



## Utilization of Information and Communication Technology in Online Learning at School

Salim <sup>1)</sup> \*, Rahmad Prajono <sup>1)</sup>, Asriyani Mulia Basri <sup>2)</sup>  
Nurhayati <sup>3)</sup>

<sup>1)</sup>Department of Mathematics Education, Universitas Halu Oleo. Kendari, Indonesia.

<sup>2)</sup>Department of Accounting Education, Universitas Halu Oleo. Kota Kendari, Indonesia.

<sup>3)</sup>Department of Early Childhood Education Teacher Education, Universitas Halu Oleo. Kota Kendari, Indonesia.

*Received: 03 January 2024*

*Revised: 03 March 2024*

*Accepted: 30 April 2024*

### Abstrak

The objectives of this study are to (1) determine the portrait of the utilization of information and communication technology in online learning at SMA Negeri 1 Pasarwajo, (2) determine the response of SMA Negeri 1 Pasarwajo students to the utilization of information and communication technology in online learning, (3) analyze the implementation of online learning by utilizing information and communication technology at SMA Negeri 1 Pasarwajo. The type of research used in this study is mixed methods, namely research that combines qualitative and quantitative research. The results of this study show (1) online learning is carried out using online learning applications such as WhatsApp LMS, google classroom, quiper school and video conferencing with zoom and cloudX and network availability for teachers is sufficient starting from devices, data packages, and network signal connectivity; (2) students of SMA Negeri 1 Pasarwajo have a fairly good response regarding their participation in online learning by utilizing ICT; (3) the implementation of online learning shows that curriculum achievement is only 65%, teachers and students easily get learning supplements through online learning applications, teachers have difficulty in measuring attitudinal and psychomotor aspects, students have difficulty in signal accessibility and limited online learning devices.

**Keywords:** online; learning; information and communication technology.

## INTRODUCTION

The covid-19 pandemic that occurred in 2021 brought concerns to the implementation of education and learning in senior high schools. The most severe conditions are experienced by schools located far from urban areas with limited internet access and infrastructure facilities. There are four obstacles faced by the world of education during the Covid pandemic, namely limited internet mastery by teachers, inadequate infrastructure, limited internet access, and unprepared funds in emergency conditions (Syah, 2020). Schools in urban environments with internet access and infrastructure and good internet mastery skills do not experience difficulties in implementing online learning. This condition is the result of events during the covid-19 pandemic, with the use of online learning platforms through google applications (google classroom, google forms, google docs, google spreadsheets) by conducting online searches of the implementation of learning during covid-19 (Dewi, 2020).

Basically, the learning process according to (Pane & Dasopang, 2017) is a system that involves a unity of components that are interrelated and interact with each other to achieve an optimal expected result in accordance with predetermined goals. The benefits that can be taken in learning according to (Suyono & Hariyanto, 2016) are gaining knowledge developed

\* Korespondensi Penulis. E-mail: [salimpsa@gmail.com](mailto:salimpsa@gmail.com)

through experiences developed through sharing, thus providing benefits for others. One of the breakthroughs in improving the learning process is characterized by the presence of ICT-based media in education. The utilization of ICT-based media is a must that must be done to support the competitive era of technological progress. In the learning process, the media is in the form of audio, audio-visual, and internet media. Meanwhile, in supporting the learning process, ICT is utilized for academic services (Istiyarti & Purnama, 2014). Although the internet was not initially developed for educational purposes, it is now one of the means of increasing access to education, disseminating educational content, and other educational improvement strategies (Bokova & Touré, 2013). The integration of ICT and internet utilization for education and curriculum aims to make the value of education more targeted, innovative, and transformative (Shahmir et al., 2010; Smaldino, 2011).

