The Impact of Implementing the IPOSACE Model on Improving the Digital Literacy Competence of Elementary School Teachers

Sri Marmoah, Jenny Indrastoeti Siti Poerwanti, Suharno

Faculty of Teacher Training and Education, Sebelas Maret University,
Faculty of Teacher Training and Education, Sebelas Maret University, Faculty of Teacher Training and Education, Sebelas Maret University,

marmuah@staff.uns.ac.id, jenny_isp@staff.uns.ac.id, suharno.52@gmail.com

Abstract. The digital literacy competence of teachers must be considered and continuously improved. Therefore, the IPOSACE quality management model used by elementary school teachers in the process of improving the quality of education can provide a positive side for teachers. This study aims to determine the impact of the IPOSACE model's application on improving elementary school teachers' digital literacy competence. The research method used is qualitative research. The research subjects were teachers in elementary schools in Simo District, Boyolali Regency, Indonesia. Research data collection techniques through questionnaires, interviews, and observations. The data analysis technique used is the Miles and Hubarman technique, namely data reduction, data presentation, and conclusion. The results of research showed that the application of the IPOSACE model could improve the digital literacy skills of elementary school teachers in elementary schools throughout Simo District, Boyolali Regency, Indonesia. Model IPOSACE dilakukan dalam menjalankan program pelatihan literasi digital guru, mulai dari tahap mengidentifikasi, merencanakan, mengorganisir, menyusun staf, menggerakkan, mengendalikan, dan mengevaluasi program. The results of the study revealed that there was an increase in the teacher's digital literacy score from 2.49 in the medium category to 4 in the high category.

Keywords: Impact, IPOSACE Model, Digital Literacy Competence

1   Introduction

The literacy movement is one of the movements engaged in education that seeks to grow a character with a mission so that students and teachers in Indonesia have good reading and writing culture so that meaningful and lifelong learning is formed. The background of this movement is the state of Indonesia as a country where people with reading emergencies are feared to be worried about the future. Therefore, this literacy movement is a step for schools as facilitators must optimally organize various activities,

one of which is the implementation of the compulsory reading program for 15 minutes before the lesson begins. In addition, it can also be done by doing physical activities such as gymnastics which is held regularly every week at certain times and is followed by all school residents [1]. Literacy culture in Indonesia is still very low, especially at the elementary school level. The results of a survey conducted by Central Connecticut State University showed that our country was ranked 64th out of 72 INAP participating countries and included in the poor category and 60th out of 61 countries that got PISA scores. The current population reading index is only 0.00, meaning there is no minimum achievement and no progress compared to other countries. The impact of this low literacy culture has resulted in the rapid spread of hoax news to others. Data in 2016 found cases of crime in cyberspace with a total of approximately 1207 cases in the form of contamination of good news, fake news, fraud, and various other cyber crimes [2].

In this case, the government took the initiative to form a policy that could overcome the low interest in reading among students through a program called the School Literacy Movement (GLS). There are various kinds of literacy skills that need to be mastered by teachers, some of which are digital literacy. One of the important digital literacy skills to have today is digital literacy skills. Digital literacy can be defined as the ability of individuals to understand and use computer devices to access various information in various formats from various sources in the digital space to build new knowledge so that they can actively participate in society effectively [3], [4]. Digital literacy is not only related to a person's ability to use technology, but also relates to his ability to utilize technology and digital media to produce, share, and consume digital media content selectively and critically there are seven elements of digital literacy [5].

Some problems occur in the Simo Boyolali Elementary School area related to the low competence of digital literacy teachers. Based on the results of interviews, teachers have not been able to fully operate a learning application in the classroom. Teachers tend to be limited to just using it without paying attention to how to solve problems or optimize the use of application features. Teachers in making teaching materials are still conventional so digitization is still difficult to do. Teachers tend to use certain ready-made software so that the material is just like that and attached to the program that runs in it without any creation from the teacher to develop it further. With this treatment, of course, the longer the students will be bored with the learning process. When they are bored, their concentration will be disturbed by other things passing through their mind. This incident can result in the process of receiving material by students being slow and incomplete and hindering the process of growing a literacy culture.

