International Journal of Educational Review

Publishes original research both theory and practices in Educational Management; Social Studies Education; Educational Technolgy; Natural Science Education; Guidance and Counseling; Primary Education; Linguistics Education; Early Chilhood Education; and Mathematics Education

E-ISSN 2685-709X P-ISSN 2685-905X
Volume 1, Issue 2, July-December 2019

Study Program Doctor of Education
Faculty of Teacher Training and Education, Universitas Bengkulu

International Journal of Educational Review

E-ISSN 2685-709X P-ISSN 2685-905X
Volume 1, Issue 2, July-December 2019

Publishes original research both theory and practices in Educational Management; Social Studies Education; Educational Technolgy; Natural Science Education; Guidance and Counseling; Primary Education; Linguistics Education; Early Chilhood Education; and Mathematics Education

International Journal of Educational Review is published by Doctoral Program, Faculty of Teacher Training and Education, Universitas Bengkulu, which disseminates the latest research findings from educational scientists in many fields of education. More detail, it focuses on publishing original research of educational management, social studies education, educational technology, natural science education, guidance and counseling, elementary education, linguistics education, early childhood education and mathematics education. It is a biannual journal issued on January and July. The editors welcome submissions of papers describing recent theoretical and experimental research related to (1) theoretical articles; (2) empirical studies; (3) practice-oriented papers; (4) case studies; (5) review of papers, books, and resources.

Address
Study Program Doctor of Education, Faculty of Teacher Training and Education, Universitas Bengkulu
Jl. WR. Supratman, Kandang Limun, Bengkulu 38371A, Telp. +63 736 21186. Fax. 073621186
e-mail: ijer@unib.ac.id

Content

Information and Communication Technology as Media Innovation and Sources of Learning in School

Dwi Amelia Galuh Primasari[1], Suparmanto[2], M. Imansyah[3]
[1]SD Negeri 10 Sungai Rotan, [2]SD Negeri 29 Gelumbang [3]SMA Negeri 1 Sungai Rotan
e-mail: galuhprimasari@yahoo.com

Abstract: The influence of the development of information and communication technology encourages innovation in learning activities. This study aims to describe the use of ICT as a medium and source of learning in schools. The research was conducted in 3 locations, namely Public Elementary School 2 Gelumbang and Public Elementary School 29 Gelumbang, Gelumbang District, and Senior Scondary School 1 Sungai Rotan, Sungai Rotan District, Muara Enim Regency, South Sumatra Province. This study uses a qualitative-descriptive approach, with observation techniques, and interviews. The results of the study concluded: (1) the teacher invites students to use ICT facilities in schools in learning activities; (2) the use of ICT-based resources and learning media in schools, among others, using computers, laptops, LCD (Liquid Crystal Display), smartphones, internet networks, and Microsoft office applications; (3) to improve teacher competence in utilizing ICT, teachers need to continue to familiarize themselves. Besides that, there should be a solution to the barriers to the use of ICTs, including conducting training through teacher working group activities (TWG), in order to support the improvement of teachers' abilities and knowledge in the ICT field.

Keywords: Information and Communication Technology; Learning Resources; Learning Media

1. Introduction

This study was motivated by the application of the Ruang Guru application that often appeared on television. In the ad, a mother who is very concerned about the quality of her children's learning appears. These concerns are increasingly becoming because they see their children are busy playing gadget. Mother's concerns in advertising this, in line with the concerns of the mothers in Bogor.

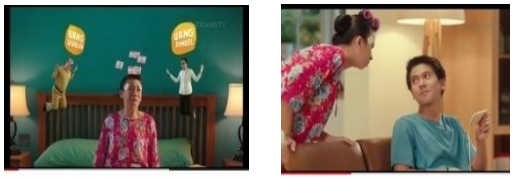


Image of the Room Application

Survey results from Hewlett-Packard and Paramadina University since 2018, found that mothers in Bogor are often frustrated when telling their children to stop playing gadget. The study also mentions 85% of students are addicted to using cellphones while in class, both to play online games access social media, or to search subject matter. Other research conducted by UNICEF together with the Ministry of Communication and Information, as well as Harvard University, United States, said that 98% of students have been literate on the internet, and 79.5% of them are internet users (radarbogor.id, accessed 24/04/2019).

