



Review Article

Policy Transformations about ICT Applying in Learning and Teaching in Vietnamese General Educational System

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Abstract: Information Communication Technology (ICT) has an important place in the educational innovation program. New policies on educational innovation are built on the premises and prospects of effective ICT application in teaching and learning (Richards, 2004). Studies on ICT application in teaching and Electronic Book or Digital Hybrid Text in Education and Training have been researched and developed by several countries in the US and Europe. This article analyzes some policies for ICT application in teaching and educational innovation in Vietnam. These policies are analyzed according to the approaches to the Government of Vietnam Orientation on the application of information technology in education; The Ministry of Education and Training's policies on the Vietnamese education renovation requirements, ICT equipment infrastructure, the capacity of teachers to apply ICT in teaching. The research results show that the government has tried to give directions for ICT to be widely applied from management to teaching activities. The Ministry of Education and Training has also issued circulars and specific instructions to promptly implement orientations from the government. However, the approach to applying ICT in education has many multidimensional and too broad theoretical bases. The instructions on ICT are too sketchy and not yet specific for the application of ICT in teaching and learning.

Keywords: Policy, ICT, education, management, teaching and learning.

1. Introduction

Living in the digital age and in a knowledge-based society, Information and Communication Technology (ICT) plays a

major role in almost every aspect of the modern life and particularly in education [1]. ICT plays an important role in the educational reform. New educational reform policies have been developed based on the premises and prospects of the ICT application in teaching and learning [2]. ICT and Education forum towards 2030 has raised 14 statements on the orientation of the

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ICT application in Education aiming for the stable global development.

It meets Unesco declaration for Education 2030 which has Goal # 4 “Towards inclusive and equitable quality education and lifelong learning for all” [3]. The research team recommends the following five priority areas for the integration of ICT with a view to achieving the Education 2030 agenda. Relating to the importance and orientation of IT application in improving teacher quality, it said: “UNESCO’s ICT Competency Framework for Teachers addresses all aspects of a teacher’s work using three approaches to teaching: “technology literacy” for more efficient teaching and learning and the achievement of education goals such as increased school enrolments, highquality educational resources for all and improved basic literacy skills; “knowledge deepening” for gaining in-depth knowledge of school subjects and applying that knowledge to solve complex problems in the real world; and “knowledge creation”, which enables citizens and workforces to create the knowledge required for more harmonious, fulfilling and prosperous societies [4]; It again emphasizes about ICT for improving access to and quality of secondary education “In response to the emerging needs of learners and teachers in a knowledge society, secondary education can be redesigned and restructured to promote innovative teaching and learning practices” [5]. ICT for enabling inclusive and equitable learning refers to how ICT can assist in enhancing the competencies of girls, women and vulnerable groups and can help to ensure that no one is left behind. For example, online and ICT-enabled channels can expand informal and non-formal education opportunities [6].

Many countries have realized the importance of ICT in education. The strategic policies may propose basis for argument, purposes and the vision of the educational system with the application of ICT [7]. Therefore, they issued relative education policies and invested in ICT-related hardware, software, internet access in the school and teacher training [8, 9].

During the 2007-2011 period, Finnish government established a national strategy on the Information society prioritizing the application of ICT in education. This strategy aims at a general plan at a national level with 8 big objectives and 43 activities need to be achieved within the field of education: national objectives and a systematic change; learners’ skills in the future; pedagogical and practical models; e-learning and applications; infrastructure and supporting services; identifying and training qualified teachers; managing and leading culture within schools; administrating and cooperations. Finland has been at the top of international comparative assessments of learning outcomes for almost ten years now. The factors that have led to this success are not the same ones that will keep us at the top for the next ten years,... In order for Finland to retain its position as a top country in education, schools need to make diverse use of the opportunities provided by ICT and media [10].

Studies about application of ICT, E-books and DHT to education has been carried out and developed by countries like the US and other European countries [11]. The study on promoting the application of ICT in schools confirmed that learning with the aid of ICT has certain benefits such as: learners can interact with the virtual learning environment, personalized learning process and can actively engaging in the process individually.

