidemic. The support of the community and colleagues will contribute to promoting the widely implementation of digital technology applications in teaching, examining and assessing.

3.2. Subjective factors

*** *Awareness of teachers and students***

The awareness of teachers and students is the first important factor in the group of objective factors that affect the application of digital technology in teaching, examining and assessing; Only from awareness can there be specific actions, the application of digital technology in education will be difficult to deploy and promote effectively in the 4.0 technology era without this factor.

First of all, teachers and students need to be aware of the impact and requirements of the 4.0 technology era on all fields of social life, including education. Education needs to be renewed towards improving quality, efficiency, and developing students' competence; that request can be implemented quickly, easily, efficiently, conveniently, ensuring fairness and objectivity in examining and assessing with the support of current educational applications and software. The fact that the impact of the COVID-19 epidemic in the past time has proved the necessity of online teaching, examining and assessing thanks to the application of digital technology.

Next, teachers need to realize that: self-renewal is an important condition for educational innovation in a positive and modern direction. In the era of digital technology 4.0, teachers must become "digital teachers", students must also be "digital learners". Teachers need to replace traditional teaching methods with modern, active teaching methods, aiming to develop students' competence by using application software for teaching, examining and assessing; continuously self-study, self-research, update and deploy rapidly changing technology applications to meet the needs of learners; teachers need to master technology, thereby being ready to guide and support learners to access, use and inspire learners to be able to exploit the huge sources of digital data for teaching. Learners also need to be active, self-study and self-study based on the guidance of teachers to exploit data sources for their learning activities; learners can apply digital technology to learn anytime, anywhere, actively choose learning content, learn according to their interests, abilities and needs; This will make students more active and have more conditions to develop their own competence in the digital age. For a relatively long time ago, the "afraid" mentality of teachers and students to innovate significantly affected the quality of education; Therefore, the awareness of teachers and students about innovation and digital technology is a very important factor, which is the orientation for digital technology application activities in teaching.

*** *Technical infrastructure conditions of teachers and students***

The technical infrastructure conditions of teachers and students are also an important factor to be able to apply digital technology in teaching, examining and assessing. Digital technology helps teaching activities take place regularly, continuously, anytime, anywhere by online form; implementing teaching, examining and

assessing activities with the support of applications and software; exploiting data and information for teaching and even creating interest in teaching for both teachers and students...As analyzed above, the same as technical infrastructure conditions of school and localities. This is a factor that helps to apply digital technology to teaching and learning reality with the support of computers and the Internet. However, in this condition, there is a clear distinction between education in plains and urban areas and education in mountainous and rural areas, among localities. It will be difficult to ensure equity in education without paying attention to investment in technical means for education in mountainous and remote areas; This is a problem for managers in promoting investment and supporting technical infrastructure for teachers, students, schools and localities.

*** *Qualifications of teachers and students***

Beside the awareness factor and technical infrastructure conditions of teachers and students, qualifications are also an important factor. Not only have professional knowledge and pedagogical competence, teachers need to be equipped, fostered and regularly self-study theoretical knowledge about teaching, examination assessment, methods and teaching techniques towards developing students' competence in a new context. In particular, teachers need to be fostered and trained in the competence to apply information technology in teaching, examining and assessing; guide the use of technological equipment, understand the advantages, limitations and features of applications and software for the organization of these activities in specific situations. It will be difficult to apply digital technology into reality when teachers have limited qualifications even if they are equipped with modern technological means. Participating in fostering, trainings courses, communities, forums, combined with self-study and self-research will help teachers have more knowledge, skills and techniques to meet the requirements of reality, improve the quality and effectiveness of teaching, examining and assessing activities under the support of digital technology.

However, the qualifications of teachers related to the application of digital technology and information technology are still very limited because the application of digital technology in teaching, examining and assessing of the 4.0 technology era is only really focused in recent years. The team of teachers trained in the previous period did not have regular contact with technology, the application of information technology in teaching only stopped at simple operations along with limitations in terms of technical infrastructure conditions. Compared with young teachers, previous generations of teachers will face many difficulties in adapting to the change of reality, especially the rapid change of science and technology; young teachers with dynamism, creativity and sensitivity to technology will easily adapt to change; This fact poses a problem that needs to be fostered, trained and improved qualifications for teachers widely and widely.