Online learning, according to (Riyana, 2019) emphasizes more on the accuracy and foresight of students in receiving and processing information presented online. In the implementation of online learning, challenges and obstacles are not only limited to the supporting facilities of technology and internet networks. Other obstacles to the implementation of online learning include the readiness of human resources, unclear government directives, and the absence of an appropriate online learning curriculum (Arifa, 2020). The ability to use technology, information and communication (ICT) is an important factor in online learning. Competence and literacy in using computers and surfing in cyberspace are the basic skills needed in implementing online learning (Triwibowo, 2020). Furthermore, (Shapova, 2014) states that competence and level of ICT literacy affect the effectiveness and efficiency of teaching and learning process.

The concept of online learning has the same concept as e-learning. According to (Hartono, 2016), through e-learning, students not only listen to the description of the material from the educator but also actively observe, do, demonstrate, and so on. Teaching materials can be virtualized in various formats so that they are more interesting and more dynamic so that they can motivate students to go further in the learning process. E-learning is all learning activities that use the help of electronic technology, which can be applied in conventional education and distance education (Rusman, 2013). E-learning is a new learning method in the form of a combination of network technology and multimedia married with pedagogy and andragogy (Sutopo, 2012). E-learning is learning that utilizes internet technology support. In e-learning, teachers do not just upload learning materials that can be accessed online by students, but teachers also evaluate, communicate, collaborate, and manage other aspects of learning (Surjono, 2013).

According to (Sari, 2015) the advantages of online learning are building a new learning atmosphere, online learning will bring a new atmosphere for students, who usually learn in class. The new atmosphere can foster students' enthusiasm in learning. As for some of the disadvantages that occur in online learning, namely children are difficult to focus on learning because the home atmosphere is not conducive. Limited internet quota or internet package or wifi which is the link in online learning as well as interference from several other things. In line with the opinion of (Hadisi & Muna, 2015) online learning results in a lack of interaction between teachers and students and even between students themselves. This lack of interaction can slow down the formation of values in the teaching-learning process. Online learning that is currently implemented is a new thing that is felt by both teachers and students.

Online learning is part of an effort to increase awareness of the spread of the Covid-19 virus during a pandemic (Nuryana, 2020). Online learning at all levels of formal education is also a real effort made by the government to break the chain of the spread of Covid-19 at that time (Kemdikbud, 2020). SMA Negeri 1 Pasarwajo as a school located in the center of the capital city of Buton Regency will implement online learning since the odd semester of the 2020/2021 academic year which coincides with efforts to prevent the spread of the covid-19

virus among students. Online learning aims to meet educational standards by utilizing Information and Communication Technology (ICT) using computer devices or gadgets that are interconnected between students and teachers and so that through the use of this technology the teaching and learning process can still be carried out properly. The utilization of ICT is expected to be able to overcome the teaching and learning process. This is possible to be done well because the majority of Indonesian people currently use the Internet.

ICT has a use in facilitating the learning process of students and that ICT will not replace his position as a teacher, but rather help him to, at least, store and present the concepts, principles, procedures that he wants to teach. The strategic effort that needs to be made is that teachers need to increase their confidence and be involved and participate in its development, namely the development of ICT for their learning in order to improve the quality of the process and student learning outcomes. According to (Alawiyah (2013) teachers are at the forefront of education in Indonesia. The success of education is in the hands of teachers, especially now that the role of teachers is quite central.

The purpose of this study is to (1) determine the portrait of the use of information and communication technology in online learning at SMA Negeri 1 Pasarwajo, (2) determine the response of SMA Negeri 1 Pasarwajo students to the use of information and communication technology in online learning, (3) analyze the implementation of online learning by utilizing information and communication technology at SMA Negeri 1 Pasarwajo.

## **METHODS**

This type of research is field research, which intensively studies the utilization of information and communication technology in learning during the Covid-19 pandemic at SMA Negeri 1 Pasarwajo. This research approach uses mixed methods, namely research that combines qualitative and quantitative research. According to (Creswell, 2010) mixed research is a research approach that combines qualitative and quantitative methods.