A research study conducted by Siti Masitoh in 2018 related to blended learning with a digital literacy perspective, shows that the research results highlight advances in technology and informatics that open opportunities for the entire world population, including Indonesia, to take advantage of electronics and digital products [2]. In addition to these problems, the low digital literacy competence of teachers can be seen in researchLestari et al. (2020), stated that the digital literacy level of elementary school teachers in Bogor City was classified as medium in all aspects of competence, both in the internet search aspect, hypertextual navigation aspect, content evaluation aspect, and knowledge assembly aspect [6]. Second, research on efforts to improve digital literacy skills reveals that information literacy training provides significant benefits for

improving the information literacy skills of teachers and school library staff as well as students in the school environment [7]. Third, research conducted by the Network of Digital Literacy Activists suggests that digital literacy actors in schools are only 3.68%, which shows that the ability of digital literacy actors in schools is still low [8].

Based on the digital literacy problems of teachers above, it is necessary to implement an education quality management model to improve digital literacy skills. One of the education quality management models used is the IPOSACE model. The IPOSACE model is a quality management model that the researcher developed which includes identifying, planning, organizing, staffing, actuating, controlling, and evaluating. The IPOSACE model was developed from the POAC quality management model. This model is needed as a procedure for implementing the model in increasing digital literacy.

The novelty in this study with previous research is the analysis of digital literacy carried out on teachers using the IPOSACE model to find out the various impacts. Based on the problems above, this research aims to determine the impact of the IPOSACE model on teachers' digital literacy competencies.

2   Method

The research method used is a qualitative research approach with descriptive study methods. Descriptive research is a study that asks for events or occurrences of variable distribution by describing it without changing the variable [12]. Descriptive qualitative research is closely related to naturalistic or natural, so this research will measure events that have occurred without any prior conditioning. Qualitative research has a plan in analyzing the event in question by revealing the meaning of the event in detail [9]. According to Johnson (2007) [10], qualitative research is research that relies on data collection. The research subjects were headmasters and teachers at SDN in Simo District. Research data collection techniques through questionnaires, interviews, and observations. The data analysis technique used is the Miles and Hubarman technique, namely data reduction, data display, and conclusion [11]. Teacher digital literacy instrument adopted from Paul Gilster [12]. The digital literacy questionnaire instrument uses a Likert scale from 1-5. The following is a grid of teachers' digital literacy instruments:

Table 1. Grid of Teachers' Digital Literacy Instruments

No	Indicator		Sub-indicator
1	*Internet Search*	a.	the ability of web search
		b.	the capability for searching information on the internet
		c.	activity in using the internet
2	*Hypertextual Navigation*	a.	the capability for understanding hypertext and hyperlink
		b.	the capability for understanding the characteristics of hypertext
		c.	the capability for understanding differences in information on the internet with textbooks
		d.	the capability for understanding how the web works
		e.	the capability for understanding the characteristics of web pages
3	*Content Evaluation*	a.	the capability to distinguish display from the information content
		b.	the capability for analyzing background information
		c.	the capability to analyze web pages
		d.	the ability to function and use the FAQ in discussion groups
4	*Knowledge Assembly*	a.	the ability to arrange teaching materials by joining a newsgroup/mailing list/group discussion
		b.	ability to analyze background information obtained
		c.	Capability to use several types of media to prove the truth related to information that has been obtained
		d.	Capability to conduct discussions to solve problems and compile teaching materials
		e.	the ability to compile sources of information obtained to compile teaching materials

Source: Gilster (1997)

IPOSACE's model questionnaire uses the Guttman scale, if the answer is "Yes" it is worth 1, if the answer is "No" it is worth 0. This questionnaire is modified by Rasmi (2016) [13].