Lots of American publishing companies as well as tech corporations have spent a considerable amount of effort in developing techs and contents related to e-textbooks. iBooks from Apple has been said by the Guardian to be: “redefining textbooks”. After the release of this technology, Houghton Mifflin Harcourt, McGraw Hill Education and Pearson Education (90% the textbook market) have compiled dozens of interactive e-textbooks on the iBooks platform. Amazon, the corporation with the biggest e-book retailing website has come up with the 80% discount policy when leasing textbooks on Kindle products.

At the end of 6/2011, the Korean government has announced the “Strategy to promote Smart Education” with the budget of 2.07 bil USD aiming to elevate the competitiveness of Korean education to top 10 global by 2015 and top 3 by 2025. According to this strategy, by 2015 all middle and high school students will be studying through e-textbooks and other electronic devices.

In 2010 Japan has initialized the Future School project. According to this project, all under 12 students will be provided tablets and there will be electronic interactive blackboards in classrooms. Connected devices enable students to view Kanji characters on screens or discussing over a virtual sheet of paper in real time, while the teachers supervise through computers.

This study aims to demonstrate results of an observation on the implementation of the ICT application policies in education. The study is going to provide the reader with the history of some policies on the application of ICT in education. The results of implementing these policies during the preparation phase of the educational reform period in Vietnamese general education. Some aspects were analyzed such as the investments in ICT infrastructure and teachers’ readiness in using ICT for teaching.

2. Methodology

This study analyzed three major government-level policies guiding orientations for the application of IT in education from 2007 to present. At the same time, analyze 5 circulars, instructions on IT application in education and 3 instructions on IT application in teaching in the school years 2017, 2018, 2019.

Vietnam conducts education and training reform under the orientations of the Resolution of the 8th Conference, the XI Central Executive Committee (Resolution No. 29-NQ/TW) on the fundamental and comprehensive renovation of Education and Training to meet the needs of industrialization and modernization in the socialist-oriented market economy and international integration. This study on ICT

application policy in general education in Vietnam is divided into two phases: Orientations/policies issued before Resolution 29 -NQ/TW; and ii) Orientations/policies issued after Resolution 29 -NQ/TW.

Policy analysis is based on important research methods and results of social science, social professions and political philosophy [12]. This method is some what descriptive because it relies on on social sciences to make and justify claims about cause and outcome of the policies. However, this method is standard because it relates to the choice of purpose and appropriate means which is a process based on moral and the requirement of fairness, efficiency, transluence, freedom and democracy [13].

Policy research refers to “all studies that use scientific methods to describe phenomena and/or determine the relationships between them”. “Not that we have too many good analytical solutions for problems. Rather, we have better solutions than appropriate actions” [14]. Policy analysis looks back on the creation and transformation of information after policies have been implemented. Problem-oriented analysis seeks to describe the causes and consequences of policies.

The outcome of the policy is the extent to which a policy observation can contribute to achieving unrealized values or opportunities for improvement, which, by definition, are the problems with policy. In practice, the outcome of the policy is always incomplete, because problems are rarely resolved, they are often re-resolved, re-presented, or even left “unresolved” [15]. This study desires to present the extent to which the use of ICT can be utilized, through the method of collecting information and observing relevant policies, as well as information about the contribution of these results on achieving unfulfilled values and an opportunity to improve the expected policy results.

A policy related issue is an unfulfilled value or an opportunity for improvement, which can be achieved through government actions [16]. The result of ICT application in teaching policy

is expected to be a possible result of a policy designed to solve that problem. A priority policy is a potential solution to a problem. An observable result of a policy can be the observed results from the past or the present of a priority policy. Many countries have given a considerable amount of concern as well as issued appropriate policies. E-book or DHT application is one of the components of ICT application in schools. In order to know whether the use of E-books or DHT in schools in Vietnam can be solved, there needs to be information about its prerequisites such as teachers' ability to design DHT, the infrastructure of the education system (internet, server, domain names) that achieving them can lead to a solution to the problem. Information on these relevant policies plays a key role in policy analysis, because the way a problem is defined will shape the search for possible solutions.

