



## STATUS OF USING IT IN TEACHING: OPINIONS OF MATHEMATICS TEACHERS OF HAU GIANG PROVINCE, VIETNAM

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### **Abstract:**

Application of information technology to education with the purpose of contributing to improving the quality of education and teaching in general and in teaching mathematics, in particular, is a trend of the world. In Vietnam, this trend has been implemented in high schools for many years. To find out about the status of facilities and teaching related to using information technology (IT) of mathematics teachers in schools in Hau Giang province - Vietnam, we conducted a survey of 71 mathematics teachers by 5 - point Likert scale questionnaire. The survey contents were (1) Current status of facilities for teaching and applying IT; (2) The frequency of using IT in teaching high school mathematics; (3) The software used in teaching mathematics; (4) The learning attitude of students when teachers apply IT in teaching and learning; (5) Students' ability to absorb knowledge in lessons with the support of IT. The results showed that in some schools, facilities for using IT were inadequate; teachers sometimes or rarely applied IT in their teaching. However, most of the mathematics teachers asserted that teaching with IT increased motivation and performance of students. The report has partly reflected the practical situation of this approach to educational technology in Hau Giang province in particular and in Vietnam in common.

**Keywords:** educational technology, IT and teaching, ICT, mathematics software, secondary education, mathematics education

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## 1. Introduction

Educational technology has been developed and widely applied in many countries around the world. Different types of research on training, teaching and learning were carried out, and those results proved powerful effects of using IT in teaching and training. The study of Mrinal Mukherjee and Chanchal Maity (India) showed that teachers after learning how to use IT in their teaching and learning job had positive attitude towards using IT as an educational tool; however, the application of IT resources in classroom was a big problem to them, they need to take an advanced course of how to integrate IT in instruction. Suparman, Iwan Hartadi Tri Untoro, Anggit Prabowo, Andriyani (2019) asserted the low ability of teachers in the field of IT is one of the reasons why teachers do not make use of IT as a tool to design suitable lessons of mathematics in schools; after taking training program on using IT in teaching mathematics, the ability of these teachers in using IT into teaching mathematics was improved.

Heriberto González Valencia, Astrid Ramirez Valencia, Jakeline Amparo Villota Enriquez integrated IT in teaching language; the results were to enhance participants' motivation and performance. In Vietnam, the Government encouraged to do research and use IT in teaching. In terms of research, Vietnamese mathematics researchers and teachers conducted works related to the use of mathematical software in teaching mathematics in schools such as Loc [6], Loc & Triet. ([4], [5]), Loc & Tuan [8], Loc & Phuong [7], Loc & Nam [9], Phan Trong Hai [13], Huong [11] ....As for training, mathematics teachers in many provinces of Vietnam were also trained for using IT and mathematical software into teaching mathematics.

Particularly, Hau Giang province is a poor province of Vietnam; ICT facilities of provincial schools are generally inadequate. However, the Department of Education has paid close attention to access educational technology into teaching practices; mathematics teachers learned some mathematical software through classes taught directly by IT experts.

In such circumstances, the question is: what are the provincial math teachers' opinions on the status of facilities and approaches to educational technology in the teaching process? This is the question that our survey was conducted to provide the answer.

## 2. Theoretical background

### 2.1. Information technology and innovation of teaching methods in high schools

#### A. What is information technology?

IT is an engineering branch that uses computers and computer software to convert, store, protect, process, transmit and collect information. In Vietnam, IT is understood and defined in the Government's Resolution No. 49 / CP, signed on August 4, 1993: *"Information technology is a collection of scientific methods, means, modern technical tools - mainly computer and telecommunication techniques - to organize the efficient exploitation and*

*use of rich and potential information resources in all areas of human activity and society. IT is developed on the basis of development of technologies of electronics, informatics, telecommunications and automation” [14].*

### **B. Teaching and Learning by using IT**

From the above point of view on IT, learning is an information-driven process of information acquisition, reproduction and development; teaching is to distribute information and help learners carry out the above process effectively [10]. Thanks to multimedia tools of computers such as text, graphics, images, sound, animation, teachers can design lively lectures to attract learners, easily apply pedagogical methods: case-based teaching method, problem - posed method, comprehensive assessment and evaluation of learning to make students more active in teaching and learning process[15]. Therefore, IT has changed the centre position of the teacher; now, he plays the role of a coordinator in student-centred teaching activities. Today, IT used in education has the role of promoting, coordinating thinking and building knowledge through the following actions:

- Supporting students to build knowledge and skills;
- Creating an environment to support hands-on learning, community exchange, and reflection;
- Assessing and evaluating learning outcomes.