Table 2. IPOSACE Model Instrument Grid

No.	IPOSACE Variable	Questionnaire No.	Statement
1	*Identifying*	1	Already installed a wifi network at your school
		2	Teacher readiness in online learning
		3	There is readiness, willingness, and ability of teachers in online learning
		4	The readiness of students to take part in online learning.
		5	Does every student already have a device?
		6	Is the signal outside the classroom very supportive
		7	The socio-economic conditions of the parents of students are on average good
		8	There is community/parent concern in learning
		9	Dinas (Government) provides leeway 'policy' on online learning
		10	There is hope for every parent so that their child can achieve maximum achievement
2	*Planning,*	11	Planning socialization activities related to digital literacy skills training by teachers
		12	Planning digital literacy skills training activities
		13	Selecting and assigning teachers to the training
		14	Determine the facilities that support the training
		15	Selecting and assigning relevant resource persons
		16	Develop a ground role in the training
		17	Develop and align the flow of training implementation
		18	Prepare various reference sources for the development of these activities
3	*Organizing,*	19	There is coordination with both educators, education staff, and related supporting facilities
		20	Forming flexible relationships between participants makes it easier to communicate in groups
		21	Prepare menus or digital literacy training materials

No.	IPOSACE Variable	Questionnaire No.	Statement
		22	Maximizing the sources of information that can be accessed in learning
		23.	There is good coordination between schools and education staff in the implementation of related programs
		24	Establish communication relationships between education staff and parents of students
4	*Staffing,*	25	Preparing educators with qualifications willing and able about digital literacy
		26	Selecting and appointing education personnel who are willing to assist in related training activities
		27	Ready to guide educators and education staff in the development of these activities
		28	Providing rewards for educators who excel and progress
5	*Actuating,*	29	Dynamically implementing the online learning process for teachers, from curriculum breakdown, syllabus, lesson plans, development of teaching materials, assessment plans, and remedial
		30	Provide or use the applicable learning implementation format
		31	Provide opportunities (freedom) in choosing and using methods, media, and the development of teaching materials
		32	Providing flexible and proportional KKM signs
		33	Provide and use digital learning media such as e-books as a form of digital literacy
		34	Providing a platform that supports digital literacy activities
		35	Using various online learning resources to increase digital literacy
6	*Controlling*	36	Monitor the implementation of online learning for teachers, from planning, implementation,

No.	IPOSACE Variable	Questionnaire No.	Statement
			and assessment so that there are no deviations from the corridor.
		37	Provide direction in the implementation of online learning activities
		38	Provide guidance for teachers and education personnel who deviate from the established corridor
		39	Provide opportunities for teachers and education personnel to improve themselves, to achieve the desired learning outcomes
		40	Provide an assessment for teachers and education personnel in the implementation of online learning by implementing digital literacy
7	*Evaluating,*	41	Evaluating the entire online learning process, from how teachers plan, implement, and assess learning outcomes.
		42	Provide and or use a good and correct online learning process assessment format
		43	Organizing a joint discussion forum to discuss the evaluation results
		44	Conduct performance comparisons before and after the implementation of related programs
		45	Follow up and improve together the inputs from the forum for future improvements.

Data interviews and observations were used to strengthen the questionnaire data. Points in interviews and observations are similar to questionnaires.

3   Results and Discussion

3.1   Results of digital literacy skills before IPOSACE implementation

Table 3. Results of Teacher Digital Literacy Competence Before the Implementation of the IPOSACE Model

No	Indicator	Score Mean	Category
1	*Internet Search*	3.01	High
2	*Hypertextual Navigation*	2.23	Middle
3	*Content Evaluation*	2.24	Middle
4	*Knowledge Assembly*	2.47	Middle
	Overall average	2.49	Middle

Description of the mean score:
0.00 – 1.00 = Very Low
1.01 – 2.00 = Low
2.01 – 3.00 = Middle
3.01 – 4.00 = High
4.01 – 5.00 = Very High
Source: Sujana in Landa (2021) [14]