The mixed method strategy used in this research is sequential mixed methods with a sequential explanatory strategy. In this research, the first stage collects and analyzes quantitative data to answer the problem of how the response of SMA Negeri 1 Pasarwajo students to the use of information and communication technology in online learning. Then the second stage collects and analyzes qualitative data to answer the problems (1) how is the portrait of the use of information and communication technology in online learning<sup>19</sup> at SMA Negeri 1 Pasarwajo, (2) how is the implementation of online learning by utilizing information and communication technology at SMA Negeri 1 Pasarwajo.

This research was conducted at SMA Negeri 1 Pasarwajo with the subjects in this study were subject teachers of SMA Negeri 1 Pasarwajo and students of SMA Negeri 1 Pasarwajo. Determination of research respondents was carried out by purposive sampling with consideration: (1) teachers who were taken to represent their respective fields of study; (2) students who were taken based on active online learning in each class. Data collection techniques were carried out systematically and standardized to obtain the required data. Data collection used questionnaire and interview methods. Data analysis used in this study used two types of analysis, namely quantitative data analysis and qualitative data analysis. Quantitative data were analyzed descriptively in the form of averages and categorizations. Categorization of student responses to the use of information and communication technology in online learning in Table 1.

**Table 1. Categorization of Student Responses to the Use of Information and Communication Technology in Online Learning**

No	Percentage	Criteria
1	75% - 100%	Good
2	50% - 74%	Good enough
3	25% - 49%	Not Good
4	0% - 24%	Not Good

Qualitative descriptive analysis goes through several stages to conclude facts or reality, namely: (a) editing process: namely re-examining records or information obtained from data in the field to fulfill whether the records or information are good enough or not, and can be immediately prepared for the purposes of the next process. Data obtained from interviews and observation notes are re-examined; (b) classifying: after sorting the required data, the classifying process is to re-read and review in depth all data obtained from observations, interviews and documents. The data is grouped according to the formulation of the problem; (c) verification; namely the data obtained from the editing and classifying process is cross-checked again so that its validity is fulfilled: (d) analyzing; namely the process of simplifying data into a form that is easier to read and interpret: (e) concluding; which is the result of a process of drawing conclusions from the research process that produces an answer that generalizes all the data that has been obtained from all research activities that have been carried out, both through interviews and questionnaires.

## RESULTS AND DISCUSSION

Student response data was obtained through the administration of a closed questionnaire related to the utilization of information and communication technology in online learning which was distributed online through google form. The results of 219 students' responses can be seen in Table 2 below.

**Table 2: Students' Response in Online Learning by Utilizing ICT**

No	Indicator	Percentage	Categorization
1	I access teacher-given materials easily during online learning	72,60%	Enough
2	I do the assignments given by the teacher during online learning	76,94%	Good
3	I utilize the internet to find other learning resources	77,63%	Good
4	I understand and comprehend running the online learning application used by the teacher	75,68%	Good
5	I have my own computer/laptop/smartphone used for online learning	77,74%	Good
6	I have good skills in using technology tools for online learning	74,89%	Enough
7	I have my own internet network at home to study online	56,62%	Enough
8	Online learning through applications used by teachers can make me more motivated to learn	64,27%	Enough
9	Online learning through the application used by the teacher makes mastery of the subject matter better	59,13%	Enough
10	The content of the subject matter shared by the teacher through the online learning application is	71,92%	Enough

No	Indicator	Percentage	Categorization
	easy to access and learn.		
11	My parents support online learning	75,34%	Good
12	The online learning application used by teachers can be accessed anywhere and anytime.	83,68%	Good
13	There is material content in the form of videos shared by teachers on online learning applications	82,42%	Good
14	There is material content in the form of word/powerpoint/pdf files shared by the teacher in the online learning application.	81,62%	Good
15	During online learning there is a learning evaluation conducted by the teacher through the online learning application	85,73%	Good
16	Teachers provide subject matter in accordance with the existing curriculum	94,18%	Good
17	Teachers are proficient in using online learning applications	88,47%	Good
18	The school provides assistance to you to support online learning	92,81%	Good
19	Do you agree that online learning should continue to be used	44,86%	Less
	<b>Total Average</b>	<b>74,73%</b>	<b>Cukup</b>

Based on the results in Table 2 above, it shows that SMA Negeri 1 Pasarwajo students have a fairly good response regarding their participation in online learning by utilizing ICT. However, there are unique results from the students' responses, namely that most students do not agree if online learning is still implemented. Data on the utilization of ICT by teachers in learning during online learning is obtained through the provision of open questionnaires distributed online through google form. The results of 14 teachers' responses representing each field of study can be seen in Table 3 below.

