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# Utilization Of Information And Communication Technology In Learning At Gajah Mada High School

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## Abstract

One way to spread information and messages is through educational media. Effectively crafted educational materials greatly aid pupils in assimilation and comprehension of the material. The advancement of learning media has been fueled by the growth of information technology in today's globalized and information-rich environment. There is already a desire for using information and communication technology (ICT) as a learning tool. Even while ICT-based media design calls for specialized knowledge, this does not mean that the medium is shunned or ignored. ICT-based learning resources include mobile phones, CD rooms/flash drives, intranets, and the internet. To adapt to increasingly rapid changes caused by technological advances, learning patterns must be changed. A qualitative approach with a descriptive model was used in this research to analyze and explain how information and communication technology is used in learning at Gajah Mada High School. According to research conducted, the teacher's paradigm in using information and communication technology in learning is still limited to the use of ICT-based computer media as presentation material in the learning process. The use of the internet to search for information about subject matter is still limited, and social networks are still not included as a new learning system. The use of technology as a way to learn in the teaching and learning process can help teachers communicate and interact with their students both in the classroom and outside the classroom. Technology in education is nothing new; has proven to be very important to make students innovative and fun.

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## 1. Introduction

Human needs for information technology and communication continue to increase, including in the field of education. The symbol "e" which means electronics, has begun to be widely used and is used in almost all fields. E-learning, e-government, and e-learning are examples. The role of teachers in using technology information and communication better is very important to provide a better idea to the younger generation about how to use technology in a better way.

Entering the Information and Communication Age (ICT), the use of information and communication technology (ICT) is very important for the educational process. We can improve the quality of education by using ICT to expand access to knowledge and provide high-quality education. Information and Communication Technology enables the broad, fast, efficient and effective dissemination of information throughout the world. The development of information technology is in line with the development of theory and communication, both of which help the learning process. Learning is the most important activity in the educational process. The more humans develop, the more science and technology develops in all fields, which results in increasing educational costs. On the other hand, the development of humanity encourages more people to move forward and not want to be left behind. And they all need improved education. As a result, quality and quantity education factors cannot be ignored. Education must be provided in a quality and fair manner for all people. As a result, education becomes increasingly expensive because it has to meet quality and also because it has to meet quantity.

How the learning process is carried out and designed by professionals greatly influences the achievement of educational goals. Every learning activity involves two active actors: educators and students. Educators create a systematic, continuous, learning environment for students. Students, as students, enjoy the learning environment that educators create. In other words, teacher education and development is very important for the successful implementation of an ICT-based curriculum.

It cannot be denied that technological advances are increasingly pampering humans, especially in terms of communication. With the help of technology, interaction becomes easier and more varied. The technologies in question include websites, blogs, microblogging, e-mail (e-mail), Yahoo Messenger (YM), Google Talk (Gtalk), and what is currently very popular is social networking. In this modern era, technology is increasingly advanced and sophisticated, such as information technology. Here, I want to share an essay or review about information technology in the field of education, because this technology helps learning, makes learning easier, and makes knowledge broader and more practical.

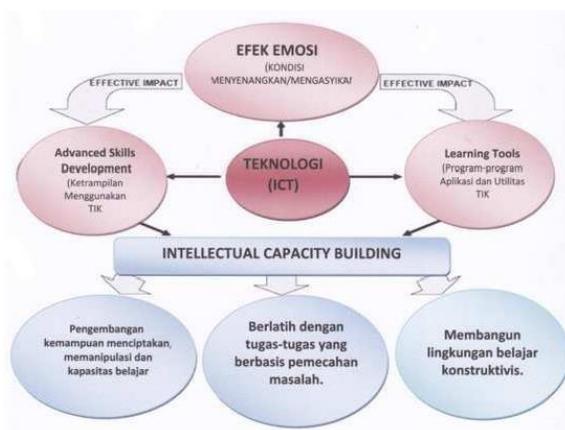


Fig. 1 Technology Integration Model in Learning

The three functions performed by technology (ICT) are as follows:

1. Provide a fun and exciting learning environment (emotional effect)
2. Providing expertise through the use of high technology This addresses the problem of relevance to the external world.
3. Serves as a learning tool through application and utility programs that expand the variety and techniques of analysis, interpretation, etc., and also speed up and simplify work.