Based on the results of the research in table 3 regarding the digital literacy competence of teachers before the implementation of the IPOSACE model, an average score of 2.49 was obtained in the medium category. The highest score was obtained on the internet searching indicator with a score of 3.01 while the lowest score was obtained on the Hypertextual Navigation indicator with a score of 2.23. The internet searching indicator means the ability to use the internet and various other activities on it. These competencies include searching for information in digital media, using search engines, and carrying out activities in them [15]. This means that elementary school teachers in Simo District are already at a high level or good at internet searching indicators. Based on the results of observations and interviews, teachers can find information on search engines such as Google and Mozilla Firefox. The activities carried out by the teacher on the search engine are looking for learning resources, learning media, and teaching references. Hypertextual navigation indicators are skills in reading and understanding dynamically the hypertext environment on digital media. These competencies include the ability to know about hypertext and hyperlinks and how they work, the difference between reading a textbook and browsing via digital media, knowledge of how the web works including knowledge of bandwidth, HTTP, HTML, and URL, as well as the ability to understand the characteristics of web pages [16]. Based on this understanding, it means that the digital literacy ability of teachers in Simo District in the Hypertextual Navigation indicator is still in the medium (not high) category. The medium category in the digital literacy indicator is also obtained from the content evaluation and knowledge assembly indicators. Based on the results of observations and interviews, teachers have not been able to distinguish each characteristic of the web according to their field. Teachers only use keywords in search engines and don't pay attention to hypertext and hyperlinks and how they work

The results of this research follow previous research, which was conducted by Lestari et al. (2020), which stated that the digital literacy level of elementary school

teachers in Bogor City was classified as intermediate in terms of competence aspects of hypertextual navigation, content evaluation aspects, and knowledge assembly aspects. The thing that sets it apart is the internet search aspect. The research conducted by Lestari is in the medium stage while the research that has been carried out is in the high category. Based on the results of interviews and observations, the results of research at Simo Elementary School are because teachers have often used Google applications and other search engines but have not been able to critically analyze content in digital media. Therefore, based on the results of measuring digital literacy competencies, it is necessary to apply an Education quality management model to improve digital literacy competencies, one of which is by applying the IPOSACE model.

3.2   The results of implementing IPOSACE

Table 4. Results of Analysis of the Implementation of the IPOSACE Model in SD

No	Aspect	Average score obtained	Category
1	Identifying	0.7	High
2	Planning	0.6	Middle
3	Organizing	0.8	High
4	Staffing	0.8	High
5	Actuating	0.79	High
6	Controlling	0.90	Very High
7	Evaluating	0.80	High
	Total	0.77	High

Description of the mean score:
0.00 – 0.20 = Very Low
0.31 – 0.40 = Low
0.41 – 0.60 = Middle
0.61 – 0.80 = High
0.81 – 1.00 = Very High

Based on the results of the data in table 4 regarding the results of the analysis of the implementation of the IPOSACE model in elementary schools in Simo District, the average result of the implementation of the IPOSACE model in elementary schools in Simo District is in the high category with a score of 0.77. The very high category in the application of the model is obtained by the controlling aspect. The controlling aspect is an aspect of controlling the implementation of the program and supervising the program if it is not appropriate. The principal's role is to be able to coordinate groups, materials, programs, and reports related to schools and teachers in learning, especially online learning that involves the use of technology. Controlling is the activity of controlling the implementation of school programs and correcting if the activities carried out deviate from the initial plan [17]. There are four kinds of roles of an education supervisor or supervisor, namely: group leader, coordinator, consultant, and evaluator. Supervisors

have to coordinate materials, groups, programs, and reports related to schools and teachers. Supervisors have to act as consultants in curriculum development, learning technology, school management, and staff development. Furthermore, the aspects that get a high category are identifying, organizing, staffing, actuating, and evaluating aspects. Based on the results of interviews and observations, the implementation of the iposace model in schools is as follows:

First, the identifying aspect is the stage to determine the needs of the program's internal and external customers. This step can be done by identifying/analyzing the external and internal environment to find tactics and strategic problems as material in the needs analysis in compiling a program of teacher activities. In the world of education, there are two education customers, namely internal customers, and external customers. internal customers, namely principals, stakeholders, teachers, and employees [18]. In educational institutions, environmental analysis can be done using the Strength, Weakness, Opportunities, and Threats (SWOT) analysis of the organization/institution that will carry out the education quality management function to improve digital literacy. The organizing aspect is the activity of distributing tasks to teachers as human resources in schools by the capabilities of each teacher. After deciding on the division of tasks, the principal must organize it so that the program, in this case, the school's digital literacy, can work effectively and efficiently. So, organizing means completing the program that has been prepared with an organizational structure so that its implementation can achieve maximum results [19]. Then, Staffing is an activity of selecting, selecting, and coordinating all potential resources (teachers) so that their implementation goes well. In this function, the principal has the right to choose the best and must assist teachers so that teachers have the opportunity to upgrade themselves to be more professional. To get a good and productive workforce, a series of activities are needed, ranging from planning, recruitment, selection, training, development, and performance appraisal [20]. The actuating step is an activity in moving all teachers in improving their performance to achieve school goals by working together [21]. Programs that have been planned and compiled at the next staffing stage are implemented, especially digital literacy programs. Then, the evaluating aspect is the assessment of the teacher's performance in carrying out the tasks given so that the planned program can be achieved. Evaluation has an important role to identify obstacles in the implementation of digital literacy programs and develop digital literacy processes so that they run according to the goals set by the principal. In addition, in the application of the IPOSACE model, the lowest score is the planning aspect. *Planning* is a systematic and orderly step to achieving organizational goals. Organizational programming is prepared at the planning stage. Planning also includes setting goals and finding ways to achieve program goals [22]. In planning, there are two important things, namely activity planning, and budgeting. The planning stage includes the thought process and plans that will be carried out for future activities. At the planning stage, activities are arranged so that digital literacy programs, and teachers can run well and effectively. Activities carried out in planning include setting goals, enforcing strategies, and developing plans to coordinate activities. However, the implementation of the planning of the teacher literacy competency improvement program is not optimal.

3.3   Results of digital literacy skills after IPOSACE implementation

Table 5. Results of Teacher Digital Literacy Competence After Implementation of the IPOSACE Model

No	Indicator	Score Mean	Category
1	*Internet Search*	4, 30	Very High
2	*Hypertextual Navigation*	3.75	High
3	*Content Evaluation*	3.90	High
4	*Knowledge Assembly*	4.05	Very High
	Overall average	4	High

Description of the mean score:
0.00 – 1.00 = Very Low
1.01 – 2.00 = Low
2.01 – 3.00 = Middle
3.01 – 4.00 = High
4.01 – 5.00 = Very High

Based on the results of the study in table 5, the results of teachers' digital literacy competence increased after the implementation of the IPOSACE model. The average overall score of teacher digital literacy competence is 4.00 in the high category. The internet searching indicator which originally scored 3.01 became 4.30. The hypertextual navigation indicator became 3.75, the initial score was only 2.23. In addition, the content evaluation indicator experienced an increase in scores from the medium category to high. Likewise, the knowledge assembly indicator obtained a score of 4.05 in the very high category which initially obtained a score of 2.49 in the medium category.

Based on the results of interviews and observations, teachers' digital literacy skills increased after applying the IPOSACE model. Elementary school teachers have been able to use their abilities optimally on the search engine in optimizing learning such as finding sources, references, materials, and learning media. In addition, they can understand the characteristics of we according to their respective fields, able to evaluate the information in digital media. Ability to evaluate content or information in the media, starting by checking the background of information sources validly and reliably then analyzing and compiling information sources obtained on the internet.

The results of this study resemble the previous research conducted by Rasmi (2016), which revealed that the application of the POAC (Planning, Organizing, Actuating, and Controlling) learning model was able to improve teacher competence at MIN Kendari [13]. The form of teacher competency improvement is through Teacher Working Groups (KKG), workshops, and seminars. This also reinforced that the POAC theory and management cycle can be a reference in improving quality, for example, the quality or quality of educators in digital literacy [18].

4   Conclusion

Based on the results and discussion above, it can be concluded that the application of the IPOSACE model can improve the digital literacy skills of elementary school teachers in elementary schools throughout Simo District, Boyolali Regency, Indonesia. The results of the study revealed that there was an increase in the teacher's digital literacy score from 2.49 in the medium category to 4 in the high category. The results of the study can be useful for improving the competence of other teachers by using the IPOSACE model.

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