**Table 3. Teachers' Perspectives on ICT Utilization in Online Learning**

No	Question	Description
1	Previously used an online learning application	Most do not use online learning apps.
2	Online learning LMS application used	Most do not use online learning LMS applications.
3	Online learning video conference application used	Most do not use online learning video conferencing apps.
4	So far, learning using online learning applications	Most use online learning apps
5	Online learning LMS application used	Most use WhatsApp, Google Classroom and Quiper School
6	Online learning video conference application used	Most use CloudX and Zoom
7	LMS applications that are effective in online learning	Google Classroom, and Quiper School
8	Video conferencing apps that are effective in online learning	Zoom
9	Online learning with the apps used can add to	Increase students' learning

No	Question	Description
	students' learning experience	experience
10	Do you agree with the current use of online learning?	Some respondents disagree with online learning
11	During online learning, parents accompany their children to study.	Parents do not regularly accompany their children during online learning
12	Technology devices used during online learning	Most use laptops and smartphones
13	Internet network connectivity on technology devices used during online learning	Most use school wifi when at school and use cell phone hotspots when at home
14	Internet network access during online learning in your location.	Stable/normal
15	During online learning, students follow it well.	Most of them follow online learning well

Data on the implementation of online learning by utilizing ICT was obtained through interviews with 14 teachers representing each field of study. The interview results have similarities and differences in answer variations. However, the researcher took the interview results in a classification that focused on the questions asked. The results of the interview revealed by the MM subject that “one way to design learning material content to supplement student learning is by sending learning videos to students, using quiper school to provide learning materials and assignments for students. While the subject RU revealed the learning model/method for online learning activities using, online discussions via WhatsApp and through the e-learning application. Subject AL, also revealed learning evaluation in online learning by utilizing google form to compile questions in online form, student activeness during online learning and discipline in sending assignments, and students make their own questions and answers and send them to the teacher in the form of files, audio, or video.

School support for online learning was also revealed by subject AM that the school collaborated with Telkomsel and Siberian with the help of CloudX video conferencing application, the school also held Google Classroom and Quipper School training. In terms of teacher ability, according to Subject AM, most teachers are proficient in using ICT, especially related to LMS and video conferencing. However, only a small number have experienced a few obstacles in its use. Meanwhile, according to the subject of RL, the obstacles to the implementation of online learning include: it is difficult to measure student understanding for sure because the results of tests and assignments that are done cannot be ascertained whether they are done independently or with the help of others, students do not have data packages so that online learning does not run smoothly, unstable networks where students are located and the limitations of electronic devices owned by students in online learning, and unstable internet network signals at the location of students learning online at home. This is in line with research conducted by (Apriyana, Lestari, & Januardi 2021) that during online learning, students have enough difficulty with technical obstacles that affect the signal, lack of mutual interaction between students and teachers (Putri & Nur, 2022), students also have difficulty understanding the material delivered by the teacher during online learning activities and delayed responses due to signals that disrupt student communication with teachers (Fathonah & Bukhori, 2021).

Subject AM, also provided recommendations that the LMS and video conference application model that is suitable for design and use in online learning in the future at least contains: the application designed is easy to understand with simple features according to learning needs, the application designed is safe to run so that user data security is guaranteed,

LMS and video conferencing are combined into one unit, not separated with simple features, easily accessible, easy to customize by users and does not consume a lot of internet quota.

The utilization of information and communication technology in online learning is very helpful in the online learning process so that all learning processes can run well. Although we are currently struggling to face the era of industrial revolution 4.0, all learning processes can still be done well thanks to the help of advances in information and communication technology (ICT) which is very advanced today. The existence of ICT can connect teachers and students online without having to meet face-to-face through online learning applications that are available both free and paid.