### **C. Benefits of applying IT in teaching**

For teachers, the application of IT in teaching helps teachers improve creativity and become more flexible in their teaching process. Specifically, teachers are not only limited to existing knowledge but also learn more about other subjects such as informatics, foreign languages and learn skills to use images and sound in designing a lesson plan. In addition, applying IT in teaching helps teachers to share lectures with colleagues, discuss and improve their lesson plans together [16].

For students, they access a new teaching method which is more attractive than the traditional reading and writing methods. In addition, the interaction between teachers and students is much improved; students have many opportunities to express their own views and opinions. This not only helps them more confident but also allows teachers to understand more about students' abilities, character and level of knowledge acquisition of them, thereby making appropriate and scientific adjustments. [16]. Moreover, the high exposure to IT in the classroom also gives students the necessary computer skills right from the time they are sitting on the school chair. This will be the foundation and practical support to help students diversify and create presentations before class, enhance the ability to find information for their lessons. [16].

For society, for a long time, the application of IT in teaching has been implemented in many developed countries. Currently, in Vietnam, although the period of using technology in teaching in schools is quite short, the benefits of that have been clearly shown. The teaching quality of teachers has been improved; teaching methods have been

changed in a positive way. It is argued that in the near future, Vietnamese education will keep up with the educational development of many countries in the world [16]. Obviously, such improvements will not only benefit learners and teachers but also have a significant meaning for the development of both the community and the country. As young educators in the future, students of pedagogy should now start learning about how to apply IT in teaching to turn their future classes into engaging, fun and rewarding playgrounds.

## **2.2. Using IT in teaching mathematics**

The fast-growing Industrial Revolution 4.0 has created favourable conditions for applying IT to teaching in general in the field of mathematics in particular. According to [12], D. T. Hai described 6 basic directions in using IT and communication to provide conditions for math learners, namely:

- Reverse-based learning: Computers are able to provide fast and accurate feedback from an objective perspective. From such feedback allows learners to make their own guess, and from there, they can experiment and change their ideas.
- Observing models: With the ability and processing speed of computers, learners give many examples when exploring problems in mathematics. Computers will help learners to observe and process models, thereby providing proof in the general case.
- Detecting relationships in mathematics: Computer allows to graphically process observation of changes in the correct way and linking them together. The modification of some components and the remaining components help the learner to discover the correlation between quantities.
- Operating with animations (dynamic images): Learners can use the computer to display graphs vividly. It helped learners visualize geometric figures in general from computer images.
- Information mining: Computer allows users to work directly with real data, thereby visualizing its diversity and using it to analyze or clarify a mathematical problem.
- Teaching with computers: When learners design algorithms to use the computer to find results, learners must complete a sequence of instruction clearly and accurately. They have arranged their thoughts and ideas clearly.
- Using graphics with computers: Graphs on computers are new in mathematics classes; in the case of using graphics with a computer, users can easily change the size of them.

## **3. The survey of the teachers' opinions on the current status of education technology**

### **3.1. Purpose of the survey**

The purpose of the survey was to find out the following contents (in Hau Giang province, Vietnam):

- 1) Current status of facilities for teaching and applying IT;
- 2) The frequency of using IT in teaching high school mathematics;
- 3) The software used in teaching mathematics;
- 4) The learning attitude of students when teachers apply IT in teaching and learning;
- 5) Students' ability to absorb knowledge in lessons with the support of IT.

### 3.2. Survey method

The Survey by using a 5-point Likert scale questionnaire with questions of 5 the above contents (presented in 3.1).

### 3.3. Implementing the survey

The survey time: the survey was carried out in the academic year 2018 - 2019.

Survey respondents: 71 Mathematics teachers at 7 high schools in Hau Giang Province (see Table 1)

**Table 1:** The number of surveyed teachers of high schools in Hau Giang province

High School	The number of teachers
Vị Thủy	7
Lê Hồng Phong	6
Chuyên Vị Thanh	14
Vị Thanh	15
Long Mỹ	19
Lương Tâm	5
Vĩnh Tường	5
<b>Total</b>	<b>71</b>

### 3.4. The survey results and discussion

#### A. Current status of facilities for teaching and applying IT

**Table 2:** The convenient level of facilities for teaching and applying IT

Very convenient	Convenient	Normal	Inconvenient	Very inconvenient
3 (4.22%)	23 (23.39%)	12 (16.90%)	33 (46.47%)	0 (0.00%)

Through Table 2, we see a relatively high percentage of teachers (46.47%) who think that the current facilities are not convenient for using information technology in teaching. Only (23.39%) thought that the necessary equipment for teaching with information technology was convenient. The above figures reflect current reality in schools in Hau Giang province. Some schools, due to the Board of Directors' interest, invest in purchasing much equipment for teaching; however, some schools, especially those in remote areas of Hau Giang province, often have inadequate technical facilities; therefore, it makes it difficult for teachers to use information technology in their teaching.

