

## Investigation of Teacher Attitudes of Using Information and Communications Technology (ICT) for Pandemic Era

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### Abstract

In 21st century learning, especially teaching, the use of Information and Communications Technology (ICT) is very influential in modifying teaching and learning. Teachers are expected to be able to maximize the use of technology for the benefit of students, especially in classroom learning. This article aims to investigate the attitudes of teachers towards the use of ICT in high grades such as grades 4, 5 & 6, and the challenges faced by teachers in the use of ICT in high grades. This survey was conducted involving 30 high school teachers who teach in primary schools. This article used a quantitative research design. Respondents demonstrated a positive attitude towards the use of ICT because most of them felt comfortable using ICT as a tool in the teaching and learning process, especially in the current pandemic conditions. In addition, lack of teacher training regarding available computers or software, lack of time to prepare lessons due to other administrative work, insufficient time to master new software or integrate ICT during class periods and lack of support from administrators or colleagues are also challenges faced. by teachers when applying ICT in high grades. This research has implications, namely as a means of communication, managing, integrating, evaluating and creating information in teaching and learning in the classroom. As well as the use of technology in the 21st century in the learning process as well as teaching to achieve students' thinking and learning skills.

**Keywords:** Teacher Attitudes, Learning Pandemic Time, Online Learning

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### INTRODUCTION

In this globalization era, technology development is very fast nowadays. We cannot avoid this situation as educators. This does not mean that we must be resistant to responding to this situation, but that we must be creative and innovative in using technology so that learning is no longer monotonous and conservative. In the use of ICT for 21st century learning, it must be optimal and need to be developed again. With the presence of Information and Communications Technology (ICT) by providing challenges in the world of education, students are more interested in learning ICT than other learning materials (Nikolić, V. et al, 2018), students are even willing to spend hours in front of the computer to access the internet and look for information that cannot be obtained at school. Phenomena like this become a big task and homework for the world of education to be able to adopt and make learning innovations (Konig, et al., 2020; Dewi, Utami,

Suhono, 2021). Do not let the world of formal education only be used as a place to get a diploma without contributing to fostering the next generation of the nation's struggle who will become future leaders.

Learning in the 21st century must also be able to prepare the Indonesian human generation to meet the advancement of information and communication technology in social life. 21st century learning is an implication of the development of society from time to time. As it is known that society has developed from a primitive society to an agrarian society, then to an industrial society, and is now shifting towards an informative society. Informative society is characterized by the development of digitalization (Khalin, & Chernova, 2018; Artemieva, et al., 2020). From 1960 until now, the use of computers, the internet and mobile phones has grown rapidly. Society has changed from an offline society to an online society. For the record, internet users in Indonesia in 2015 as many as 88.1 million people have increased to as many as 132.5 million people. Due to the increasingly rapid development of digitalization in society, inevitably learning in schools in Indonesia must follow these developments. The implications for learning in schools in Indonesia require that all levels of education must master ICT literacy skills. Teachers, students, and even parents must be literate in technology and communication media, be able to communicate effectively, think critically, be able to solve problems and be able to collaborate.

Science is growing day by day in line with the development of technology and information. The existence of competent and professional teachers is one of the requirements that must be met to improve the quality of education to compete with other developed countries. As stated by Kartilawati and Mawaddatan Warohmah (2014), in carrying out their duties, teachers are required to have various abilities or skills and are based on abilities and skills as a requirement of a teaching profession. Then, the teacher must be able to adapt to this situation otherwise it will be outdated and obsolete with time. The main key to the rapid advancement of education is the ability of teachers to process and innovate every learning process they teach. Teachers are expected to continue to make efforts to correct and update their skills from time to time. In line with Wartomo's statement (2016), teacher competence must be oriented towards the development of information and communication technology and this digital society.

As a result, there is an increasing demand for the use of technology in Indonesia for the improvement of teaching and learning methods. Therefore, the knowledge, understanding and attitudes of teachers must also adapt to the needs of the current economy to produce a workforce that meets the demands of today's globalization. Moreover, the recent COVID-19 pandemic has also caused an unexpected change in our educational system where online learning is becoming a measure of organizational agility (Wu, 2020).