The results of students' responses related to the utilization of ICT in online learning show that SMA Negeri 1 Pasarwajo students have a fairly good response regarding their participation in online learning by utilizing ICT. However, there are unique results from the students' responses, namely that most students do not agree if online learning is continuously carried out. This is because students are used to being at school to interact with their friends, play and joke with their friends and meet face to face with their teachers. The results of this study indicate that online learning at SMA Negeri 1 Pasarwajo is the first time using online learning applications ranging from LMS and video conferencing during the covid-19 pandemic. However, thanks to covid-19, teachers want or don't want to be familiar with online learning applications. Some of the online learning applications used by SMA Negeri 1 Pasarwajo teachers include google classroom LMS and quiper schools and video conferencing with zoom and cloudX. In its implementation, this online learning application is quite helpful for teachers in providing subject matter so that it can reach students. However, the internet network factor and the availability of electronic devices owned by students are obstacles during the implementation of this online learning. The school also provides support related to the implementation of online learning in the form of providing internet data packages for teachers and students and subscribing to quiper schools as an online learning supplement..

## **CONCLUSION**

Based on the results of this study, the conclusions of this study are: (1) the utilization of information and communication technology in online learning at SMA Negeri 1 Pasarwajo is carried out well by using online learning applications such as WhatsApp LMS, google classroom, quiper school and video conferencing with zoom and cloudX and network availability for teachers is quite adequate starting from devices, data packages, and network signal connectivity: (2) the response of SMA Negeri 1 Pasarwajo students to the use of information and communication technology in online learning, namely SMA Negeri 1 Pasarwajo students have a fairly good response regarding their participation in online learning by utilizing ICT. However, there are unique results from the students' responses, namely that most students disagree if online learning continues to be implemented without a face-to-face combination: (3) the implementation of online learning by utilizing information and communication technology in SMA Negeri 1 Pasarwajo shows that teachers and students easily get learning supplements through online learning applications, teachers have difficulty in measuring students' attitudes and psychomotor aspects during online learning, students have difficulties in signal accessibility and limitations of online learning devices, and teachers make variations in the selection of learning models/methods, learning materials, and learning evaluations, and school leaders provide learning support through providing internet packages and LMS quiper school subscriptions.

## **REFERENCES**

Alawiyah, F. (2013). Peran Guru dalam Kurikulum 2013. *Jurnal Aspirasi*, 4(1), 65–74.