## B. The frequency of using IT in teaching high school mathematics

**Table 3.** How often to use IT in teaching high school mathematics

Very frequently	Frequently	Sometimes	Rarely	Very rarely
2 (2.81%)	15 (21.12%)	32 (45.07%)	22 (30.98%)	0 (0%)

The use of communication technology in general, the use of mathematical software in teaching aids will depend on many factors, such as technology interest of teachers, IT skills, level of use proficiency in software, etc. Therefore, Table 3 shows that only 21.12% of teachers regularly use; as many as 45.07% occasionally used, 30.98% rarely used. Another equally important thing that affects the use of IT in teaching is that teachers invest a lot of time to have an excellent teaching hour.

## C. The software used in teaching mathematics

**Table 4:** The software used in teaching mathematics in schools of Hau Giang

Cabri 2D, 2D (1)	GeoGebra (2)	Geometer's Sketchpad (3)	Geospace-Geoplane (4)	Other software
21 (29.57%)	6 (8.45%)	45 (63.38%)	13 (18.30%)	9 (12.67%)

Over the past ten years, the general math teacher in Hau Giang province has been trained by dynamic experts to use dynamic mathematical software such as Cabri 2D and 3D; Geometer's Sketchpad, GeoSpace and GeoPlane. Therefore, according to Table 5, the number of teachers using the mentioned software accounts for a very high proportion; especially Geometer's Sketchpad (63.38%), Cabri 2D, 3D (29.57%), all three software are expensive to buy and use. One thing noted in Table 4 is that GeoGebra is beneficial software, it is dynamic math software such as (1), (2), (3) but it is multi-function software, can be used for teaching Plane Geometry, Space Geometry, Algebra, Calculus. Moreover, GeoGebra is open source software, free software; but very few teachers use it (8.45%). This can be explained as follows: - Teachers have not been trained to use this software; - Only self-studying teachers or young teachers graduated from universities, such as Can Tho University, where this software is taught in training programs.

## D. The students' attitude towards teaching and learning with IT

**Table 5:** The attitude of students towards learning and teaching with IT

Very interested	Somewhat interested	Normal	Not very interested	Not interested at all
1 (1.40%)	34 (47.88%)	32 (45.07%)	4 (5.63%)	0 (0.00%)

As shown in Table 5, we see that nearly 50% of teachers believe that students prefer to study IT-intensive lessons. And almost very few students do not like (5.63%). In order to get the above results, because teachers already know how to take advantage of information technology to make lessons more vivid and attractive such as:

- Information technology has many different functions; teachers can apply it to design games, quizzes to learn and display images of the surrounding world related to the lesson content. Thereby, students know the practical meaning of mathematical knowledge, mathematics close to real life, architectural works, natural phenomena that often take place according to mathematical rules.
- Teachers have learned to exploit images related to mathematicians, historical factors related to mathematics in high schools through the Internet; thereby not only creating interest in learning mathematics for students but also creating motivation for learning and passion for science.

### E. Students' ability to absorb lessons in lessons with the support of IT

**Table 6:** How well students learning with the help of IT

Very well	Well	Normal	Badly	Very badly
1 (1.40%)	33 (46.47%)	30 (42.25%)	4 (5.63%)	3 (4.22%)

The data in Table 6 indicates that very few teachers (10%) think that using information technology in teaching makes students acquire inadequate knowledge. On the contrary, most teachers believe that thanks to the support of information technology, students learn lessons better. Clearly, nowadays, with the advancement of information technology, and especially in the past 10 years, there is some mathematical software that supports the teaching process of mathematics in high schools very well. For example, such as Geometer's Sketchpad, Cabri 2D and 3D, GeoGebra has many features that can effectively support the effective teaching of mathematical knowledge in schools but also support for solving math problems. Practice in high school shows that the lessons of math teachers with the support of dynamic math software have proved the positive effects mentioned above.

### 4. Conclusion

The application of information technology to teaching in general and teaching Maths, in particular, depends on many different factors. According to the survey, the equipment used for teaching with IT in high schools, in the opinion of many teachers, is not very convenient; this is one of the reasons that many teachers sometimes or rarely does IT lessons. One thing we recognize for continued research to help teachers apply IT to teaching is that students are more interested and learn better lessons in IT-assisted lessons. Therefore, it is necessary to promote teachers to integrate IT into teaching, and the government and education departments need to invest in IT equipment and organize

advanced training courses on educational technology, helping teachers continue their education, access to IT achievements, feature-rich software and utilities so they can take advantage of IT as a critical pedagogical measure to improve the quality of education and teaching in high schools.

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