The Association of Indonesian Internet Service Providers (APJII), revealed data collected since 2017 showed that most respondents (55.39%) claimed to access the internet more than six hours every day. While the rest claimed to access the internet around 2 to 6 hours a day. Data received by Tekno Liputan6.com also stated that 76.67% of respondents were able to spend up to three times or more to open the internet per hour (m.liputan6.com, accessed 04/26/2019).

Head of Google Indonesia Customer Marketing, Febriyani Elstria, said that based on data summarized by Google until the end of 2018, Indonesia is the third country with

the most Google Duo users in the world, after America and India (free. Kompas.id, accessed 04/25/2019).

According to BBC News Indonesia, the results of a recent study show Indonesian students love technology not only in using social media but also in education. This can be seen from research conducted by the leading educational organization Cambridge International, Cambridge University, England, which states that students in Indonesia use technology in the classroom more than in other countries. Indonesian students occupy the highest position (40%) globally in terms of computer room use, occupying the second position in terms of using desktop computers (54%), after the US, and there are more than two-thirds of students in Indonesia using smartphones while in class (67%), even they use it more to do homework, which is about 81%. This was agreed upon by Nendya Zahira, a grade XII student at Senior Scondary School Depok, West Java, who admitted that she was very happy to use technology including the internet to help her learn and do homework, such as in mathematics and history. He also revealed that internet technology was also used in teaching and learning activities at schools (bbc.com, accessed 04-24/2019).

In addition to the Teacher Room, since the widespread use of technology in the world of education, there have also been other learning support applications, such as Kahoot !, Quipper Masterclass, Quipper Campus, Quipper School, and HarukaEdu. The applications of ICT-based learning emerged as one form of innovation in the world of education.

The rise of learning applications, and the popularity of Indonesian students in terms of learning with the help of internet technology, according to the Research Director of the Paramadina Public Policy Institute (PPPI), Totok Amin Soefijanto, can be used by schools, as well as teachers. Especially to design a technology-based learning innovation (radarbogor.id, 04/24/2019).

The penchant for using internet-technology in Indonesia is no longer surprising, with the number of internet users in 2017 alone reaching 143.26 million, 49.52% of whom are users aged 19 to 34 years. The Head of the Information and Communication Technology Center of the Ministry of Education and Culture, Gatot Pramono, stated that with the help of technology, teachers and institutions can more efficiently manage teaching materials, so they can focus on students and their character formation while inspiring interest and critical thinking. Agreeing with this statement, Southeast Asia & Pacific Cambridge International Regional Director, Ben Schmidt, said that the application of technology in learning has signaled innovation and creativity in educational practice (bbc.com, accessed 04/24/2019).

The opinions above, also supported by Ansori (2017) and Kristiawan (2014) statement, the application of information and communication technology in learning, aims to be able to involve students in answering the challenges of learning innovation in the current era of globalization, including involving students in their experience using a variety of information technology products and communication. Students can use information and communication technology devices to explore, analyze, and exchange information effectively and efficiently. With direct experience, will increase the ability of students, develop independence, so students use information and communication technology appropriately, wisely, and effectively. Iqbaal Ramadhan, brand ambassadors from the Ruang Guru application, also agreed that the learning application (including the Teacher's Room) was born as an answer to the challenges of the development of information and communication technology in Indonesia. Where, they offer contemporary students who want to learn in a modern way, anywhere,

anytime, easily and cheaply. This is also supported by Aka (2017) research, ICT has changed the paradigm of delivering subject matter, as well as presenting learning activities to students. Learning is no longer limited to classrooms. Now, learning has gone beyond distance, so learning can be done anywhere.