If teachers need certain qualifications to be able to apply digital technology in teaching, examining and assessing, students also need to be qualified to apply digital technology for their own learning. There is also a difference in the qualifications of students between localities, students in areas with favorable conditions for development, accessing and using technology devices, applications and software take place early and have many advantages, while students in disadvantaged areas are completely opposite. The problem here is still the differentiation between development conditions. In order to limit this problem and reduce the difference in qualifications, besides increasing investment in technical infrastructure, teachers need to be pioneers, guide and inspire students in the application of digital technology for learning.

4. Solutions to promote the application of digital technology in innovation in examining and assessing teaching results

In order to promote the application of digital technology in innovation activities of examining and assessing teaching results in high schools, improving the quality and effectiveness of this activity in the direction of developing students' competence, it is necessary to focus on the following main solutions:

- Teachers need to be aware of the role of examination and assessment activities in the teaching process for students' competence development. Understand the orientation of examining and assessing students in the current educational context: a combination of regular assessment and periodical assessment, teacher's assessment and student's self-assessment, school's assessment and assessment of family and community; combining the form of objective multiple-choice assessment and essay in order to promote the advantages of each of these forms of assessment; develop appropriate assessment tools for comprehensive, fair, honest, and categorical assessment, helping teachers and students to timely adjust teaching and learning.

- Strengthen training for teachers on examination and assessment activities in the teaching process in the direction of developing students' competence. Fostering and improving the computer skills of teachers, the ability to apply digital technology to the teaching process, including examination and assessment activities.

- Promoting investment, modernize and develop a system of material and technical facilities, infrastructure serving the application of digital technology in examination and assessment, especially computer systems, networks Internet. Prioritize investment and development of material and technical facilities for areas

facing many socio-economic difficulties in order to reduce the disparity between localities in the ability to apply digital technology to the teaching process.

- Developing strongly softwares which supports actively, effectively, easily to deploy and has high applicability in examining and assessing teaching results. [7]

IV. Discussion

Examination and assessment is an activity that plays a very important role in the teaching process in each school, the application of digital technology in examining and assessing will contribute to improving the quality and effectiveness of this activities. This ensures fairness and objectivity in assessment, towards the comprehensive development of students' competences. The application of digital technology in examining and assessing is affected by many objective and subjective factors of teachers and students, in which objective factors play an important role, subjective factors play a decisive role. Through research and field surveys, interviews with teachers and students, and consultation with experts in the field of education, it can be found that: under the influence of factors, the application of digital technology in examining and assessing has achieved many positive results. However, there are also certain limitations such as: the examination mainly focuses on the requirement to reappear knowledge and assessing through scores, which has led to a situation where teachers and students maintain traditional teaching, learning is more about memorization, less interested in applying knowledge; examining and assessing activities in the process of organizing teaching activities in the classroom have not been paid attention to and implemented in a scientific and effective manner; the application of digital technology in these activities has not been popularized and implemented not really effectively; teachers' competence to apply digital technology is still limited...The above limitations are from the division in development conditions among teachers, students and between localities. The problem for managers is to provide appropriate orientations and solutions to reduce the disparity between localities in terms of conditions for accessing digital technology, so that the application of digital technology in examination and assessment is popular and effective.

V. Conclusion

Examination and assessment is an important activity in the teaching process, the application of digital technology in examination and assessment is influenced by objective and subjective factors of teachers and students. These factors have a reciprocal relationship, determining the ability to apply digital technology in this activity in high schools. Therefore, it is necessary to research and understand the influence of these factors and especially the differentiation of factors between localities in order to be able to give reasonable solutions and orientations to help improve quality and the effectiveness of examination and assessment activities in high schools.

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