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Classroom Teacher's Digital Literacy Level based on Instant Digital Competence Assessment (IDCA) Perspective

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Abstract: Technological developments have made digital literacy one of the survival skills in the 21st century, which is linked to development of teacher core competencies, and digital literacy. This study aims to evaluate the level of digital literacy among teachers in the classroom. This descriptive qualitative case study involved 6 teachers at elementary school in Surakarta as the subjects which were chosen through purposive sampling by using digital literacy framework based on the Instant Digital Competence Assessment (IDCA) perspective. It classifies digital literacy into three dimensions, namely technology, cognitive, and ethics. The results showed that, on the technology dimension, 16.67% of the subjects were in the medium category, 50% in the low category, and 33% in the very low category. On the cognitive dimension, 33.33% of the subjects were in the moderate category, 16.67% in the low category, and 50% in the very low category. On the ethical dimension, 50% of the subjects were in the high category, 16.67% in the low category, and 33.33% in the very low category. Thus, it has been concluded that the digital literacy level of classroom teachers is in the very low to high categories.

Keywords: digital literacy level, elementary school, teacher digital literacy, Instant Digital Competence Assessment

1. Introduction

The digitization occurring in the 21st century indirectly shows that the ability to use digital devices (digital literacy) is one of the essential skills and is essential in life because most activities in the 21st century require digital technology community. Digital literacy, as a 21st-century survival skill, is important for both children and adults. In education, teachers must first acquire competence as a tool to guide students. Digital literacy allows teachers to be more productive in creating interesting digital teaching media.

1.1. Problem Statement

The development of technology and communication (ICT) of the 21st century has changed many areas of life, and critical thinking, problem solving and scientific skills are necessary to be competitive today (Atmojo, Saputri, & Fajri, 2022). One of the six literacy skills designated by the World Economic Forum as a 21st century life skill in 2015 is digital literacy (Mason, Khan, & Smith, 2016). The World Economic Forum in 2016 created 3 dimensions with 16 skills as a provision to survive in the life of the 21st century, which was later called 21st-century life skills (Szabo, Körtesi, Guncaga, et al., 2020), one of which is literacy. These skills include reading and writing as they improve students' critical thinking skills, students' numeracy problem-solving skills, students' scientific literacy, digital literacy, financial literacy, cultural and social skills, and cultural civic literacy that can improve students' creativity and innovative potential (Wiedarti, Laksono, Retnaningdyah, et al., 2019).

ICT development in the 21st century led to digitalization in various fields of life, so this century is referred to as the "digital century" (Gecikli, 2021). Digitization in education is marked by the shift from the paper-based to the computer-based national examination (UNBK, *Ujian Nasional*

Berbasis Komputer), the processing of student report cards into an e-report system, the shift of university admission paper-based test to computer-based written examination (UTBK, *Ujian Tulis Berbasis Komputer*), and the existence of various learning applications and school webs. The Indonesian government has implemented programs to improve digital literacy among its citizens, including the launch of a school literacy campaign that includes five other key literacy concepts. However, this is not always effective as there are barriers from both infrastructure and teachers (Mailizar, Almanthari, Maulina, et al., 2020).

Digital literacy as a 21st-century survival skill is important for both children and adults because the development of technology and digitization in the present and future eras is inevitable so that human resources (HR) that can adapt to the times are required (Ahsan, Ismail, & Ahmad, 2022). Educational institutions as one of the institutions that prepare students to confront and overcome existing challenges 21st century have an important role in developing students' digital literacy skills. In this regard, it is advised that educators increase their proficiency in accordance with standards, particularly those pertaining to digital literacy (Spante, Hashemi, Lundin, et al., 2018). One of the roles of teachers is to be both an educator and guide for students through the material, educational stakeholders have a role to play in developing the digital literacy of students through digital media exploration so that they can articulate themselves, be experienced, and become today's generation (Hoechsmann & Poyntz, 2012). Teachers play a role in teaching digital literacy to their students, especially the material related to socio-emotional and cognitive aspects, e.g., ethics interacting in the digital world, reviewing the credibility of digital information, and security in using technology, understanding the use of digital technology is important, but this is rarely properly taught in formal education, as it takes a long time to acquire digital skills in education (Güneş & Bahçivan, 2018). In the 21st century, as a person who guides and introduces students to the development of competence, teachers must first acquire competence as a tool to guide students (Tican & Deniz, 2019).