However, most teachers often choose teacher-centered pedagogy especially in rural areas where the use of ICT is quite a challenge for some areas due to lack of facilities and lack of knowledge in using ICT. The statements supported by Yunus et al. (2012) stated that teachers who often use teacher-centered pedagogy can cause a lack of interaction with students. In addition, most teachers prefer to use ready-made materials such as their own textbooks or workbooks.

As we found in other journals regarding the implications of learning in schools in Indonesia, all levels of education must master ICT literacy skills. Teachers, students, and even parents must be literate in technology and communication media, be able to communicate effectively, think critically, be able to solve problems and be able to collaborate. The gap between rural and urban communities in Indonesia must be narrowed, so that ICT mastery can be evenly distributed throughout Indonesia. The results of the study have shown the benefits of ICT in learning, namely: 1. It makes it easier for teachers and students to find alternative learning resources; 2. Clarify the subject matter

given by the teacher; 3. Learn more efficiently; 4. The insight of teachers and students increases; 5. Learning follows developments (Syahputra, 2018), The majority of Indonesian people use the internet to open social networking sites (73.30%). Then research on the Digital Landscape in Indonesia in 2017 by the organization We Are Social (2017) shows that with a total population of 265.4 million people, Indonesia is a potential market for internet users. The number of mobile phone users is 177.9 million people, as many as 132.7 million people are internet users, 130 million people actively use social media, and 120 million people use cellphones in social media. Utilization of the internet for education is one form of implementation of the fourth industrial revolution whose characteristics include digital technology and scientific interconnection (Nordin & Norman, 2017).

The researcher chose the teacher as the object of study in the use of ICT. Because even though the learning paradigm is now student-centered and turned into a transformational process, the teacher's role is still vital. Teachers are part of education providers, participants in curriculum development, as well as main implementers of the curriculum (Ornstein & Hunkins, 2013; Theodorou, Philippou & Kontovourki, 2017). One of the qualities of teachers is demonstrated by mastering the four competencies according to Law No. 14 of 2005 concerning Teachers and Lecturers (Yanuarti & Rusman, 2018). The ability to use ICT for learning is inherent in the pedagogic, professional, social, and personality competencies of teachers. The limitations and challenges in teaching in the 3T area certainly make the teacher's task even more difficult. Given the potential of ICT for education, and the crucial ability of teachers to utilize ICT, research to obtain an overview of the use of ICT by teachers in USO schools is not only interesting but also important to do.

## **METHOD**

The research design that studied was using a quantitative research design. The systematic investigation of phenomena through collecting measurable data and then performing statistical, mathematical, or computational techniques is called quantitative research. With the research, researchers used questionnaires as research instruments as well as data collection based on questionnaires distributed to respondents which was used as the main instrument for learning.

In this study, researchers selected research respondents according to the Convenience Sampling Procedure. Based on Cresswell (2014), the Convenience Sampling Procedure is a quantitative procedure in which researchers select participants because of their willingness and availability to be studied. Even though the population of primary school teachers in Indonesia is quite large, this research is specifically aimed at elementary school teachers in some areas including Bandung, Bangka, Bogor and Banten. Therefore, this study involved 30 teachers who teach in the high class. Respondents consisted of 7 men and 23 women. Their ages ranged from 21-60 years. Respondents also varied from their academic qualifications (from diploma to PhD level), teaching experience and formal training on ICT. About 56.7% of respondents were considered to be novice teachers (teaching experience for 1-3 years) while another 43.3% were considered as an experienced teacher (teaching more than 10 years). For academic qualifications, 100% of respondents have at least a Bachelor's degree. In this study, 66.7% of respondents came from the Banten area, 20% came from the Bangka area, 10% came from the Bandung area and 3.3% came from the Bogor area.

The survey method was accompanied to collect data on ICT adoption of elementary school teachers in high grades. The data collection instrument is a questionnaire which was adopted and adapted from Shah & Empungan (2015). The questionnaire was conducted online using Google Form. Online questionnaires are time efficient and able to reach a wider range of targeted respondents (Evans & Mathur, 2005).