Researchers argue that utilizing ICT in learning will help schools, especially teachers, to facilitate students' hobbies to access the internet, and use technological developments with a more pleasant approach. The fact that students often use the internet to search for learning material through Google in class or school (as stated in some of the findings above), can be used by teachers to conduct learning by utilizing technology assistance in schools. This opinion is supported by the opinion of Hardianto (Aka, 2017) that technological facilities can help teachers to motivate students to learn, facilitate learning, and accelerate learning. Technology is also able to maximize the use of interesting, innovative and fun media or learning resources to give to students. It is also in line with Rusman et al (2013) statement, that efforts to improve education quality need to follow technological developments, especially the use of technology in learning activities, because some research results have shown the effectiveness of learning to be better by using technology, compared to just applying conventional learning.

The application of information and communication technology is expected to involve students to participate in the phenomenon of world technological development. Along with the development of information and communication technology (ICT) which is so fast reaching all sectors of life, the demand for the application of concepts and mechanisms for technology-based teaching and learning has become unavoidable (Anshori, 2017). Aka (2017) revealed the presence of information and communication technology for the world of education, enabling the realization of pleasant learning, and encouraging student activity. The ability of ICT in the transfer of learning information/messages is very significant. An example of the use of ICT in education is by utilizing technologies such as Infocus / LCD, computers/laptops, internet networks, and smartphones as sources or learning media for students.

The existence of computers, laptops, and internet networks in schools are now increasingly widespread (Aka, 2014). Ansori (2017) believes that the use of communication and information technology as a source and medium of learning is one of the characteristics of advanced schools. Tatan and Sumiati (2011) state that in line with the need for innovative, varied, efficient and effective media and learning resources, the use of technology in learning becomes an innovation that should be appreciated by various groups.

The fact that today's students are so fond of learning by using technology rather than textbooks, and with various findings, as well as supporting opinions about the demands and the need for the use of ICT in the learning process encourages the need for research on this matter. Therefore, this research aims to provide an overview of the use of ICT as a medium and source of learning in schools.

2. Research Methods

This study is a qualitative-descriptive type study. The research subjects observed by researchers are activities or activities that use ICT in learning, both as media, as well as learning resources for students in schools. Data collection for research is by using observation and interview techniques. The study was conducted in three schools, namely at Public Elementary School 2 and 29 Gelumbang Kec. Gelumbang, and Senior Scondary School 1 Sungai Rotan Kec. Sungai Rotan, Kab. Muara Enim Prop. South Sumatra. The selection of the three as research locations for researchers is because Gelumbang Elementary School 2 is a pilot

school, one of the favorite schools in Gelumbang Subdistrict, and its educators are famous as creative, innovative educators. Besides that, Public Elementary School 2 Gelumbang is often used as a center for Teacher Activities (KKG), technology facilities for learning are available, and has been used by teachers in learning, although limited in number, teachers are often invited to be speakers or coaches in teaching activities in Gelumbang Subdistrict. Public Elementary School 29 Gelumbang was chosen because the headmaster was known to have succeeded in making a school that was once backward, rising to become one of the schools that are quite glimpsed now, plus, in this school efforts have been made to cultivate the use of technology (especially laptops) for teachers in teaching. Senior Scondary School 1 Sungai Rotan was chosen because it is a favorite high school in the Sungai Rotan sub-district, has complete computer lab facilities, and most of the teachers have been technology literate and can operate it.

The study began in early March, until the end of April 2019. The first step, researchers conducted interviews with teachers in all three research locations. While making observations, then draw conclusions as a result of the research.

3. Results and Discussion

Ansori (2017) explains the application of information and communication technology in learning, aims to be able to involve students in answering the challenges of learning innovation in the current era of globalization, including involving students in their experience using various information and communication technology products. Students can use Information and Communication Technology devices to explore, analyze, and exchange information effectively and efficiently. With direct experience, it will increase students' abilities, develop an initiative attitude, and willingness to learn independently, so that students are able to decide and consider how to use information and communication technology appropriately, wisely, and optimally.

The objectives stated by Anshori are in line with the expectations of the use of information and communication technology as a source and learning media, as well as a form of learning innovation in schools that are the location of research, namely Senior Scondary School 1 Sungai Rotan, Public Elementary School 2 Gelumbang, and Public Elementary School 29 Gelumbang. As a parent school in their respective sub-districts, the three schools take on the role of leaders in conducting learning innovations by using ICT in their teaching and learning activities. ICTs are used by teachers and students as learning media, and also as learning resources. This is of course supported by available facilities.