Digital literacy skills are one aspect of the mandatory competence of teachers (Almås & Krumsvik, 2007). The Law no. 14 of the Republic of Indonesia of 2005 "Regarding Teachers and Instructors" Article 10 Paragraph 1 states that teacher competence includes educational, personal, social and professional competences. These four competencies are then detailed in the form of teacher core competencies as contained in the Appendix of Minister Regulation of National Education Number 16 of 2007 dated May 4, 2007, concerning Academic Qualification Standards and Teacher Competencies. Elementary school, junior high school, senior high school, and vocational school have 4 competencies with 24 core competencies. Pedagogic competence consists of core competencies 1–10; personality competence consists of core competencies 11–15, social competence consists of core competencies 16–19; professional competence consists of core competencies 20–24. Core competencies 5 (pedagogic competence) and 24 (professional competence) specifies that educators must have good skills in utilizing ICT for the benefit of the learning process in the education field because ICT plays an essential role in presenting material easily and in a way that students can comprehend, communicate, and self-develop so that indirectly they are required to have competence to use ICT. The ICT Competency Framework for Teachers initiated by UNESCO in 2018 states that the ICT competencies of teachers contain several aspects, one of which is digital literacy. Based on this, digital literacy is one of the skills that must be possessed as a support for the fulfillment of teacher pedagogic and professional competencies. Educators can aid students in their learning by using digital literacy because the availability of learning resources affects students in the process of learning and receiving learning resources, it marks learning resources and distinguishes between valid and available learning resources. Learning resources can come from books, the internet and other digital technologies, significant, and beneficial. Digital literacy allows teachers to be more productive in creating interesting digital teaching media such as images, audio, video, games, and so forth (Buckingham, 2016).

Teacher digital literacy is a provision in teaching digital literacy to students, and digital literacy is one aspect of teacher competence. However, many elementary school teachers do not have adequate digital literacy skills. Meanwhile, classroom teachers at elementary school in Surakarta for the academic year 2021/2022B have integrated digital technology in learning as one of the learning media.

1.2. Related Research

A study was conducted by Zakharov, Komarova, Baranova, et al., (2022) who examined digital competence and pedagogic competence of teachers in Russia. The results showed that teachers of general education organizations had an average or moderate level of ICT competence. Existing research has focused on identifying the digital literacy capabilities of children born in the digital age (digital natives). The IDCA results suggest that (1) the overall performance of the IDCA participants was only "pass" rather than "good" or "excellent," which may imply that Chinese digital natives are not necessarily digitally literate. (2) There were significant differences in the digital capabilities of participants. (3) Participants' digital skills varied by education level and age. (4) Participants' digital skills were not significantly affected by factors such as the presence or absence of a computer, home internet access, computer frequency, and internet use (Ranieri, 2010). Meanwhile, the novelty of this research is the combination of the three aspects of the study into the digital literacy level of classroom teachers in elementary schools using the IDCA perspective.

1.3. Research Objectives

This study seeks to describe the level of digital literacy among classroom teachers seen from the IDCA perspective, based on the problem statement.

2. Theoretical Framework

2.1. Digital Literacy

The term "digital literacy" was coined by Gilster in 1997. Glister (1997:1) states that the capacity to comprehend and use information in various formats from digital media is known as digital literacy. Depending on the growth and development of the times and technology, digital literacy is becoming wider in the direction of cognitive components and social attitudes. Currently, digital literacy is not only focused on skills related to technology but also involves insight when using digital technology including the internet (Rambousek, Stipek, & Vankova, 2016). This is in line with the statement of Buckingham (2016) that the concept of digital literacy is about technical mastery of computers as well as insight when using digital technology including the internet.

Digital literacy is the knowledge and skills required on using digital media like as Google, YouTube, e-books, as well as communication tools such as cellphones and laptops to find, evaluate, use, create, and use information correctly, wisely, intelligently, carefully, precisely, and lawfully. In attempt for community activities to run smoothly and safely, good communication and interaction must be established (Suhardi, Muhammad, Iskandar, et al., 2017). Understanding information in digital formats, such as words, images, and sound recordings, is known as digital literacy (Spante, Hashemi, Lundin, et al., 2018). Digital literacy is the use and creation of skill-based content, such as employing student learning tools, finding and sharing information, answering questions, solving problems, communicating with others, and learning computer programming (Vodă, Cautisanu, Grădinaru, et al., 2022). In addition, digital literacy is the capacity to use digital technologies to accurately, safely, and efficiently access, manage, comprehend, integrate, communicate, evaluate, and process information in order to create new and better jobs. A learning process that engages students and sparks their interest and motivation is also made possible by digital technologies (Jin, Reichert, Cagasan, et al., 2020). Digital literacy is one's ability to find and evaluate information, utilize

information, create new content, share information, and communicate it through appropriate digital technology (Reddy, Sharma, & Chaudhary, 2020).