The questionnaire is divided into three parts. The first section asks about demographic features such as gender, highest qualification, number of years of teaching. School area and professional development courses in ICT. There are 7 statements in a five-point Likert Scale format where 1 represents “Strongly disagree”, 2 represents “Disagree”, 3 represents “Neutral”, 4 represents “Agree” and 5 represents “Strongly agree”. The last section contains 7 statements regarding challenges or problems in using ICT tools in Primary Classes faced by respondents represented by a five-point Likert scale starting from 1 representing "Strongly disagree", 2 representing "Disagree", 3 representing "Neutral", 4 represents "Agree" and 5 represents "Strongly agree".

Data collected through questionnaires were analyzed using Statistical Package Social Science (SPSS). Descriptive statistics were used in the analysis to collect frequency, mean, percentage and standard deviation. The results are presented in the following sections. The data was then tested for reliability using Cronbach Alpha through SPSS. Table 1 shows Cronbach's Alpha values for each part of the instrument.

## RESULTS AND DISCUSSION

As shown in Table 2, 76.7% of the respondents were female teachers and 23.3% of Table 2 shows the findings for the demographic profile of the respondents. respondents are male and female teachers who have a Bachelor's degree. As for teaching experience, about 56.7% of respondents are considered novice teachers (teaching experience for 1-3 years) while the other 43.3% are considered experienced teachers (teaching more than 10 years). For teaching areas, there are 66.7% of respondents from the Banten area, 20% from the Bangka area, 10% from the Bandung area and 3.3% from the Bogor area.

Table 1. Shows Cronbach's Alpha value of each part in the instrument

No.	Part/Variable	Number of items	Cronbach's Alpha (α)
1.	Demographic Profile	6	-
2.	Distribution, Frequency and Average Attitudes towards ICT	7	0.653
3.	Distribution, frequency and average of challenges or problems in the use of ICT tools in Class	7	0.435

Table 2 Demographic Profile of Respondents

	Item	Frequency (presentation)
Gender	Male	7(23,3)
	Female	23(76,7)
Highest Qualification	Diploma	0
	Bachelor's Degree	30(100)
	Master's Degree	0
	PhD	0
Teaching Experience	1 – 3 years	17( 56,7)
	10 years and over	13(43,3)
from	Bandung	3(10)
	Bangka	6(20)
	Banten	20(66,7)
	Bogor	1(3,3)

### Teachers' Attitudes towards the use of ICT in high grades

Table 3 is to answer the first research question: What are the attitudes of teachers towards the use of ICT in high grades? Each item is rated from Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. Table 2 presents the results among respondents on the use of ICT in high grades.

Table 3. Distribution, Frequency and Average Attitudes towards ICT.

No	Item	STS %	SS %	N %	S %	TS %	Mean	SD
1.	I feel comfortable using ICT (google classroom, zoom meeting/google meet, PPT, WA/Video, etc.) as a tool in teaching and learning.	0 (0)	7 (23.3)	7 (23.3)	15 (50)	1 (3,3)	3.93	0.78
2.	Use of ICT (google classroom, zoom meeting/google meet, PPT, WA/Video, etc.) teaching all subjects stresses me out	6 (20)	0 (0)	7 (23.3)	1 (3,3)	16 (53.3)	2.10	0.75
3.	Using ICT tools will change the way I teach	0 (0)	9 (30)	2 (6.7)	17 (56.7)	2 (6.7)	4.10	0.83
4.	ICT helps students understand concepts in more effective ways	0 (0)	8 (26.7)	4 (13.3)	16 (53.3)	2 (6.7)	4.00	0.83
5.	ICT tools help teachers teach in a more effective way	0 (0)	12 (40)	3 (10)	11 (36.7)	4 (13.3)	4.03	1.03
6.	ICT tools help me save time and effort in my lesson planning	0 (0)	11 (36.7)	2 (6.7)	13 (43.3)	4 (13.3)	4.03	0.99
7.	ICT helps me modify learning to make it more interesting	0 (0)	13 (43.3)	2 (6.7)	15 (50)	0 (0)	4.36	0.61

As shown in Table 3, the majority of respondents (50%) agree that ICT helps to modify learning to make it more interesting because it shows value highest mean ( $M = 4.36$   $SD = 0.61$ ). Item 3 also shows the highest mean score ( $M = 4.10$   $SD = 0.83$ ) where 56.7% of respondents agree that using ICT tools will change the way they teach. Based on item 6, 43.3% of respondents also agree that ICT tools help them save time and effort in planning lessons because it shows the highest average score ( $M = 4.03$   $SD = 0.99$ ) Furthermore, 36.7% of respondents also agree that ICT tools help them teach in effective ways, item 1 shows 50% of respondents agree that they feel comfortable using ICT as a tool in teaching and learning. While item 2 shows the lowest average score ( $M = 2.10$   $SD = 0.75$ ) where many respondents who answered disagreed that the use of ICT to teach all subjects made them stressed.