Students can increase their intellectual capacity through positive emotions, skills in using technology, and the ability to utilize such programs and utilities. They can also develop their abilities to create, manipulate, and learn; practice with problem-solving based tasks; and building a constructivist learning environment. According to Thomas C. Reeves, there are two main approaches to using technology to assist learning in schools: students can learn "from" technology and learn "with" technology. Learning "from" technology

includes using technology as a cognitive learning aid (cognitive learning aids) and using an integrated learning system.

### **1.1 Methods of learning "from" technology**

1. Based on standards for achieving learning outcomes, the use of computers as tutors (computer-based learning) improves learning outcomes and motivates students to learn. Teachers accept it more than any other learning method, parents, politicians, and society generally support it.
2. Students can complete learning objectives in a shorter time than without using CBI.
3. Integrated learning systems are an effective format of CBI, and may play a greater role in the future.

### **1.2 Learning methods that use technology**

1. As learning aids, cognitive tools will be most effectively used in a constructivist learning environment.
2. Cognitive tools give learners the opportunity to design their own way of understanding knowledge rather than absorbing knowledge from ready-made ways (designed by others).
3. Cognitive tools can also be used to support meaningful learning processes.
4. Additionally, cognitive tools can be used to support meaningful learning processes.
5. Tasks or learning problems that use cognitive tools must come from students, with the guidance of teachers, or other people.
6. Ideally, tasks or problems used with cognitive tools should be set in a realistic context and produce significant results for the learner.
7. Using multimedia construction programs as a cognitive tool will help learners develop a variety of skills, including project management skills, organizational and presentation skills, reflection skills, and research skills.
8. From research conducted regarding the cognitive effects of using cognitive tools on students

Any technology that helps humans create, change, store, communicate, and/or disseminate information is called information technology (IT). The general term for this technology is information technology (IT). Computers, TVs, household appliances, and modern handheld devices, such as cell phones, are examples of information technology.

### **1.2 Utilization of IT and Communication in Education**

In the world of education, technology-based learning models have emerged with many terms used, such as: Cybernetic Learning Environment (CLE), Desktop Video Conferencing, Integrated Learning System (ILS), Learner-Centred Classroom (LCC), Teleconferencing, Computer Based Education (CBE), ICT, Computer Based Training (CBT), Computer Based Instruction (CBI), Distance Learning, Distance Education, Cybernetic Learning Environment (CLE), dan lain-lain. Semua istilah tersebut pada intinya sama, yakni mengacu kepada sistem pembelajaran yang mengandalkan pemanfaatan teknologi.

Degeng (2004) looks at the quality of learning from two aspects, namely the process and learning outcomes. Meanwhile, efforts to improve the quality of the learning process lead to the emergence of initiatives from both students and teaching staff.

In connection with the learning process as stated by Degeng (2004), Miarso (2004) said that the factors that influence or support the realization of a quality learning process in an effort to achieve educational goals, one of which is the use or use of information and communication technology in education and learning process. ICT in learning is known as educational technology, UNESCO officially uses the term ICT which was later adopted into Indonesian as information and communication technology or ICT (Surjono, 2010)

According to Haag and Keen (1996), information technology is a set of tools that help you work with information and perform tasks related to information processing.

Martin (1999) said that information technology is not only limited to computer technology (hardware, software) used to process and store information, but also includes communication technology to transmit information.

Turban et al., (2002) define information technology as a way to describe a number of information systems, users and management for the benefit of organizations.

Information Technology is a technology that combines computing (computers) with high-speed communication lines that carry data, voice and video (Williams and Sawyer 2003).

To improve the conventional learning system which is considered outdated and irrelevant to the dynamics of developments in an increasingly rapid and intensive era triggered by developments in science and technology, changes in learning patterns are very important. In the learning process, information and communication technology functions as a link to carry out knowledge transfer. This does not eliminate the initial learning model which takes place face to face in class.

In the learning process, the use of information and communication technology is carried out to increase the effectiveness of the learning process. In the end, it is hoped that the use of this technology will improve student learning outcomes and the individual quality of students through the use of more appropriate and useful technology.

Based on what has been said, the author wants to conduct further research on the use of IT and communication in learning at Gajah Mada High School. This is due to the fact that researchers found that many teachers still do not use IT and communication in the learning process.

