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The influence of teachers' ICT competence on children's digital literacy abilities

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Abstract: The use of digital devices in the learning process is intended to provide convenience for teachers in presenting quality learning for children. Therefore, digital literacy is very much needed by teachers and prospective teachers in order to optimize children's development. This study uses a quantitative research design. The population in this study amounted to 9 respondents from various areas of Surabaya, while the sample in this study was obtained by 45 respondents with the research subjects being kindergarten teachers in the Surabaya area. The sampling technique used was purposive sampling. The data analysis technique used cluster sampling technique. The overall research results show that teacher ICT competence has an effect on children's digital literacy skills, which shows that the variable X teacher ICT competence has a t count of 2.654, which means it is greater than the t table which is 2.01669, and a significant value of 0.011 is smaller than 0.05. So it can be concluded that H1 is accepted so that variable X has a significant effect on variable Y, namely children's digital literacy skills. These results are also supported by the conformity of the results on each question item covering teacher competence in using digital devices in their learning. With the presence of digital devices as a learning resource, it produces children's ability to learn independently and teach children to utilize digital devices to improve knowledge and skills according to their age.

Keywords: *Digital literacy, ICT competence, Teachers.*

1. Introduction

The application of information and communication technology for children offers various learning opportunities in interesting and different ways [1]. Educators are expected to be wise in utilizing and implementing information and communication technology as a supporting learning resource, not only that, educators must remember that children have a golden age where they need learning by adjusting their needs and interacting directly.

According to the explanation that in the application of information and communication technology, educators are expected to be able to provide various interactive activities that can encourage children to reflect on the learning experiences they have gained. Mastery of technology in learning has become a must for an educator because educators in the digital era must be able to operate technology that can be used as information and communication tools [2].

In the midst of the issue of pros and cons of implementing information and communication technology in the world of education, the wise thing to do for educators at school and at home is to find solutions on how to utilize the advantages of information and communication technology for the purpose of achieving the planned education for children. Learning information and communication technology in early childhood has many perceptions, including the use of ICT as a learning medium [3]. Information and communication technology has two different sides, namely positive and negative sides, so the implementation is different for each child's development [4].

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Teacher competence is expected to be able to adapt learning strategies to various changes and applicable policies so that children continue to receive appropriate educational services [5]. To support teacher competence in the early childhood category, the use of digitalization in the learning process is intended to provide convenience in presenting quality learning to children [6]. Therefore, digital literacy is very necessary in optimizing the development of early childhood [7].

Digital literacy is the knowledge and skills in applying digital media, communication tools or networks in creating information, finding and utilizing it according to needs [8]. Digital literacy can also be defined as an individual's ability to apply functional skills to digital devices so that children can find information, think critically, collaborate, and communicate effectively while maintaining electronic security in a social context [9].

The role of digital literacy can enable teachers and students to communicate effectively even though the learning that is implemented is not carried out directly. Then the influence of teacher competence in digital literacy skills on children's education is to make teachers as facilitators not only utilize learning resources in the school environment but also from various other sources to optimize the development and growth of children [10].

Teacher competence is expected to be able to adjust learning strategies to situations and conditions as explained above, that teachers are expected to adapt quickly to various changes and policies in force, in order to obtain educational services so that learning objectives are achieved optimally.

The use of digitalization in the learning process is intended to make it easier for teachers to provide quality learning for children [11, 12]. Therefore, digital literacy is very necessary for teachers and prospective teachers to optimize children's development [13]. Besides that, literacy skills are important skills that must be achieved before reaching the school entry phase.

Strengthening digital literacy for teacher competency is intended so that teachers have the ability to utilize digital media to help improve their competency as teachers or educators. Strengthening digital literacy through literacy training shows significant benefits through skills in processing digital information sources and evaluating information and communication technology.

The role of digital literacy can make teachers and students communicate effectively even though they do not meet face to face. Building digital literacy which includes information literacy and computer technology literacy is aimed at improving the quality of human resources that are competitive in the 21st century. The purpose of digital literacy is; (a) to know and care about the importance of information and the use of technology in everyday life, (b) to have experience in using information and communication technology as an important component in solving problems; (c) to improve the performance of daily activities significantly and measurably through the use of information and communication technology.

2. Method

This study used a quantitative research method with a comparative causal design. This research method is used to state whether or not there is an influence of teacher ICT competence (X) which is an independent variable (influencing variable), on children's digital literacy skills (Y) which is a dependent variable (influenced variable). This study was analyzed using descriptive and inferential statistical techniques. This study was conducted in educational institutions in the Surabaya area.