Based on the results of observations and interviews (March 11 to April 20, 2019), teachers in all three schools already have personal laptops, in schools also provided laptops for teachers, LCDs, speakers, and internet/wifi networks. The computer lab that is owned by the school also provides adequate computers and supporting devices, such as CPUs, headsets, and sitting speakers. All these ICT facilities are utilized properly and optimally by teachers to support student learning activities, as learning media, and learning resources in utilizing ICT and accessing the internet. According to Computer Lab teachers and class teachers in the three schools (interview, 12-13 April 2019), with the help of ICTs, students are expected to be able to learn more pleasantly, optimally, wisely in utilizing technology, and in reading. That way, students can more easily master the lesson objectives.

This is in line with Siahaan's explanation (Riyanto, 2011), stating that there are at least three electronic-assisted learning (TIK) functions for classroom learning, namely as an optional supplement, complement, and substitution. As a supplement, it means that the use of

technology by students is the same as giving them the opportunity to access various information widely so that they can improve their abilities, knowledge, and insights. As a compliment, it means that the use of technology can be programmed as the content of enrichment lessons to support the content of existing lessons, and further strengthen the level of student mastery of the subject matter presented. While the purpose of the substitution function is when technology is used as an alternative way of learning, with the aim that students can manage learning activities according to their time and activities flexibly., such as when students learn fully in face to face, or students want to learn partially in face to face and partly by using technology, or can also fully learn by utilizing technology.

The meaning of information and communication technology (ICT)

In terms of, information technology includes all matters relating to the process of using tools, and managing information. Meanwhile, communication technology is anything related to the use of tools to process and transfer information from one device to another (Aka, 2017). Information and communication technology can be interpreted as a tool used to process data, such as searching for, compiling, and storing data in various ways to obtain quality, relevant, accurate, and timely information (Wardiana, 2002). Whereas according to Miarso (2004), information & communication technology is a variety of infrastructure (in the form of hardware, software, user), systems, and methods used to obtain, send, receive, manage, interpret, store, organize, and present, to use data.

Anshori (2017) explains the notion of information and communication technology in terms of its wording, namely technology, information, and communication. Technology means the development or application of a machine, tool, material, and process that can help humans to solve their problems. The term technology often represents the discovery of new tools that use scientific principles. Meanwhile, the terms of information and communication are related to data. Information is the result of a process, manipulation, and organization of a group of data that describes the value of knowledge for its users. And communication is the process of conveying information (in the form of ideas, messages, and ideas) from the sender of information to the recipient of information.

So it was concluded that ICT is an entire system relating to the process of processing, manipulating, and transferring information with or between media, which consists of various devices, such as hardware, and software, and humans as the user that applies it.

The function of Information and Communication Technology (ICT)

According to Aka (2017), mastering information and communication technology is a demand for competence for a teacher, so that it is no longer a time for teachers to stutter technology. The use of ICT is carried out to create active and independent students. So, the teacher must try to master the use of ICTs to support learning needs and the needs of the task.

Wijayanti (2011) suggests four functions of using ICT for teachers, namely: (1) ICTs can be used to help with administrative needs. Such as administrative, correspondence, and messaging needs; (2) ICT to package teaching materials or materials. Packaging a variety of learning resources such as text, audio, graphics, video, and animation into a single unit of multimedia can increase learning effectiveness; (3) ICTs can help the learning management process; and (4) ICT can be used for technical support for learning processes/activities, and increasing knowledge, as well as insight.

ICT Mastery Competencies that must be mastered by the Teacher

Aka (2017) states that in order to optimize the use of ICT, teachers need to have competence in the form of mastering ICT mastery competency standards, teachers must also be more creative. According to Wijayanti (2011) the standards of teacher competence in mastering ICT are: (1) operating computers and supporting devices; (2) install, set up, maintain, and solve problems (troubleshooting) on the computer; (3) computer programming in one language; (4) processing words with a computer; (5) processing worksheets (sheets) and graphics with computers; (6) manage databases with personal computers or servers; and (7) make interactive presentations with computers.