Ng Wang developed the idea of digital literacy into three intersecting dimensions in 2012: the technical, cognitive, social-emotional, and emotional dimensions (Ng, 2012). Technical proficiency is only one component of digital literacy; another is the capability to filter the variety of information available on digital media (Wang, 2016). The level of digital literacy varies from person to person. Different levels of digital literacy are influenced by a number of variables, including age, education, occupation, income, region of residence, and socioeconomic status (Rizkinaswara, 2020; Scherer & Siddiq, 2019; Urbacikova, Manakova, & Bielcheva, 2017).

Considering the definition above, it is reasonable to conclude that digital literacy is the knowledge and critical thinking skills that enable all students to explore and discover what they do not know. Digital literacy also improves students' problem-solving skills, ehances their ability to collaborate with others, and advances their ability to communicate seamlessly with other leaders, understanding, integrating, utilizing, and communicating information or content in digital media that involves critical, creative, and inspirational thinking skills.

2.2. Classroom Teachers

Elementary school is a formal education that has a learning period of 6 years starting from grade I to grade VI (Suggate, Schaughency, & Reese, 2013). Each class is taught by one teacher or a classroom teacher (Gerretson, Bosnick, & Schofield, 2008). Appendix of Permendiknas or the Minister of National Education (now Kemendikbudristek) No. 35 of 2010 concerning Technical Guidelines for the Implementation of teacher's Functional Positions and Credit Scores states that classroom teachers are teachers with different duties, responsibilities, powers and rights to completely replace subjects in the learning process of all subjects taught in a given class kindergarten and elementary school and other equivalent formal education units, except for physical education and health and religious education subjects. Classroom teachers are educators who are given the task of teaching various subjects in a class at school. They teach core subjects in elementary educational institutions, namely the Indonesian Language, Mathematics, Natural Sciences, Social Sciences, and Citizenship (Yuhanis, Arafat, & Puspitasari, 2020). Based on the above definition, it can be synthesized that elementary school teachers are teachers who are given full duties, responsibilities, authorities, own goods and possessions while studying and mastering all the basic subjects in elementary school.

2.3. Classroom Teacher Digital Literacy

Digital literacy skills for students can be introduced by integrating digital technology into learning. This is in line with the statement of Syahid & Nugraha (2019) that classroom management at the elementary school level in Indonesia is directed to integrate ICT into learning activities. Students in the 21st century are Generation Z who grow and develop along with advances in digital technology so the integration of digital technology in learning can make elementary school students feel that this is following their characteristics of growing and developing with digital technology (Jannah, Prasojo, & Jerusalem, 2020). This allows classroom teachers to introduce digital literacy to students because they teach all core subjects in class, so they have the most interaction time with students compared to subject teachers.

Digital literacy skills can help classroom teachers implement learning and distinguish learning sources that are true, significant, and beneficial. These skills allow them to be more productive in creating digital teaching media (Buckingham, 2016). Digital teaching media that uses multimedia devices make learning more interesting and not boring. Based on this, digital literacy is very useful for elementary school classroom teachers because one of the needs of elementary school students is interesting and fun learning media to increase their learning motivation (Rachmadtullah, Zulela, & Syarif Sumantri, 2019; Tamrin, Azkiya, & Sari, 2017).

2.4. *Instant Digital Competence Assessment* (IDCA)

Calvani et al. (2008) developed an instrument for measuring the level of digital literacy called the Instant Digital Competence Assessment (IDCA). It was developed to balance digital literacy skills so that digital competencies are expected to spread rapidly in educational curricula around the world (Calvani, Cartelli, Fini, et al., 2008:186). IDCA was developed specifically to measure the level of digital literacy in education. This is motivated by the awareness of Calvani, Cartelli, Fini, & Ranieri that digital competence stands as an important challenge for the 21st-century education system. IDCA is a broad instrument for knowledge of linguistic and conceptual skills that can be measured by structured tests. Measuring digital literacy levels using IDCA can be done by research institutions and individuals (Calvani, Cartelli, & Fini, 2008:186). IDCA divides digital literacy competence into 3 dimensions, namely technological, cognitive, and ethical dimensions.