Population is the total number of targets in a study. This is in line with the explanation that population is "a generalization area consisting of objects or subjects that have certain characteristics and qualities that are determined by researchers to be studied and then conclusions are drawn. This study uses cluster sampling technique, a probability sampling technique where researchers divide the population into several groups (clusters) for research. This study involved a population of 45 teachers as part of the research respondents.

Research instruments are tools to measure natural and social phenomena. This study uses an instrument in the form of a questionnaire or survey that will be distributed to kindergarten teachers in

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the Surabaya area. The research instrument in the form of a questionnaire uses a Likert Scale with four alternative answers.

The validity of this research instrument was tested on 25 teachers in Surabaya. The validity test of the instrument can be done using the product moment correlation technique through the SPSS 23.0 for windows program. While the reliability test is a series of measurements that are intended to measure the consistency of the research instrument. This study uses the Cronbach alpha formula.

The process of data analysis or processing includes grouping data based on variables and respondents, tabulating data, processing data to find answers to the problem formulation and testing the proposed hypothesis. This study uses descriptive statistical analysis techniques and inferential statistics.

3. Results and Discussion

3.1. Results

Primary data was obtained by distributing questionnaires in the form of questionnaires directly to 45 respondents after first providing an explanation to the teachers. The questionnaire contains 29 questions. Consisting of 9 questions for the teacher's ICT competency variable and 20 questions for the child's digital literacy ability variable. Teachers are given the freedom to answer by choosing the answer interval that has been provided.

The analysis of respondent characteristics consists of; (a) Gender that all respondents in this study were female (100%).; (b) Age that most respondents were under 30 years old (60%), the rest were 30-35 years old (26.7%) and 36-40 years old (13.3%); and education level that most respondents had a Bachelor's/Bachelor's degree (86.7%), the rest were D-III/D-IV (4.4%) and S2/Masters (8.9%).

Furthermore, regarding the frequency analysis of respondents' answers, the X variable (Teacher ICT Competence) is categorized as follows:

Table 1.

Variabel	Item	SS		S		TS		STS		Mean
		f	%	f	%	F	%	f	%	
Teacher ICT competence	X1	30	66.7	15	33.3	0	0	0	0	3.67
	X2	27	60	18	40	0	0	0	0	3.60
	X3	20	44.4	25	55.6	0	0	0	0	3.44
	X4	21	46.7	23	51.1	1	2.2	0	0	3.44
	X5	24	53.3	20	44.4	1	2.2	0	0	3.51
	X6	22	48.9	23	51.1	0	0	0	0	3.49
	X7	20	44.4	24	53.3	1	2.2	0	0	3.40
	X8	20	44.4	25	55.6	0	0	0	0	3.44
	X9	27	60	17	37.8	1	2.2	0	0	3.58

Based on the table above, it can be concluded that most teachers know the types of learning software/applications. While the lowest average is in question item number 7 related to "taking online training or seminars to improve my professional competence as a kindergarten teacher" amounting to 3.40. This means that most teachers have not taken online training or seminars to improve their professional competence.

Meanwhile, the results of variable Y (Children's Digital Literacy Skills) are described as follows:

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Table 2.

Variabel	Item	SS		SS		TS		STS		Mean
		f	%	F	%	f	%	f	%	
Children's digital literacy abilities	Y1	32	71.1	13	28.9	0	0	0	0	3.71
	Y2	28	62.2	17	37.8	0	0	0	0	3.62
	Y3	22	48.9	23	51.1	0	0	0	0	3.49
	Y4	21	46.7	24	53.3	0	0	0	0	3.47
	Y5	24	53.3	21	46.7	0	0	0	0	3.53
	Y6	18	40	27	60	0	0	0	0	3.40
	Y7	19	42.2	26	57.8	0	0	0	0	3.42
	Y8	16	35.6	26	57.8	3	6.7	0	0	3.29
	Y9	15	33.3	30	66.7	0	0	0	0	3.33
	Y10	18	40	27	60	0	0	0	0	3.40
	Y11	28	62.2	17	37.8	0	0	0	0	3.62
	Y12	24	53.3	21	46.7	0	0	0	0	3.53
	Y13	16	35.6	29	64.4	0	0	0	0	3.36
	Y14	16	35.6	29	64.4	0	0	0	0	3.36
	Y15	18	40	26	57.8	0	0	1	2.2	3.36
	Y16	19	42.2	26	57.8	0	0	0	0	3.42
	Y17	14	31.1	26	57.8	5	11.1	0	0	3.20
	Y18	9	20	35	77.8	1	2.2	0	0	3.18
	Y19	26	57.8	19	42.2	0	0	0	0	3.58
	Y20	26	57.8	19	42.2	0	0	0	0	3.58

Based on the results of the Y variable, it can be concluded that most children have known digital devices such as computers, laptops, smartphones, and tablets. While the lowest average is in question item number 18 related to "understanding and following ethical rules in using digital devices, such as not bullying or behaving negatively online" amounting to 3.18. This means that most children still do not understand and follow ethical rules in using digital devices, such as not bullying or behaving negatively online. Thus, parental guidance is needed regarding this matter.