3. Results and Discussion

3.1. *The Orientation of the Vietnamese Government on the Application of Information Technology in Education*

Orientations Issued Before Resolution 29 - NQ/TW

Decree No. 64/2007/ND-CP dated April 10, 2007 of the Government on the application of ICT in the operation of state agencies, is the use of ICT in the activities of state agencies in order to improve the quality and efficiency of internal activities of state agencies and between state agencies, in the transactions of these agencies with organizations and individuals, to support promoting administrative reform and ensuring publicity and transparency [16].

Vietnam Education Development Strategy 2011-2020 proposes 8 solutions for educational development during the 2011-2020 period. The first solution is called a breakthrough in "Educational management innovation", in which promotes "Promoting the application of ICT to improve the effectiveness of education

management at the levels". The second solution is called key, which contains the content on "Developing continuing education programs, applying ICT to expand learning methods to meet the diverse learning needs of people, help learners improve their personality, expand their knowledge, improve their academic and professional qualifications in accordance with work requirements and to improve quality of life" [18].

Directive No. 02/CT-TTg dated January 22, 2013 of the Prime Minister on the implementation of Conclusion No. 51-KL/TW dated October 29, 2012 of the 6th Central Committee of the Party XI on the Project "Basic and comprehensive innovation of education and training, meeting the requirements of industrialization and modernization in the context of socialist-oriented market economy and international integration". Directive for the Ministry of Education and Training (MoET) to implement 8 contents including (g) Promote the implementation of projects on foreign language teaching and learning, developing ICT in the national education system. To coordinate with the Ministry of Labor, War Invalids and Social Affairs in adding foreign language teaching and learning contents to vocational training units to the scheme on teaching and learning foreign languages in the national education system till 2020; organizing a symposium on post-secondary student sector and developing implementation policies [19].

Orientations issued after Resolution 29 - NQ/TW

The project "Enhancing the application of ICT in managing and supporting teaching and learning activities, scientific research, contributing to improving the quality of education and training during the 2016-2020 period, orientation to 2025" No. 117/QĐ-TTg has just been approved by the Prime Minister on January 25, 2017 [20]. Accordingly, by 2020, strive for 100% of state management agencies in education and training, institutions to carry out handling administrative management work in the network environment;

70% of meetings between state management agencies and institutions are carried out online. 70% of professional fostering classes for teachers and education management staff are

carried out via the network using the blended learning method; 50% of administrative records are processed online at least at level 3, of which 30% is handled online at level 4.

Table 1. Process to issue decrees and decisions on IT application for education by the Government of Vietnam

No	No of policies & year of issued	Contents of policies
1	64/2007/NĐ-CP (2007)	Application of ICT in the operation of state agencies [17]
2	72/2013/NĐ-CP (2013)	Management, provision and use of internet and information services [21]
3	117/QĐ-TTg (2017)	Enhancing the application of ICT in managing and supporting teaching and learning activities, scientific research, contributing to improving the quality of education and training during the 2016-2020 period, orientation to 2025 [20]

3.2. Educational Policy by the Ministry Level

Orientations issued before Resolution 29 - NQ/TW

In the year 2010, MoET issued Circular No. 08/2010 / TT-BGDĐT (2010) [25] providing for the use of free and open source software in educational institutions. This regulation applies to educational institutions from preschool to university and educational authorities.

Then, in the year 2012, MoET issued Circular No.53/2012/TT-BGDĐT (2012) [26] providing for the organization, operation and use of e-mails and web portal at the Department of Education and Training, education and training offices, preschool education institutions, general education and continuing education. This document regulates the organization, operation and use of electronic mail (e-mail) and web portal at the departments of education and training, education and training offices and preschool education institutions, general education and continuing education to ensure communication in the field of education and training, serving the management, administration and information disclosure of education authorities departments, divisions and affiliated educational establishments.

Orientations issued after Resolution 29 - NQ/TW.