## **2. Research Methods**

Using qualitative methodology, this research investigates the use of IT and communication in learning at Gajah Mada High School. This study also investigates factors that support and hinder the use of IT and communication in learning,

Qualitative Research is a method used to research the condition of natural objects. Descriptive methods are used in qualitative approaches in research to match empirical facts with relevant theories (Sugiyono, 2009; Moleong, 2013).

Information is defined as individuals who are considered by researchers to be able to provide descriptions, stories and details not only about themselves, but also about other people, situations and conditions that are the subject of research. Hadidi (2010) This research involved female students, school principals, deputy principal for curriculum, and deputy principal for infrastructure from Gajah Mada High School.

This research emphasizes and explains two questions: what is ICT? and how does ICT function in education? and What is the role of information technology in increasing the professionalism of teachers and educators. The aim of the research is to explain the meaning of information technology, understand the role of information technology in the world of education, and find out how information technology contributes to improving the quality of education.

## **3. Result and Discussion**

Use of ICT in Learning :

Information and Communication Technology (ICT), or better known as information and communication technology (ICT), has developed rapidly and influenced many fields. According to Bambang Warsita (2006), there is a third wave in the advancement of information and communication technology (ICT). The first wave involved agricultural technology, and the second wave involved industrial technology. The current third wave is characterized by rapid advances in information technology and electronics.

Currently, the world of education is starting to use technology in many things, including learning. Education policy focuses on the use of communication and information technology to prepare human resources capable of facing challenges throughout the world.

At a minimum, educators must have the skills and desire to use information and communication technology in the learning process. In Permendiknas No. 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies, the pedagogical competency section for high school teachers states that utilizing information and communication technology in the learning process is a subject teacher competency. This shows that learning is no longer conventional. It is hoped that the use of information and communication technology by teachers will increase the success of the teaching and learning process. They are expected to be

able to use it to apply various innovative learning approaches, strategies, methods and techniques to the subjects they teach.

The appropriate application of information and communication technology in education is an important part of improving the quality of education and human resources. The application and development of information and communication technology is a strategic action to improve access and quality of education. This is also an important factor in improving the quality of education (Munir, 2009).

In this research, the model for using information and communication technology (ICT) in the learning process is based on Munadi (2013), who divides the use of computers in learning into several types, including multimedia presentations. Next, he discussed the use of the internet in learning, which includes the use of e-mail and websites.

Computers can also be used as tools for playing games, which of course are learning games. This is intended to prevent students from getting bored so that teachers can achieve what they expect.

By using presentation media, teachers and students can present the learning material and assignments that have been given. Teachers no longer need to write about the material presented on the blackboard, and students can spend more time talking and discussing.

Based on the data collected during the research, it can be concluded that the majority of teachers at Gajah Mada High School have not used e-mail, websites and blogs as learning systems, communication tools, or to support learning interests such as assignments. It is a shame that internet use is only limited to browsing to find additional information or search for other information. This does not make sense considering that the internet, including websites, blogs, and e-mail, can be used as a new learning strategy that allows students to learn from anywhere and at any time while still being guided by the material taught in class.

The internet as a teaching medium can have several unique characteristics, according to Purnomo (2008): 1) as a mass and interpersonal medium; 2) interactive; and 3) allows direct and indirect communication. Compared to just using conventional media in the classroom, internet features allow students to communicate with more sources of knowledge.

According to Sudarma (2008), in one of his books, information technology and the internet have entered everyday life, including education, and the use of the internet in learning at Gajah Mada High School is not compatible. This statement shows that in the era of openness, the internet has become an important part of people's daily activities, especially for students and university students.

It is hoped that educators can use the internet as a new learning system tool, not just use it as a learning resource by simply looking for supporting material.

In one of her books, Warsita (2008) said that internet and information technology users have increased in extraordinary numbers, and have even become an important part of household life and educational institutions. This phenomenon shows that in the coming years, information technology will dominate student learning patterns.

By using the internet, teachers can further optimize face-to-face learning in class for things that are more useful than just providing material in simple written form and sharing it with students via websites, blogs or e-mail. According to Murni (2008), the internet is a global network that connects thousands or even millions of personal computer networks throughout the world. Therefore, every computer connected to the internet has the ability to contact various computers from anywhere on the planet for the purpose of sending news, obtaining information, or sending data.

In his book, Munidi (2013) states that the internet greatly influences the learning process and outcomes both inside and outside the classroom. By using the internet, learning can be done faster, richer, broader, more effective and more productive.