Use of ICT as a Source and Learning Media in Schools

Learning resources are references, and objects used for learning activities (Mulyasa, 2010). Whereas AECT (Association for Educational Communications and Technology) and Banks (Aka, 2017) refer to learning resources as everything or power that can be used by teachers for teaching and learning purposes.

Learning media comes from Latin which is the plural form of the word medium which means intermediary or introduction. Learning media can be said as a tool that can encourage students to follow the learning process (Aka, 2017).

Arsyad (Rusman et al, 2013) stated that the media came from Arabic, wasilah, and wassail which meant intermediaries, and deliver messages from senders to recipients. Hamzah (2010) defines media as a communication tool used in conveying information from teachers to students, with the aim of encouraging them to take lessons. Schramm in Suherman (2008) defines learning media as information-carrying technology that can be used in the teaching and learning process. Gagne and Briggs (Suherman, 2008) view learning media as a tool that is physically used to convey the contents of subject matter, such as books, tapes, tape recorders, photos, images, videos, slides, television, and computers/laptops. For Miarso (Rusman et al., 2013), learning media is a channeling message that can stimulate thoughts, feelings, willingness and attention from those who learn, so as to encourage the learning process. and according to Nurseto (2011), learning media are a means to channel learning information.

So, the media and learning resources are interpreted as all devices or tools that can be a reference in exploring and discovering learning material, as well as being able to pass on learning information from the teacher to students, motivate students, generate attraction, and encourage the learning process. Several types of sources and ICT-based learning media that can be used by teachers in schools include:

Computers, speakers & laptops

A computer or laptop is a tool that can be used as a medium and also a source of learning. this device can be used to process data into information. Some of the main benefits of computers in schools are: (1) as a means of storing digital data; (2) as an audio tool and visualization of learning material; and (3) as a learning process program/software tool. Things that need to be considered in the use of computers include electricity security and usage procedures that need to be adjusted to the teacher's instructions.

Computers and laptops have been used at the research site. Both Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan, have used computers and laptops as media and sources of learning in the classroom. Based on the results of observations in the field, it appears that teachers use personal laptops in their classrooms. Through observation, teachers and students use computers in computer labs to learn computer applications, to support

lessons related to computer use such as Indonesian, Science, English, Accounting, Mathematics, and computer extra-curricular lessons such as making videos/movies, etc. Computer labs are also used by teachers and students to access the internet to find references to learning resources related to the subject matter being studied.

Pictures of students and teachers at the Computer Lab at Senior Scondary School 1 Sungai Rotan

Pictures of teaching activities for teachers at Public Elementary School 2 & Public Elementary School 29 Gelumbang using laptops, speakers, in various teaching and learning activities

LCD (Liquid Crystal Display)

LCD is a tool for presenting and projecting, information coming from laptops, and other information media such as DVD Player. LCD can enlarge the limited screen display on a laptop screen (Aka, 2017). The use of LCD projectors as a medium of learning, is already familiar, for teachers at Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan, because they are used to using these tools in learning, as well as in other activities such as moral formation activities, flash boarding schools, meetings, or trainings.

Teachers Picture using Laptop-LCD-LCD-internet

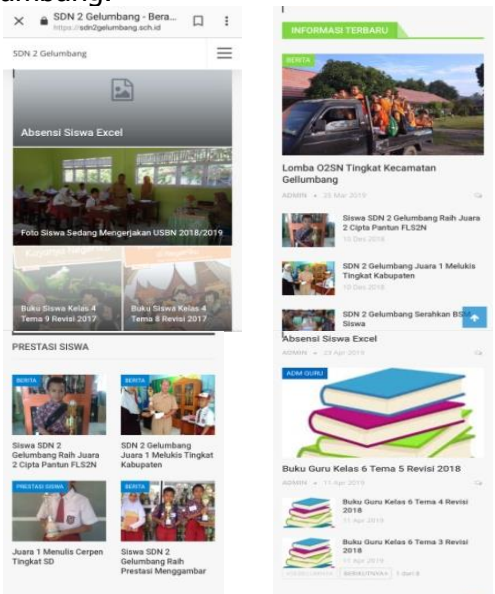
Internet Network

Internet network is a term for relationships between computers in a global network that allows each computer to exchange information (Aka, 2017). Internet networks can support information technology-based learning models and online communication (e-learning). The internet network can be used as a source of learning. With the existence of the internet network in schools, it allows students, as well as teachers, to access information and communication sources vary widely, without limits of space and time.