- Apriyana, J., Lestari, N. D., & Januardi. (2021). Analisis Kesulitan Belajar Siswa Dalam Pembelajaran Daring Di SMK Se-Kecamatan Kayuagung. *PROMOSI: Jurnal Program Studi Pendidikan Ekonomi*, 9(2), 86-94
- Arifa, F, N. (2020). Tantangan Pelaksanaan Kebijakan Belajar dari Rumah dalam Masa Darurat Covid-19. *Kajian Singkat Terhadap isu Aktual dan Strategis*, 12(7), 13-18.
- Bokova, I. & Touré, H. I. (2013). *Technology, Broadband, And Education – Advancing The Education For All Agenda*. Paris: UNESCO.
- Creswell, J. W. (2010). *Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed*. Yogyakarta: Pustaka Pelajar.
- Dewi, W. A. F. (2020). Dampak Covid-19 Terhadap Implementasi Pembelajaran Daring Di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 2(1): 55–61. <https://doi.org/https://doi.org/10.31004/edukatif.v2i1.89>
- Fathonah, U., & Bukhori, H. A. (2021). Analisis Kesulitan Siswa Dalam Pelaksanaan Pembelajaran Bahasa Jerman Secara Daring Selama Pandemi Covid-19 Di Sekolah Menengah Atas. *Edukatif: Jurnal Ilmu Pendidikan*, 3(4), 1152-1160.
- Hadisi, L., & Muna, W. (2015). Pengelolaan Teknologi Informasi dalam Menciptakan Model Inovasi Pembelajaran (E-Learning). *Jurnal Al-Ta'dib*, 8(1), 117–140. <https://doi.org/10.31332/ATDB.V8I1.396>
- Hartanto, W. (2016). Penggunaan E-Learning Sebagai Media Pembelajaran. *Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi Dan Ilmu Sosial*, 10(1).
- Istiyarti, & Purnama, E. K. (2014). Pemanfaatan TIK untuk Pembelajaran. *Kwangsa: Jurnal Teknologi Pendidikan*, 2(1), 63-70.
- Kemdikbud. (2020). *Surat Edaran Nomor 15 Tahun 2020 Tentang Pedoman Penyelenggaraan Belajar Dari Rumah Dalam Masa Darurat Penyebarana Corona Virus Disease (Covid-19)*. Jakarta: Kementerian Pendidikan dan Kebudayaan Republik Indonesia.
- Nuryana, A. N. (2020). *Dampak Pandemi Covid-19 Terhadap Dunia Pendidikan*. Retrieved March 1, 2021, from <https://kabarpriangan.com/dampak-pandemi-covid-19-terhadap-dunia-pendidikan/>
- Pane, A., & Dasopang, M. D. (2017). Belajar Dan Pembelajaran. *Jurnal Kajian Ilmu-Ilmu Keislaman*, 3(2), 333–352. <https://doi.org/10.24952/fitrah.v3i2.945>
- Putri, R. N. & Nur, S. (2022). Kesulitan Belajar Siswa Selama Pembelajaran Daring Dimasa Pandemi COVID-19. *Jurnal J-BKPI*, 2(1).
- Riyana, C. (2019). *Produksi Bahan Pembelajaran Berbasis Online*. Jakarta: Universitas Terbuka.
- Rusman. (2013). *Model-Model Pembelajaran*. Jakarta: Rajagrafindo Persada.
- Sari, P. (2015). Memotivasi Belajar dengan Menggunakan E-Learning. *Jurnal Ummul Quro*, 6(2), 20–35.
- Shahmir, S., Hamidi, F., Bagherzadeh, Z., & Salimi, L. (2010). Role of ICT in the Curriculum Educational System. *Procedia Computer Science*, 3(2011), 623-624. doi:10.1016/j.procs.2010.12.104
- Shopova, T. (2014). Digital Literacy of Students and Its Improvement at the University. *Journal of Efficiency and Responsibility in Education and Science*, 7(2), 26-



32.

- Smaldino, S.E. (2011). Preparing students with 21st century ICT Literacy in Math and Science Education. *Journal of Curriculum and Instruction*, 5(1), 1-3. doi:10.3776/joci.2011.v5n1p1-3
- Surjono, D. H. (2013). *Membangun Course E-learning Berbasis Moodle*. Yogyakarta: UNY Press.
- Sutopo, A. H. (2012). *Teknologi Informasi dan Komunikasi dalam Pendidikan*. Yogyakarta: Graha Ilmu.
- Suyono, & Hariyanto. (2016). *Belajar dan Pembelajaran Teori dan Konsep Dasar*. Bandung: PT Remaja Rosdakarya.
- Syah, R. H. (2020). Dampak Covid-19 Pada Pendidikan Di Indonesia: Sekolah, Keterampilan, Dan Proses Pembelajaran. *SALAM: Jurnal Sosial Dan Budaya Syar-I*, 7(5). <https://doi.org/10.15408/sjsbs.v7i5.15314>
- Triwibowo, W. (2020). *Gagap 3 Aspek Vital: Kuliah Online Di Tengah Covid-19 Bisa Perparah Gap Akses Pembelajaran Bermutu Bagi mahasiswa Miskin*. Retrieved March 1, 2021, from <https://theconversation.com/amp/gagap-3-aspek-vital-kuliah-online-di-tengah-covid-19-bisa-perparah-gap-akses-pembelajaran-bermutu-bagi-mahasiswa-miskin-13493>.