In more detail, the digital literacy framework used in the IDCA instrument can be seen in the following table.

Table 1. The digital literacy framework instruments

No.	Area		Indicator
1	Technological Dimension	1.1	Recognizing technological troubles
		1.2	Identifying interfaces
		1.3	Determining the most suitable technology solution
		1.4	Dealing with logical operations
		1.5	Classifying processes
		1.6	Distinguishing reality from the virtual world.
2	Cognitive Dimension	2.1	Relating to the text (summarizing, representing, analyzing
		2.2	Organizing data
		2.3	Selecting and interpreting graphs
		2.4	Evaluating relevant information
		2.5	Evaluating information reliability
3	Ethical Dimension	3.1	Protecting yourself
		3.2	Appreciate on the internet
		3.2	Understanding social and technological inequality

Source: Calvani, Cartelli, Fini, et al., (2008); Calvani, Fini, & Ranieri (2009)

3. Method

3.1. Research Design

The research method used is qualitative. Qualitative research is giving meaning to or interpretation of a phenomenon or symptom, either to the perpetrator or the product of his natural actions (Creswell & Poth, 2016). This study is descriptive research aiming toto explore and describe a phenomenon or case that can be in the form of programs, events, processes, institutions, or social groups by describing variables related to the problems and units studied under natural conditions. Descriptive research consists of several types, namely case study, survey, developmental study, follow-up study, documentary analysis, and trend analysis (Creswel & Poth, 2016).

This research used a case study descriptive research design. Case study descriptive research is an intensive and in-depth investigation of an event and activity, which can be in the form of people, programs, events, processes, institutions, or social groups (Creswell & Poth, 2016). Through case study research, an in-depth and detailed picture of a situation or object can be found (Creswell & Poth, 2016).

This study investigates and describes the level of digital literacy of classroom teachers at elementary school in Surakarta considering digital literacy as one of the contributing factors to support learning.

3.2. Participant/Respondent

The subjects were chosen using purposive sampling. Purposive sampling is a non-random sampling technique in which a research sample is expected to respond to the research context, determined by a specific identity that aligns with the research objectives (Sugiyono, 2018; Yusuf, 2017). The subjects in this study were 6 teachers in classes I–VI in elementary school in Surakarta for the academic year 2021/2022B. The consideration of selecting classroom teachers as a sample in this study was based on their duties and roles. They were tasked with teaching most of the subjects in class, so they had the most interaction time with students compared to subject teachers. Therefore, classroom teachers have greater opportunities in introducing digital literacy to students through technology integration into learning. The classroom teachers in elementary school Surakarta for the academic year 2021/2022B have met the criteria as the research subject because they were tasked with teaching all core subjects in the class. They had also integrated technology into learning. The selected sample is expected to provide quality data because the sample are individuals who are directly engaged in the process, implementation, and evaluation of learning activities.

3.3. Data Collection

The data were gathered using tests. Test is a measurement tool to collect information on the characteristics of an object. The test instrument in this study was used to measure teachers' digital literacy knowledge skills who were faced with questions about digital literacy which were composed of technological, cognitive, and ethical dimensions. The test questions are prepared based on digital literacy indicators according to IDCA. There are 36 description questions with a score range of 0–4. The teachers' digital literacy test scores were analyzed for completeness with a threshold of 75 adopted from the IDCA digital literacy measurement (Calvani, Fini, & Ranieri, 2009). The indicator completeness results were then calculated on a scale of 100 to get the final scores. The final scores were categorized using established assessment guidelines to determine digital literacy level categories for homeroom teachers.

Table 2. Digital Literacy Level Categorization Guidelines

Score	Category
81–100	Very high
61–80	High
41–60	Medium
21–40	Low
<21	Very low

3.4. Data Analysis

Data analysis is an effort to find, organize, present data and field findings, and find the meaning of an occurring event or case(Yusuf, 2017). The data analysis used in this study is based on all data obtained during data collection during the study. In this study, Miles and Huberman's interactive data analysis method was chosen because this research used case study research. Miles and Huberman describe the process of analyzing qualitative research data as interactive, including data collection, data condensation, data presentation, and conclusion drawing/verification (Miles, Huberman, & Saldana, 2014).