At Public Elementary School 2 Gelumbang Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan, the internet network in the form of school wifi, teachers and staff can be used in the school area tethering. The internet network is used as a source of reference material and learning materials, as

well as making up to the maintenance of the school web.

Based on observations, at present, Public Elementary School 2 Gelumbang, is the leader and the only primary school in Gelumbang District that already has a school website that can be accessed by teachers, students, and the community. In the web contains information about schools, teachers, classes, vision, and mission, up to subject matter and practice questions for students. Initially, this web was developed only to facilitate class VI students to be able to access additional learning materials and exam questions to practice at home. However, the web created and administered directly by the teacher of Public Elementary School 2 Gelumbang, has now been able to facilitate learning needs for students of class I to V as well. In it, there is also information about school data, teachers and staff of Public Elementary School 2 Gelumbang, learning tools, report card applications created and used by teachers at Public Elementary School 2 Gelumbang, achievements obtained by students from various competitions, to policies, events, and the latest information that happened At Public Elementary School 2 Gelumbang.



Web view image of Public Elementary School 2 Gelumbang, Public Elementary School2gelumbang.sch.id.

In addition, the internet network is also utilized by Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan to make pages on social media as a means of sharing information about schooling, and friendship events, between communities in schools, with communities outside of school, and alumni

Picture display of facebook page Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, & Senior Scondary School 1 Sungai Rotand.

Smartphone

Smartphones are mobile communication tools for sending data, as well as voice. In addition to its main function as a communication tool, smartphones also have the ability to be an effective learning resource, because they are easy to carry and have a myriad of information delivery applications, making it one of the practical ICT tools to use.

Various information from the internet and the application can be accessed via a smartphone. As a media and learning resource that is practical, light and effective.

At Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan, smartphones are indeed restricted in use, which is only carried by students in a certain subject matter at the teacher's command. In addition, students are prohibited from carrying their Android camera cellphones to school, this is to limit the activities of students playing cellphones/online games during class hours, avoiding criminal acts, and at the same time educating students to be able to use mobile phones according to their needs and wisdom. Smartphones and software applications in them (such as Google,

Youtube, Facebook, WhatsApp) are used as a means of exploring and sharing lesson information, communicating between principals and teachers, fellow teachers, and between teachers and students, and also as a medium to establish a friendship.

Display image of WhatsApp, a friendship and communication tool for the Big Family of Public Elementary School 2 Gelumbang

Smartphone

Smartphones are mobile communication tools for sending data, as well as voice. In addition to its main function as a communication tool, smartphones also have the ability to be an effective learning resource, because they are easy to carry, and have a myriad of information delivery applications, making it one of the practical ICT tools to use.

Various information from the internet, and the application can be accessed via a smartphone. As a media and learning resource that is practical, light and effective.

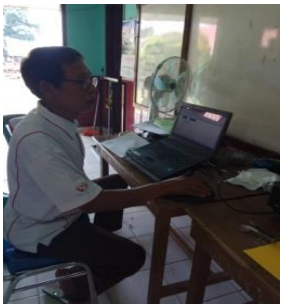
At Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Public Senior Scondary School 1 Sungai Rotan, smartphones are indeed restricted in use, which is only carried by students in certain subject matter at the teacher's command. In addition, students are prohibited from carrying their Android camera cellphones to school, this is to limit the activities of students playing cellphones / online games during class hours, avoiding criminal acts, and at the same time educating students to be able to use mobile phones according to their needs and wisdom. Smartphones and software applications in them (such as Google, Youtube, Facebook, Whats App) are used as a means of exploring and sharing lesson information, communicating between principals and teachers, fellow teachers, and between teachers and students, and also as a medium to establish friendship.