It is hoped that the use of the internet in education can encourage students to learn independently and sustainably by using their natural abilities and potential. By making the internet a new learning system, there are many opportunities for student creativity and independence. The use of the internet as an educational method is quite beneficial in reducing the distance between educators and students. With e-mail, teachers can convey messages to students without being limited by time and place, students can also consult at any time and from anywhere.

By using the website, students can act as researchers and analysts, analyzing various data. However, students are expected to be able to communicate with teachers and other students via e-mail. As well as other online communities to share information about the subjects studied. It is hoped that the use of e-mail and websites or blogs in learning can reduce space and time limitations.

Many teachers have not tried using social networks as an alternative learning method. As a result, the use of social networks as a learning system still lacks attention from educators. Social networking sites known to students can be used as learning tools to replace learning system management software. Social networking sites have advantages over learning system management software because they can be used without having to rent or manage a server, and most importantly, they are more familiar to students.

Social friendship sites such as Facebook, Twitter, and MySpace have become popular and seem to be needed by everyone. Educators and students also use Facebook every day, and various communities are also starting to become visible.

Social networking sites can actually be used as a new alternative in the world of learning in an effort to increase student learning motivation. Ultimately, this is expected to significantly improve student learning outcomes. Since most students, teachers, and the general public already have social networking accounts, these accounts should be put to good use to help students learn and provide more variety in learning.

Many students log into their social networking accounts more than once a day. Students often forget to spend time on social networking sites, which diverts time that should be used for studying or other more productive activities. While social networks are very popular and interesting for students, they make it easier to use them because they can be accessed from anywhere, even from their own mobile phones.

Leveraging social networks to interact more intimately with their students allows teachers to be good directors and supervisors of their students both inside and outside of school. An educator must be observant to see existing developments.

Examples of social networking platforms Currently, Facebook is the most commonly used platform, and teachers have the ability to form groups. In this group there are students or classes who study the subjects being taught. Teachers can upload lesson materials to their groups by uploading files such as pdf, word, or PowerPoint or other file types. That way, students can download material files wherever and whenever they need them.

Regarding communication, by utilizing existing group facilities, students can also ask the teacher directly about material they do not understand, as well as other group participants can also listen to the questions interactively. This is the same as when an instructor teaches in class.

In an article written by Patria and Kristianus (2010), they explain the many benefits offered by social networks which can be used by users to facilitate interaction between fellow users. These features can also be used as learning media to support the effectiveness and efficiency of the learning process.

#### Factors Inhibiting the Use of ICT in Learning:

The results of research carried out through several stages show several things that hinder the use of information and communication technology in learning, namely:

1. The problem of unstable internet networks really disrupts the preparation of various study field teachers for learning using information and communication technology, even though wired facilities are available throughout school area.
2. Another challenge that teachers face when using ICT at Gajah Mada High School is that they feel burdened to use instructional media to teach. This is because teaching media requires teachers to be more creative and prepare teaching better. Before using media, teachers should try it to become familiar with it. Once the class gets used to it and is no longer awkward, the teacher needs to prepare more time and energy to make good use of learning media.
3. Limited operational personnel to use ICT: not every teacher is able to operate this media, so special personnel are needed to manage it. This limited operational staff will also make it difficult to handle scheduling, maintenance and operations when teachers use ICT.
4. Lack of teacher ability to utilize various ICT facilities provided by the school. This is sometimes influenced by the competency factors of the teacher concerned, such as age. Older teachers may find it difficult to keep up

with the rapid development of information and communication technology, which ultimately makes them overwhelmed in utilizing ICT facilities to support lesson material. A teacher must be truly able to use information and communication technology when teaching. To improve learning processes and outcomes, this must continue to be done. In turn, this will result in an increase in the quality of education for both teaching staff and students as a result of the educational process.

5. Financing issues The implementation of IT and communication-based learning has a significant impact on improving the learning process of teachers in schools. This is closely related to the fulfillment of IT and communication-based learning tools that support increasing teacher professionalism in the application of IT and communication.

Among the various challenges that the author has encountered, it can be said that the most prominent challenge is related to the teacher's ability to use information and communication technology in learning. Another problem found by the author is technical and financing problems.

Information and communication technology (LTIC)-based learning processes refer to the use of advanced technology to improve the quality and effectiveness of the learning process. In the end, it is hoped that this will be a special attraction for students.