### Challenges or Problems in Using ICT in Learning

Table 4 answers the second research question: What are the challenges or problems in using ICT tools in higher education? Each item is rated from Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree. Table 4 presents the results among respondents on the challenges or problems they encountered while using. So in conclusion, the results of the respondents of this study showed 50% of respondents stated

that ICT can help modify learning. As well as 56.7%, teachers also agree that using ICT tools will change the way teachers teach.

Table 4. Distribution, frequency and average of challenges or problems in the use of ICT devices in schools

No	Item	STS %	SS %	N %	S %	TS %	Mean	SD
1.	Not enough computers/ICT tools in my school	0 (0)	6 (20)	4 (13.3)	18 (60)	2 (6.7)	3.93	0.78
2.	Outdated/incompatible computers/ICT devices in my school	1 (3.4)	0 (0)	4 (13.3)	12 (40)	13 (43.3)	2.90	0.99
3.	Internet access is easily accessible at my school	1 (3.3)	10 (33.3)	2 (6.7)	15 (50)	2 (6.7)	4.03	0.99
4.	Internet access is difficult/not available at my school	9 (30)	1 (3.3)	3 (10)	1 (3.3)	16 (53.3)	1.96	0.92
5.	Not enough time to master new software or integrating ICT during class period	2 (6.7)	1 (3.3)	10 (33.3)	9 (30)	8 (26.7)	2.96	0.99
6.	Lack of time to prepare the lesson itself due to other administrative work	1 (3.3)	3 (10)	6 (20)	10 (33.3)	10 (33.3)	3.13	1.10
7.	Lack of training on computers/software available	1 (3.3)	5 (16.7)	2 (6.7)	17 (56.7)	5 (16.7)	3.66	1.06

Based on Table 4, it can be seen that in item 3, 50% of respondents can easily access the internet at their school by showing the highest average score ( $M = 4.03$   $SD = 0.99$ ). Furthermore, 60% of respondents agreed that there were not enough computers/ICT tools in schools to show an average score ( $M = 3.93$   $SD = 0.78$ ). Furthermore, 56.7% of respondents agree with the lack of available computer/software training with an average value ( $M = 3.66$   $SD = 1.06$ ).

Based on point 6 that the lack of time to prepare lessons because of administrative work, 33.3% of respondents answered agree and 33.3% of respondents answered disagree where the average value ( $M = 3.13$   $SD = 1.10$ ). Furthermore, 33.3% of respondents answered neutrally that there is not enough time to master new software or integrate ICT during the class period by indicating an average score ( $M = 2.96$   $SD = 0.99$ ). Item 2 shows that 43.3% of respondents disagree that computers/ICT tools are out of date/incompatible in their school by showing an average score ( $M = 2.90$   $SD = 0.99$ ). On the other hand, only 53.3% of respondents who stated that they disagreed that internet access was difficult/unavailable at their school was one of the challenges for them to use ICT in the classroom because it showed the lowest average score ( $M = 1.96$   $SD = 0.92$ ). In conclusion, the results of respondents from the challenges experienced by teachers stated that there was not enough time to master the new software, as well as the lack of time to

prepare the lesson itself because of other things administrative work, the results stated that 33.3% of respondents agreed.

The findings show that the teacher's attitude towards the use of ICT in the high class, the results of the respondents of this study showed 50% of respondents stated that ICT can help modify learning. As well as 56.7%, teachers also agree that using ICT tools will change the way teachers teach. And shows that the teacher's attitude is positive. In table 4, the challenges or problems faced by teachers in using ICT in high grades, states that there is not enough time to master the new software, as well as lack of time to prepare the lesson itself due to other things administrative work, the results state 33.3 % of respondents who agree.