For education and training, ICT has a strong impact, constantly changing teaching and learning methods. ICT is a means to move towards a learning society. Based on the orientation of the Government such as: ICT Law, Decree 64/2007/ND-CP, the MoET has approved the Plan of ICT application during the period of 2016 - 2020 of the MoET with the goal: “Develop the Electronic MoET with modernized and centralized infrastructure, unified integrated information, inter-administrative, ICT enhanced application in state management, e-government development, online public service provision; content innovation, teaching and learning methods, assessment and scientific research to meet the requirements of improving the quality of education and training in the new era” [17].

Plan No. 345/KH-BGDĐT dated May 23, 2017 was issued to implement the Project “Enhancing the application of ICT in managing and supporting teaching and learning activities and scientific research in order to contribute in improving the quality of education and training during the 2016 - 2020 period, orientation to 2025” [22]. This is an important step for the education sector at the time of implementing

many education reform programs such as National Teacher Education Program. Educational institutions continue to build specific plans of their units to have appropriate development direction for school management as well as professional development, innovating teaching methods, assessment. In order to synchronize the implementation of applying information technology to higher education institutions, pedagogical colleges, MoET issued Official Letter 4966/ BGDĐT-IT in 2019 to reviewing conditions for IT application in management and teaching [23].

Continue to implement the ICT application plan, to enhance and develop teachers'

professional skills, MoET has issued related documents. At the same time, promulgating the Regulation No. 21/2017/BGDĐT on ICT application in training activities for teachers, staff and education managers over the Internet [24]. The promulgation of this regulation is a premise to implement the action plan for the development of training and retraining programs for teachers and education managers in the direction of enhancing the application of ICT in teaching and management. Thematic subjects and subjects related to the application of ICT in teaching - assessing and evaluating educational management are defined as one of the compulsory subjects.

Table 2. Process to issues circulars and plans on IT application in teaching and learning by Ministry of Education and Training

No	No of policies & year of issued	Contents of policies
1	08/2010/TT-BGDĐT (2010)	using free and open source software in educational institutions [25].
2	53/2012/TT-BGDĐT (2012)	regulations on organization, operation and use of electronic mail and electronic portals at the Department of Education and Training, Education and Training Offices and educational institutions [26].
3	12/2016/TT-BGDĐT (2016)	Application of information technology in management and organization of online training [27].
4	21/2017/TT-BGDĐT (/2017)	applying information technology in Internet training and training activities for teachers, staff and education managers [24].
5	345/KH-BGDĐT (2017)	Strengthen the application of information technology in management and support of teaching - learning activities, scientific research, contributing to improving the quality of education and training in the period of 2016 - 2020, orientation to 2025 [22].
6	4095/BGDĐT-CNTT(2017)	Guidance on implementing IT tasks for the 2018-2019 school year [28].
7	3946/BGDĐT-CNTT (2018)	Guidance on the implementation of IT tasks for the 2019-2020 school year [29].
8	4966/BGDĐT-CNTT (2019)	Deploying the task of applying IT to higher education institutions, pedagogical colleges and pedagogical secondary schools [23].

It can be seen that, for nearly a decade, the MoET has been very active in issuing policies in accordance with the government's directions on building e-government, applying ICT in

management activities. At the same time, for the education sector, the MoET has issued 05 important documents (with 4 circulars and 1 plan) as a basis for guiding and implementing

ICT applications in the education system. The above documents focus on 2 main contents: i) on ICT infrastructure; and ii) Strengthening ICT application capacity for teachers and education managers.

3.3. Context for K-12 Education Reform in Vietnam

After 30 years of reform, Vietnam has overcome many difficulties, challenges, but also achieved great achievements of historical significance. Vietnam has escaped from underdevelopment, entering the group of middle-income developing countries. However, the economic achievements of our country are not stable, the quality of human resources and competitiveness of the economy is not high, the cultural environment still remains lots of limitations, not having enough factors for fast and sustainable development.