Teachers play a very important role in the educational process, so it is important for today's teachers to understand the knowledge, skills and mastery of information and communication technology to support the learning process.

Minister of National Education Regulation Number 16 of 2007 concerning Academic Qualification Standards and Teacher Competencies determines the use of information and communication technology in education. This Permendiknas is divided into three categories: 1) utilizing information and communication technology in communication; 2) utilize information and communication technology in education; and 3) utilizing information and communication technology in teaching.

In order to make the nation's life more intelligent, National Education is intended to improve abilities and form a dignified national character and civilization. According to Law Number 20 of 2003, the aim of national education is to form individuals who have faith and devotion to God Almighty, have noble character, are knowledgeable, creative, independent and responsible. To fulfill their duties and responsibilities in carrying out the mandate of national education goals, teachers must have the ability, professionalism and creativity. This includes using technology to help students learn.

Based on PP No.74 of 2008 concerning teachers, teacher professionalism consists of four competencies: pedagogical, personality, social and professional. The teacher's ability to use a variety of resources to help is a professional learning competency, which includes the ability to use both information and communication technology as time goes by.

Information and communication technology offers many new opportunities, so teacher creativity is very important to take advantage of these opportunities. Without teacher creativity, sophisticated technology will not be successful.

A teacher still plays an important role as a content developer and learning tutor, no matter how sophisticated the technology is used to support the learning process. Because the role of the teacher cannot be replaced, teachers must be creative when using technology in learning. A teacher or educational staff needs a better understanding of how to utilize modern technology to make the transfer of material interesting and fun. Ultimately, this can increase students' focus and enthusiasm for learning.

Supporting Factors for ICT Utilization:

Facilities and infrastructure are very important in the world of education to support the achievement of educational goals, especially those related to the use of information and communication technology in learning. For educational success, facilities and infrastructure must also continue to be developed. In the modern era, schools must have projectors and internet access. Infrastructure, which is an important component of educational resources, must continue to keep pace with increasingly rapid developments.

Table 1. Completeness of learning facilities & infrastructure (theory and practice space)

No	Equipment Type	Quantity
1	Desktop Computer	Needs adapted to the needs of students, teachers and classes
2	Notebook/Laptop (Teacher)	
3	Internet access	
4	Lan/school internet network (wifi)	
5	Projector	
6	Digital camera	
7	Television/LCD/LED	
8	Computer & Multimedia Laboratory	
9	CCTV Camera (Indoor & Outdoor)	

#### Efforts to Increase the Use of ICT in Learning:

Using information and communication technology in learning programs will certainly provide challenges for schools to maximize its use.

In continuous efforts to improve the professional competence of teaching staff, there has been an increase in learning materials that are taught in a more innovative manner. This means that teachers must keep abreast of technological advances.

The results of this research provide an understanding of the various actions taken by Gajah Mada High School to maximize the use of information and communication technology in the learning process, including:

1. Schools carry out various programs and strategies to improve ICT-based facilities and infrastructure. For example, schools install LCDs in all classrooms, increase bandwidth for internet access, and purchase other ICT equipment. distributing laptops to teachers who do not have personal laptops.
2. School success encourages teachers to use information and communication technology. This is caused by the rapid development of information and communication technology today. This development makes teachers not only the only source of learning, but also allows students to use the internet network to search for information independently.
3. Providing seminars and training on how to use information and communication technology (ICT) in the learning process, both independently and organized by other parties.

#### 4. Conclusions

The research results show several things about the use of IT and communication in learning at Gajah Mada High School:

1. Not all teachers at Gajah Mada High School use information and communication technology in learning. Teachers who use information and communication technology in learning are still limited to presentations, especially PowerPoint. Internet access is still limited for searching for additional information about topics to be taught and has not been used as a new learning tool that is integrated with existing learning. In addition, social networks are still not used well as learning tools.
2. Teacher professionalism is still the main problem that hinders the use of information and communication technology in learning. This is related to technical problems such as financing and electricity problems as well as internet connectivity problems.

The availability of various IT and communication-based facilities and infrastructure is the main supporting component sufficient to enable the use of information and communication technology in learning.

3. The form of effort made by the school in order to optimize the use of information and communication technology in learning is by providing personal motivation to teachers regarding the use of information and communication technology in learning as well as various training and workshops both organized by the school independently and by parties outside the school.

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