3.5. Validity and Reliability

The data is valid if it is the same as the data in the field (Sugiyono, 2015). Thus, it is necessary to test the validity of the data. The data were validated using a focus group discussion (FGD), a discussion to find the meaning of an issue to avoid the wrong meaning of a researcher

(Rahardjo, 2020). FGD was chosen to validate the data to avoid subjective meaning. The meaning of an issue that has gone through the FGD is expected to be more objective and valid. FGD participants can come from colleagues, practitioners, experts, or representatives from the research institutions. The FGD participants in this study were 2 supervising lecturers, the principal at the related elementary school, and the senior teachers at the related elementary school.

4. Findings

The indicators used in this research are based on IDCA, which consists of 14 indicators divided into 3 dimensions, namely technological, cognitive, and ethical dimensions. The technological dimension consists of 6 indicators, the cognitive dimension consists of 5 indicators, and the ethical dimension consists of 3 indicators. From the technology dimension, 1 classroom teacher had a moderate level of digital literacy, 3 had low digital literacy, and 2 had very low digital literacy. From the cognitive dimension, 2 classroom teachers had moderate digital literacy, 1 had low digital literacy, and 3 had very low digital literacy. From the ethical dimension, 3 classroom teacher had high digital literacy, 1 had low digital literacy, and 2 had very low digital literacy.

4.1. Technological Dimension

Based on the results of the study, the digital literacy levels of the classroom teachers on the technology dimension are as follows.

Table 3. Digital Literacy Level from Technological Dimension

Subject	Score	Category
Classroom Teacher 1 (CT 1)	16.67	Very low
Classroom Teacher 2 (CT 2)	33.33	Low
Classroom Teacher 3 (CT 3)	33.33	Low
Classroom Teacher 4 (CT 4)	33.33	Low
Classroom Teacher 5 (CT 5)	50	Medium
Classroom Teacher 6 (CT 6)	16.67	Very low

Based on Table 2, in the technological dimension, class 1 and class 6 teachers had very low levels of digital literacy, class 2, class 3, and class 4 teachers had low levels of digital literacy, and class 5 teacher had moderate digital literacy. The results showed that, on the technology dimension, 16.67% of the subjects were in the medium category, 50% in the low category, and 33% in the very low category. Graphically, the digital literacy levels of classroom teachers in the technology dimension are visualized as follows.

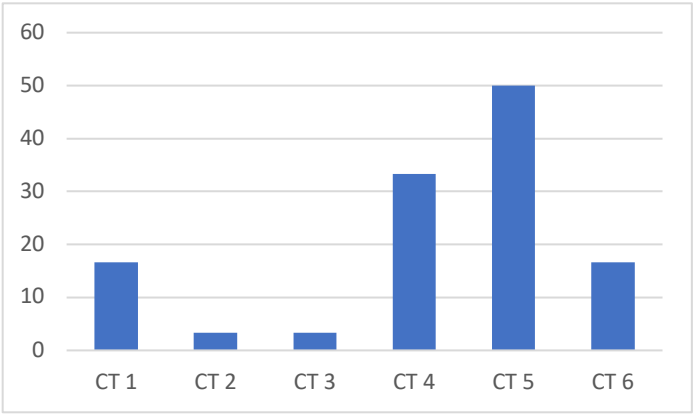

Figure 1. Chart of Classroom Teacher Digital Literacy Levels from Technological Dimension

Based on Figure 1, class 5 teacher had the highest level of digital literacy in the technological dimension, and class 2 and class 3 teachers had the lowest level.

4.2. Cognitive Dimension

Based on the results of the study, the digital literacy levels of the classroom teachers on the cognitive dimension are as follows.

Table 4. Digital Literacy Level from Cognitive Dimension

Subject	Score	Category
Classroom Teacher 1 (CT 1)	20	Very Low
Classroom Teacher 2 (CT 2)	40	Low
Classroom Teacher 3 (CT 3)	20	Very Low
Classroom Teacher 4 (CT 4)	60	Medium
Classroom Teacher 5 (CT 5)	60	Medium
Classroom Teacher 6 (CT 6)	0	Very Low

Based on Table 3, in the cognitive dimension, class 1 and class 6 teachers had very low levels of digital literacy, class 2 teacher had a low level of digital literacy in the cognitive dimension, and class 4 and class 5 teachers had moderate digital literacy. The results showed that, on the cognitive dimension, 33.33% of the subjects were in the moderate category, 16.67% in the low category, and 50% in the very low category. Graphically, the digital literacy levels of classroom teachers in the cognitive dimension are visualized as follows.