For the last 30 years, the world has seen profound changes in all aspects. The third and fourth consecutive industrial revolutions came into being; the thriving knowledge-based economy has given rise to tremendous growth opportunities, and poses no small challenge to every nation, especially in developing and underdeveloped countries. On the other hand, climate change, depletion of resources, environmental pollution, ecological imbalances and political and social turmoil have posed global challenges. In order to ensure sustainable development, many countries have continually renovated education to improve the quality of human resources, equip future generations with solid cultural backgrounds and high adaptability to all natural and social variables and dynamics. Education reform has become a pressing need and a global trend.

This is timely since the MoET in Vietnam has identified the development of textbooks in both the school and university sector as a key strategic priority associated with raising educational attainment and social well-being (2013, Resolution No 29/NQ-TW, Fundamental and Comprehensive Education Reform (FCER); 2015, MoET, NTEP; MoET, 2015, Enhancing

Teacher Education Program (ETEP) [30]. Although research shows that Vietnam has been slow to adopt personal mobile phone and tablet computers [31], this is changing rapidly and there is an urgent need to build the capacity and capability of staff in universities and schools in order to use these technologies effectively.

3.4. IT Infrastructure and Equipment

ICT opens up great prospects for innovating teaching methods. The constructivist approach of teaching, project-based teaching methods, teaching discoveries and problem solving have more and more conditions for wide application. Types of teaching such as classroom teaching, group teaching, and personal teaching also have innovations in the ICT environment. Application of ICT to innovate content, teaching methods and assessment is presented by the Ministry of Education and Training to schools. MoET has also invested in building shared databases (<http://elearning.moet.edu.vn> or <http://truonghocketnoi.edu.vn/>). Deploying ICT infrastructure and equipment has been focused on investment in Informatics (primary school has rate of 24 students/1 computer, secondary school has rate of 16 students/1 computer and high school 12 students/1 computer). All computer labs must be connected to the Internet.

DHT or Ebooks has not been specifically developed by the MOET or educational institutions. DHT or E book DHT targets one of the six 'solution areas' for The NTEP: 'to enhance the physical environment and facilities/equipment of teacher training institutions including IT facilities for distance and e-learning and supporting the development of e-libraries'. The proposal funded by Newton Institutional Links grants names "A Vietnam-UK Centre of Excellence to design, construct and research the pedagogical impact of mobile digital textbooks in education" has been carried out to meet one of its results. The sustainable centre of excellence in VNU, linked to partner academics and researchers in the UK, will ensure that teachers trained in these institutions

are more capable of using high quality digital resources to raise basic standards of education and offer wider, more democratic access to learning and international research. This will make a significant impact on the educational and social well-being of students, particularly those in vulnerable populations. It will allow a more personalised and democratic participation in learning for those who despite their growing access to personal digital technologies might be excluded from learning (the poor, the rural and isolated, those with special needs).

For education reform to succeed future students need access to such resources and future teachers must be upskilled in their development. Therefore teacher educators must be confident in both the construction of the DHT resource and the challenges that these make to pedagogy and the kinds of pedagogic action that they promote (blended, asynchronous, personalised, authentic, collaborative, distance learning). This project will seek to develop a clear understanding of the teaching competencies necessary for the teachers of the C21st who will utilise these DHTs. By ensuring the hub and its associated spoke (Danang University in this initial trial) is capable of developing its own customised DTH in the future, the project will also reduce the longer-term cost of access to learning resources for schools, teachers and students.

ICT today has penetrated and fundamentally changed the content, tools, methods, forms and labor efficiency. For education and training, ICT is profoundly changing the content, methods, forms of teaching and management of education. The application and strong development of ICT in education - training inevitably leads to the formation and application of DHT.