Table 3.

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	45.393	8.817		5.148	0.000
	Variabel_X	0.738	0.278	0.375	2.654	0.011

3.2. Hypothesis Test Results

These results indicate that Variable_X has a significant positive effect on the dependent variable. A positive Beta value indicates that as Variable_X increases, the dependent variable also increases. Statistical significance (p-value < 0.05) supports the rejection of the null hypothesis, indicating a meaningful relationship between the independent and dependent variables.

4. Discussion

Currently, the world is in the era of revolution 4.0 where the development of information and communication technology (ICT) is growing very rapidly, this condition is able to bring about changes in all aspects of life such as social, economy, as well as educational aspects [14-16]. In the aspect of education, education implementers are faced with the characteristics of students who are currently dependent on technology. This demands changes in the learning aspect known as 21st century learning.

In 21st century learning, the characteristics of students are utilizing ICT in learning to increase knowledge, this is because the skills of using ICT are the ability to increase creativity, critical thinking, communication, collaboration and problem solving. In responding to these challenges, teachers are required to no longer use classical learning methods such as using a blackboard at the front of the class,

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but must be skilled in carrying out ICT-based learning that supports the achievement of 21st century student competencies [17].

The presence of digital technology needs to be accompanied by knowledge and understanding related to the use of digital technology from the perspective of teachers, parents and children [18]. Teachers are the main factor in determining the success or failure of improving the quality and innovation of education at the school level, especially in early childhood education [19]. The role of teachers in PAUD must be able to adapt learning strategies to the current situation and conditions as explained by that teachers in PAUD must quickly adapt to various changes and applicable policies in order to achieve optimal learning for children.

Based on the results of descriptive analysis, 100% of the respondents (45 people) were female in the Surabaya Kindergarten. The age classification of the educators was 27 people (60%) under 30 years old, the rest 12 people were 30-35 years old (26.7%) and 6 people were 36-40 years old (13.3%). Furthermore, the results of the distribution of the education level of the educators were that most of them had S1/Bachelor degrees totaling 39 people (86.7%), the rest had S2/Masters totaling 4 people (8.9%) and D-III/D-IV totaling 2 people (4.4%).

Teacher competence is related to the nature and responsibility of a teacher in improving skills, knowledge and behavior to be actualized in carrying out their professional duties [20]. These competencies include professional, pedagogical, personality and social competencies, one of the indicators of teacher competency is Information and Communication Technology (ICT) competency [21]. Teacher ICT competence is an ability to develop learning innovations by utilizing ICT in planning and evaluating learning.

Based on the results of the study, it shows that the efforts of ICT competence of teachers are very high in participating in learning related to types of software and the use of learning applications that will later be applied in the classroom, the percentage in activities shows the highest average of 3.67. While the lowest average related to participating in online training or seminars shows the number of 3.40, this explains that each teacher has obstacles related to their participation in seminar activities that are carried out online..

The existence of digital devices that are not balanced with a culture of literacy from the closest environment and guidance from adults can also cause negative impacts in all aspects such as lack of interaction between each other, bullying peers, negative behavior and so on. The research results show that an average of 3.18 children of early age do not understand the ethical rules in digital use, meaning that most children are not fully accompanied and supervised by their parents in using digital devices.

5. Conclusion

Teacher competence is the essence and responsibility of a teacher in improving skills, knowledge and behavior to be actualized in carrying out their professional duties. These competencies include professional, pedagogical, personality, and social competencies, one indicator of teacher competence is Information and Communication Technology (ICT) competency.

Determination of teacher ICT competency as one of the logical consequences of the large positive influence of ICT on educational activities, including accelerating teacher access to various learning resources, accelerating teacher administration activities, helping teachers explain abstract materials so that they are easily understood by students. Thus, as teachers, it is expected to have the ability to integrate the use of ICT in learning and be supported by digital literacy so that students can more easily access digital-based learning.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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