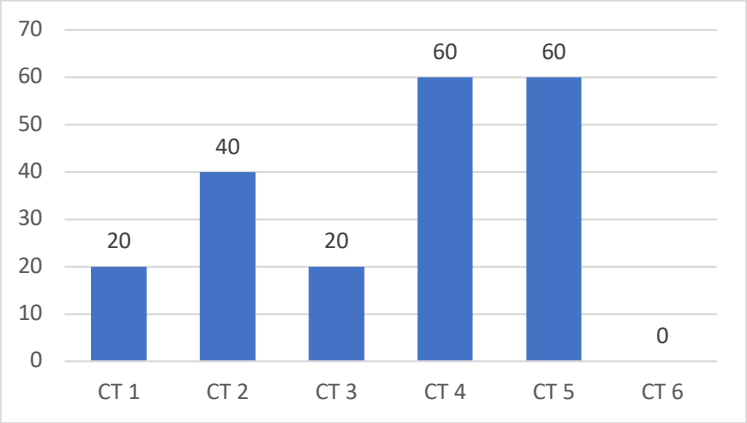

Figure 2. Chart of Classroom Teacher Digital Literacy Levels from Cognitive Dimension

Based on Figure 2, class 4 and class 5 teachers had the highest levels of digital literacy in the cognitive dimension while grade 6 teacher had the lowest digital literacy.

4.3. Ethical Dimension

Based on the results of the study, the digital literacy levels of the classroom teachers on the ethical dimension are as follows.

Table 5. Digital Literacy Level from Ethical Dimension

Subject	Score	Category
Classroom Teacher 1 (CT 1)	66.67	High
Classroom Teacher 2 (CT 2)	0	Very Low
Classroom Teacher 3 (CT 3)	33.33	Low
Classroom Teacher 4 (CT 4)	66.67	High
Classroom Teacher 5 (CT 5)	66.67	High
Classroom Teacher 6 (CT 6)	0	Very Low

Based on Table 4, in the ethical dimension, class 1, class 4, and class 5 teachers had high levels of digital literacy, class 2 and class 6 teachers had very low levels of digital literacy, and class 3 teacher h had as low digital literacy. The results showed that, on the ethical dimension 50% of the subjects were in the high category, 16,67% in the low category, and 33.33% in the very low category. Graphically, the digital literacy levels of classroom teachers in the ethical dimension are visualized as follows.

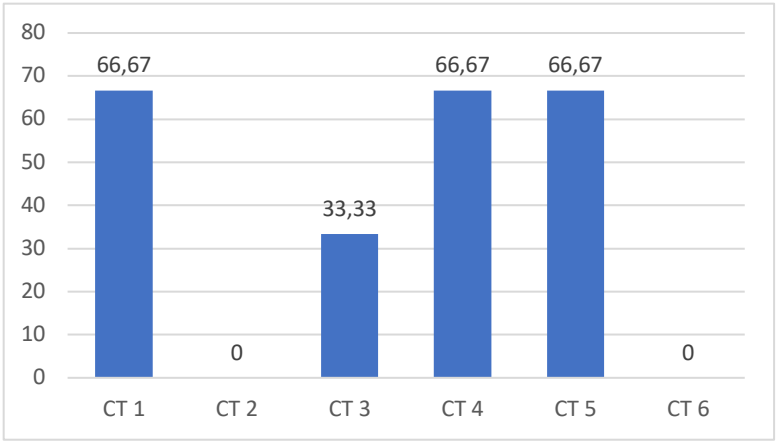

Figure 3. Chart of Classroom Teacher Digital Literacy Levels from Ethical Dimension

Based on Figure 3, class 1, 4, and 5 teacher had the highest level of digital literacy in the ethical dimension, and class 2 and class 6 teachers have the lowest levels.

5. Discussion

The findings of this research show that the digital literacy levels of the classroom teachers in the academic year 2021/2022 were in the range of very low to high. The digital literacy levels of classroom teachers were divided into 3 dimensions according to the perspective used, namely IDCA. The three dimensions of IDCA are technological, cognitive, and ethical dimensions. From the technology dimension, 1 classroom teacher had a moderate level of digital literacy, 3 had low digital literacy, and 2 had very low digital literacy. From the cognitive dimension, 2 classroom teachers had moderate digital literacy, 1 had low digital literacy, and 3 had very low digital literacy. From the ethical dimension, 1 classroom teacher had high digital literacy, 3 had low digital literacy, and 2 had very low digital literacy.