Display pictures of Whats App for friendship and communication means for the Big Family of SDN 2 Gelumbang

Powerpoint, Word, Excel application

Microsoft office media in the form of Microsoft Words, Microsoft Exel, and Microsoft PowerPoint PowerPoint presentations are some examples of types of software that are often used by teachers and students in learning activities.

The use of this application is familiar. The teacher, as well as students, can make text, images, tables, diagrams, graphics, enter data, values, photos or video, audio, and make animations as needed. This media is used in Public Elementary School 2 Gelumbang, Public Elementary School 29 Gelumbang, and Senior Scondary School 1 Sungai Rotan, among others, as an application to create and fill student report cards, assess students, make documents, make learning devices (RPP, Syllabus, etc.), process data, present material teach, conduct interactive learning activities, and other needs related to learning.

Pictures of teachers who are using Office applications

Barriers to Using ICTs in Schools

Although it has promoted the use of ICT in learning in schools, both as a media and as a learning resource, it certainly does not always run smoothly. Sometimes the use of ICTs is facing obstacles and obstacles in their application.

Based on observations and interviews with teachers in both schools (12, 19 and 26 April 2019) regarding the difficulties and obstacles faced in learning in schools, it was found, among others: (1) the number of supporting devices for the use of ICT in learning for students as a source and learning media is still very limited; (2) the development of ICT-based learning device software is still relatively difficult, requires a long time, and costs are quite large/expensive, especially if in application development requires other supporting devices; (3) programming knowledge and skills are needed to develop ICT-based learning materials/software, and not all teachers have this ability; (4) there is an inherent mindset for teachers, and students (especially senior teachers, and students with weak economic constraints) who are not accustomed to using ICT in their daily lives, that the use of ICT is complicated and difficult. So that it is lazy to learn and encourages itself to learn to use ICT and all supporting devices or applications; (5) even though its existence has become more widespread, not all ICT facilities are available such as the internet, computers and electricity networks. Also, not all people (teachers, especially students) who can afford to buy adequate ICT facilities; (6) increasingly sophisticated ICT equipment, enabling the misuse of ICT in education and learning.

Efforts to Improve ICT Mastery Competence for Teachers

In order to improve the mastery of ICT skills for teachers, an effort can be made to improve according to Mugara (2011), as follows: (1) sending teachers to attend training, upgrading, seminars or workshops on ICT that will help improve teacher competency later; (2) holding training activities, and disseminating ICT as media and sources of learning evenly for all teachers by inviting/presenting speakers or expert and competent resource persons. This is done at Public Elementary School 2 Gelumbang. Where teachers often appear to gather in the teacher's room to study laptops or operate a laptop application, by appointing several teachers who are considered to master ICT as tutors, mentors, and speakers, who will guide other teachers. Based on the information from Mr. S, the sixth grade teacher at Public Elementary School 2 Gelumbang who has the ability of ICT, he is often visited by teachers from other schools who want to learn or at least only to ask some things that they do not master related to the development of ICT and its operation; (3) providing and completing various facilities, infrastructure, and ICT-based media that can support the desired learning activities; (4) carry out learning by using various strategies and methods of ICT-based learning that teachers do consistently, as a form of training and habituation; and (5) if necessary, conduct comparative studies to other schools that are considered more advanced in terms of mastering the ICT.


Pictures of teacher ICT competency enhancement activities (seminars, peer tutoring, handover borrow-use school laptops for teachers to use in class, etc.)