These results are in line with the research conducted by Shah & Empungan (2015) regarding positive attitudes. Teachers in using ICT in this high class, lead more to the involvement and participation of students. The results of this study also show that most of the respondents have a positive attitude towards the use of ICT in high grades and it is hoped that students can be motivated to learn and be able to facilitate their own learning so that students are able to have competence in the 21st century era. Teachers also need to adjust teaching, to suit the needs of students so as not to cause problems in learning. In addition, one of the areas that is less discussed in this regard is how teachers can ensure that the use of ICT will be beneficial for students and not detrimental and can distract them especially with technological advances which can be fatal for students' learning speed as well.

The second part shows the challenges or problems faced by teachers in using ICT. The results show that the lack of teacher training on computers or available software is a barrier for those who want to learn or use ICT. This is in line with the research of Mahmud & Ismail (2010) where they discussed that teachers' knowledge of ICT leads to their attitude in using it in the classroom. It is also important for teachers to be provided with progressive training, especially with the many digital learning platforms, which were introduced especially during this COVID-19 pandemic, where learning is mostly done online. Teachers must have good computer and technology skills to cope with fast-paced online classes and courses. In addition, lack of time to prepare lessons due to other administrative work, lack of time to master new software or integrate ICT during class periods and lack of support from administrators or peers are also challenges faced by teachers. This finding is supported by research by Kandasamy & Shah (2013).

Teachers do not need to feel burdened by using ICT in their learning and should be given sufficient time for teachers to plan and manage their learning so that they can achieve the goals that have been set. The use of ICT in high grades will not work well if the teacher bears the burden alone. In addition, a survey questionnaire was used as an instrument in this study. Researcher future may wish to consider the use of other data collection instruments to collect in-depth information on teachers' attitudes towards the use of ICT in elementary schools and the challenges teachers face in using ICT in the high classroom. In addition, future researchers may wish to replicate this study by design mixed methods research to help researchers get in-depth information about teachers' attitudes towards the use of ICT in the classroom are high and the challenges that teachers encounter during the use of ICT in the classroom.

The finding was in line with the concept of education in the 21st century is also often referred to as 21st century learning (21st Century Learning) (Andrian & Rusman, 2019). According to Chuntala (2019), 21st century learning can be understood as learning aimed at providing 21st century skills, namely (1) Communication; (2) Collaboration; (3) critical thinking and problem solving; (4) creative and innovative. According to P21 in (Sukartono, 2018). 21st century learning places demands on students to acquire technological literacy, media literacy, and survival skills. 21st century learning is a solution in producing graduates who are ready to compete globally, it requires educators and students to master

one of the most important skills in the 21st century, namely being able to understand and use ICT (ICT Literacy Skills). The use of ICT in an educated, organized, integrated and planned manner) has undoubtedly facilitated teaching and learning activities in the classroom. Facilities carried out in learning mean not only: 1) Providing later in learning and teaching for teachers as well as students; 2) Making the explanations of various objects that are abstract into concrete; 3) Increase the use of time by teachers to carry out the teaching and learning process, including the provision of various explanations. Therefore, students are required to be more active. A student- or student-centered approach, teachers must be able to carry out their roles well, teachers must help students solve problems when students have difficulty in the learning process (Kurniawan, et al. 2018; Antika, 2014; Gantrisia, et al, 2018; Kristiawan, et al., 2021). In accordance with 21st century learning, one of which relates to the use of technology 21st century learning applies learning & innovation skills, information skills, media and technology (digital literacy), especially to educators.

Finally, it is also recommended that further studies on the use of used in learning can also be done to help researchers measure which tools teachers prefer in their teaching and its relevance and how it can further improve students. learning. Important to see the impact of the tools used whether it leads to better learning positive for students or not. Conflict of interest The authors declare there is no conflict of interest regarding publication of this paper.

## CONCLUSION

This research study investigates teachers' attitudes towards ICT and the problems and the challenges that teachers encounter during the use of ICT in high grades. This study found that most of the respondents showed a positive attitude towards the use of ICT. As a suggestion, more training on computers or software that available can be done to meet the needs of our current teachers in high grade. Besides that, the workload of teachers, especially on administrative work, can be reduced so that teachers will have more time to properly prepare for their lessons besides master the new software available. It is also to give more time for teachers who are not well equipped with the use of ICT to equip yourself with the required skills. In addition, administrators must also play a large role in supporting the use of ICT in the high class.

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