5.1. Technological Dimension

The technological dimension in the digital literacy level of classroom teachers is explained as the ability to explore, deal with problems, and technological contexts that have been adapted (Calvani, Fini, & Ranieri, 2009). Calvani, Cartelli, Fini, et al. (2008) formulate that digital literacy indicators in the technological dimension include (1.1) recognizing technological troubles, (1.2) identifying interfaces, (1.3) determining the most suitable technology solution (1.4) dealing with logical operations, (1.5) classifying processes, and (1.6) distinguishing reality from the virtual world.

Indicator 1.1 means the ability of a teacher to analyze and recognize the most common or simple technological problems (Calvani, Fini, & Ranieri, 2009). Recognizing technological troubles is needed to help teachers determine actions or solutions to existing problems. This is in line with the opinion of Yu, Fan, & Lin (2014) that analyzing and recognizing problems is needed to help determine the most suitable action or problem-solving solution. This is also in line with the theory of thinking of Wolcott & Lynch (1997) explaining that identifying (recognizing) problems is the first stage before determining problem-solving strategies in the critical thinking process.

Indicator 1.2 means the teacher's ability to identify the names and functions of icons, especially software in technology (Calvani, Fini, & Ranieri, 2009). Teachers' ability to identify the interface supports them in optimally utilizing the application.

Indicator 1.3 means the teacher's ability to choose solutions when faced with problems in the technological environment (Calvani, Fini, & Ranieri, 2009). One of the problems with technology is viruses. Viruses that spread on computers can interfere with the performance of information technology. Viruses can cause problems on computers, one of which is the loss of data (Bowerman, 2017). Viruses can be caused by malicious websites, so it is necessary to protect or block them. The teacher's ability in this indicator can be a teacher's provision to be aware of and protect against problems on the computer and can be a solution if the computer has been exposed to a virus.

Indicator 1.4 is a simple logical ability that is commonly used in search operations (Calvani, Fini, & Ranieri, 2009). The basic search operations on Google include: or (|): searching for information containing one of the two words; phrase ("): searching for information containing the searched phrase by using " "; not (-): search results containing words that are in front of, but not behind (-); synonym (~): searching for words and their synonyms; asterisk (*): word-substitute character; dot (.): word-substitute character. The teacher's ability in this indicator can be their provision in searching for information on Google so that the articles that appear are more relevant to the topic being sought.

Indicator 1.5 is the ability to understand and use symbols and flowcharts as well as program instructions so that they can describe the data flow of a program (Calvani, Fini, & Ranieri, 2009). Flowchart is the use of symbols to describe the steps of entities, processes, and data flows in a program (Rosa & Wahju, 2020). The teacher's understanding of the symbols in the flow chart can be the teacher's provision in making and interpreting a flow chart either digitally or manually.

Indicator 1.6 is the ability to evaluate a clear understanding of the difference between the virtual world and reality (Calvani, Fini, & Ranieri, 2009). Cyberspace provides us with the freedom to be anybody we want, so allows for differences between personalities or individual characters in cyberspace and the real world (Naseh, 2016). Character differences between individuals in the virtual and real worlds are caused by anonymity and invisibility (Drouin, Miller, Wehle, et al., 2016). Anonymity is a condition where the individual identity cannot be identified, so online anonymity decreases public self-awareness (Kim, Lee, & Lee, 2019). Meanwhile, invisibility means that individuals can communicate without showing themselves physically in virtual media interactions (Vavrova, 2014). The teacher's ability to understand these indicators can help them to prevent students from committing violations in cyberspace or falling into negative things by using opportunities for the principles of anonymity and invisibility in virtual media interactions.

5.2 Cognitive Dimension

Digital literacy is the ability of the teacher to correctly convert important data from the text, assess the validity of information, evaluate relevant information, organize data, and make conclusions (Calvani, Cartelli, Fini, et al., 2008). Digital literacy in the cognitive dimension consists of 5 indicators, namely (2.1) dealing with text, (2.2) organizing data, (2.3) selecting and interpreting graphs, (2.4) evaluating relevant information, and (2.5) evaluating information reliability (Calvani, Fini, & Ranieri, 2010).

Indicator 2.1 is the teacher's ability to understand, summarize, represent, and analyze a text (Calvani, Cartelli, Fini, et al., 2008). Internet as a component of digital literacy to support teacher performance in preparing teaching materials and learning media makes books not a single source of learning (Lawrence & Tar, 2018). The existing articles contain a broad discussion, so it requires the ability to analyze information from a text to conclude their contents.

Indicator 2.2 is the teacher's ability to insert, sort, and classify data into a structured organization. These abilities can make data more structured, making it easier to search. The teacher's ability to organize data can help them organize learning materials.