4. Conclusion

Current conditions that show the magnitude of the influence of the development of information and communication technology on students' interests and learning styles, encourage education actors, including schools, and teachers, to take part in improving the quality of education according to the needs of the times. One of them is ICT-based learning. The use of ICT aims to help and support the arrival of learning information to students optimally, effectively and impressively. So, it is hoped that, with the help of ICT as a media and learning resource for students, it will be able to improve the quality of the teaching-learning process, motivate students, and encourage students' ability to achieve the desired learning goals. ICTs function, among others, to assist administrative work, can be used to help package and present teaching materials, assist learning management processes, and technical support and increase knowledge. The use of ICTs as a medium and source of learning in schools includes the use of computers/laptops, LCDs, internet networks, smartphones, and their applications. To be able to apply ICT in learning, teachers need to set certain competency standards related to ICT mastery, including: (1) operating computers and supporting devices; (2) install, set up, maintain, and solve problems (troubleshooting) on the computer; (3) program computers in one language; (4) processing words with a computer; (5) processing worksheets (sheets) and graphics with computers; (6) manage databases with personal computers or servers; and (7) make interactive presentations with computers. In the application of ICT in schools, there are several obstacles that are often faced, such as obstacles in terms of the number of devices available, the presence of operators / programmers or people who master ICT-based capabilities, the time and cost constraints needed to develop, create and maintain program and application software ICT, the perception that is attached to teachers and students that ICT is difficult and complicated to operate, and obstacles in the form of availability of ICT facilities such as the internet, electricity, and decent and adequate hardware. So to deal with these obstacles, efforts need to be made to increase teacher competency in mastering ICT, in the form of various trainings, seminars, ICT related workshops, providing and complementing ICT supporting facilities in schools, familiarizing themselves with how to continue to implement ICT-based learning even though initially it feels difficult, and if necessary a comparative study is needed to other schools that are more advanced in applying the ICT.

Acknowledgement

The authors gratefully acknowledge the headmasters of Public Elementary School 2 Gelumbang and Public Elementary School 29 Gelumbang, Gelumbang District, and the headmaster of Senior Scondary School 1 Sungai Rotan, Sungai Rotan District, Muara Enim Regency, South Sumatra Province who permitted us to do research in their schools. Secondly, we would like to thank for all teachers, support staff, and students of three school, who helped us to develop and

complete this project through their participation and cooperation.

References

Aka, K. A. (2017). Pemanfaatan Teknologi Informasi Dan Komunikasi (TIK) Sebagai Wujud Inovasi Sumber Belajar Di Sekolah Dasar. *ELSE (Elementary School Education Journal): Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar Volume 1 Nomor 2a Desember 2017*.

Aka, Kukuh Andri. (2014). *Pengembangan Multimedia Interaktif Pada Pembelajaran Pendidikan Kewarganegaraan (PKn) Berorientasi Strategi Pembelajaran Inkuiri Sosial (Studi pada siswa kelas V SDNL Sawojajar 02 Kecamatan Kedungkandang Kota Malang)*. DISERTASI dan TESIS Program Pascasarjana UM.

Anshori, Sodiq. (2017). Pemanfaatan TIK sebagai Suber dan Media Pembelajaran di Sekolah. *Civic-Culture: Jurnal Ilu Pendidikan PKn dan Sosial Budaya.* Hlm.10-12. ISSN 2579-9924 (online), ISSN 2579-9878 (cetak).

Kristiawan, M. (2014). A Model for Upgrading Teachers Competence on Operating Computer as Assistant of Instruction. *Global Journal of Human-Social Science Research*.

Mulyasa. (2010). *Kurikulum Tingkat Satuan Pendidikan*. Bandung: PT Remaja Rosdakarya.

Mugara, R. (2011). *Meningkatkan kompetensi guru melalui penguasaan teknologi informasi dan komunikasi (TIK)*. Universitas Pendidikan Indonesia.

Nurseto, T. (2011). Membuat Media Pembelajaran Yang Menarik. *Jurnal Ekonomi Dan Pendidikan Vol.8* .

Rusman, Dkk. (2013). *Pembelajaran Berbasis Teknologi Informasi & Komunikasi, Mengembangkan Profesionalitas Guru.* Jakarta: Rajawali Pers.

Suherman, Y. (2008). Pengembangan Media Pembelajaran. *Diklat Profesi Guru PLB Wilayah X Jawa Barat.* Bandung: Bumi Makmur

Wijayanti, Inggit Dyaning .2011. *Peningkatan Pendidikan Berbasis ICT*. UIN Sunan Kalijaga: Yogyakarta.