3.4. Capacity of Teachers to Apply IT in Teaching

The ICT skills of newly graduated teachers vary depending on the teacher training department. In Vietnam, it is possible to graduate as a teacher without being familiar with educational use of ICT and media skills. In

fact, educational institutions are well aware of the policy & plan to apply ICT in education “there are good plans and policies to enhance the application ICT in teaching. Pre-schools have developed their own plans”. Besides, “Pre-schools’ teachers training to improve the capacity of ICT is also focused,... However, teachers are facing still difficult, uneven in schools and is still fragmented, not a regular and popular activity of teachers” [32]. The 2016-2020 ICT suggested plan of Develop a system of teacher training via the Ministry of Education and Training network. The 2010 OECD/CERI “New Millennium Learners” report suggests that student teachers fail to obtain sufficient competence in educational use of ICT during their studies [33]. Graduate teachers also need additional skills in terms of business and network co-operation. In addition to newly graduated teachers, those already working at schools require continuous and diverse training [34].

4. Recommendations and Policy Review

ICT has been promoted in the field of education reform as a subject as well as an important tool to innovate teaching activities. In order to develop the knowledge economy and global integration, Vietnamese policy makers have made great efforts for the cause of educational innovation, first of all, issuing policies related to ICT application to meet the needs of global knowledge society on qualified human resources. Vietnam promotes training in ICT skills and builds ICT infrastructure to quickly implement the country's industrialization and modernization. In the context of globalization and the flat world, the role of ICT is to support the process of education reform to create an innovative, fair-learning society. Policies issued by MOET to 63 DOET encourage teachers to apply ICT to teaching. E-learning and development, use of E books or DHT are targeted as the final result of the application of ICT in education. However, there is no clear definition of e book or DHT given.

Analysis of the implementation of policies related to ICT application in educational institutions shows that the government has made efforts to provide orientations for ICT to be applied extensively from management to teaching activities. The Ministry of Education and Training also issued specific circulars and guidelines to timely implement orientations from the government. However, the approach to applying ICT in education has many multi-dimensional and too wide theoretical bases. Macro-level policies do not have specific action plans for educational institutions. Moreover, for ICT infrastructure and equipment improvement, there is a need for appropriate investment from the government or development funds, including socialization. The ICT guidelines are too sketchy and are not really specific on how ICT will be applied in teaching and learning or what teachers need to know and trust [35]. In fact, it is difficult to establish change in methods and it is difficult to assess what changes are taking place. The application of ICT in teaching is required in a process. Teachers often face different barriers, they need to take some steps from improving ICT access to improving basic and advanced IT skills, teachers have to reflect on the possibilities of applying ICT for teaching & studying [36].

IT infrastructure and equipments are always emphasized by the Ministry of Education and Training in the ICT development plans and projects in the education system. Specific action plan for each stage (5 years, each year) is required. This plan should be associated with a system of specific indicators. Every year, it is necessary to conduct review and publication of results of assessment of ICT application in schools. Schools should have high-quality, compatible and cost-efficient technical solutions.

The ICT purchasing process should be carried out as an overall process involving users and service providers [37]. In addition to infrastructures and tools, all schools need easily available technical and pedagogical support.

Educational institutions are looking forward to an active ICT role in innovating teaching methods and towards education reform. The

phrase “applying ICT in innovating teaching methods” is much mentioned in the school year reports as well as the school year plans, but there seems to be no specific idea for ICT application in teaching process, in each subject. Website: <http://truonghocketnoi.edu.vn/> page is an open forum for all teachers and students to use open learning resources. Materials on this page are lectures designed by teachers (pptx) and uploaded. The students still mainly use traditional textbooks.

There has been a circular guiding training for teachers to apply ICT in teaching. However, capacity building for teachers is also needed so that they can develop interactive learning scenarios for e-textbooks to improve student learning and awareness. These individual portable digital devices can be used as e-book readers to support mobile personalized learning. Though many studies have investigated e-books by targeting undergraduate students, yet less attention has been paid to children [38]. With the advantages of E book/DHT, content with multi-media materials (photos, videos, audio, 3D models, tables and vivid graphs) will bring much more efficiency in acquiring knowledge, students not only hear, see, watch (movies, pronunciation, music, etc.) but also interact (practice experiments, do exercises, play intellectual games,...). Students are more interested in learning and are more aware of early access to new technology, increasing their ability to self-study and self-study.

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