Indicator 2.3 is the teacher's ability to identify types of graphs and represent information from a graph (Calvani, Fini, & Ranieri, 2009). The ability to represent graphics in digital literacy aims to avoid misunderstanding the delivery of messages or information from digital information presented in various graphic forms.

Indicator 2.4 is the ability to know how to evaluate which information is relevant to what they are looking for (Calvani, Fini, & Ranieri, 2009). This is because their students are generation Z who live in the era of information and technology. Their values and outlook on life goals have been influenced by growing up in a world where having access to the Internet has become commonplace. The primary responsibility of the teacher, as stated in Article 1 paragraph 1 of Indonesian Law No. 14 of 2005, is to direct and instruct students in how to select information that is pertinent to their needs if information has become a part of their daily lives (Ramadhan & Nasionalita, 2020).

Indicator 2.5 is the ability to distinguish between false and biased information and to be critical of information on the internet (Calvani, Fini, & Ranieri, 2009). The ability of this indicator is important at this time due to the rise of hoax information in the world of internet-based digital technology today. To avoid hoaxes and obtain valid information, students can cross-check the information and web addresses/websites (Jannana, Prabowo, & Istriyani, 2021; Wijayanto, Widyawati, & Wicaksono, 2022).

5.3 Ethical Dimension

The ethical dimension in the digital literacy of classroom teachers is the teacher's ability to interact and responsibility in using technology (Calvani, Cartelli, Fini, et al., 2008). The ethical dimension includes safety, respect, and awareness of technological inequalities (Calvani, Fini, & Ranieri, 2009). Calvani formulated 3 digital literacy indicators in the ethical dimension, namely (3.1) safeguarding oneself, (3.2) respecting on the net, and (3.3) understanding social and technological inequality.

Indicator 3.1 is the teacher's ability to manage personal data and be aware of the risks of using digital devices (Calvani, Fini, & Ranieri, 2009). The skills contained in this indicator are significant for self-protection against threats in the world of digital devices, especially the Internet. This is motivated by the emergence of cybercrime as a new crime that was born following the rapid development of ICT (Goyal & Goyal, 2017). This is in line with the opinion that one of the duties of a teacher or educator is to prepare students to live in society (Ratheeswari, 2018).

Indicator 3.2 is an attitude of respecting the privacy of other internet users in accordance with the applicable rules (Calvani, Fini, & Ranieri, 2009; Ramadhan & Nasionalita, 2020). Skills in this indicator can help instill social media characters in students. This is in line with the statement that one of the tasks of educational institutions is to shape the character of students (Firmansyah, 2018; Lubis & Wangid, 2019). This is in accordance with the perennialism education philosophy. The relationship between the teacher's ability and this theory is that students already have ability to communicate and communicate with others and the teacher on duty with directing these abilities toward the right interaction skills or according to applicable values and norms.

Indicator 3.3 is the teacher's awareness of social inequality in using digital technology (Calvani, Fini, & Ranieri, 2009; Ramadhan & Nasionalita, 2020). Digital inequality is related to not only the gap in access to digital devices but also the ability of individuals to use digital devices (Robinson, Cotten, Ono, et al., 2015). Differences in the digital access capabilities of classroom teachers require mutual tolerance to achieve harmony. The ability to operate devices will

indirectly rise in areas with affordable access to digital devices and the internet (Urbacikova, Manakova, & Bielcheva, 2017).

6. Conclusion

Digital literacy is one of the survival skills in the 21st century, which requires teacher core competencies to attain the success of learning. Digital literacy will support the teachers to be more productive in creating interesting digital teaching media. This is considered important since students will have to survive living in 21st century, hence they should possess problem-solving, collaboration, and communication skills using digital tools. This study discovered that the classroom teachers' digital literacy was ranging from the very low to high. This implies that the elementary school teacher's digital literacy skills are not equal yet to support the students' needs and characteristics.

Limitation

The limitation of this study is that it only measured the digital literacy level of classroom teachers in only one elementary school. In addition, it only used one framework, namely the digital literacy framework based on the IDCA perspective.

Recommendation

The results showed that most classroom teachers' digital literacy levels were in the very low and low categories. Teachers should always develop their digital literacy skills because they are useful to teach digital literacy to students and are one aspect of the teacher's core competencies. In addition, more trainings on digital literacy are needed to improve teacher's skills to support students' needs and characteristics.

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Conflict of Interest

There are no conflicts of interest during this research and the article publication.

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