

THE INFORMATION AND COMMUNICATION TECHNOLOGY LITERACY LEVEL OF SUKOHARJO'S SENIOR HIGH SCHOOL STUDENTS

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Abstract

The Ministry of Education and Culture inaugurated the Independent Curriculum for primary to secondary education in the new school year 2022/2023. Therefore, this study aims to obtain an overview of the readiness of information and communication technology (ICT) literacy skills mastered by public high school students. Research samples were taken from nine public high schools in Sukoharjo Regency, which implemented the Independent Curriculum. The focus of the research is directed at obtaining an overview of how their ICT literacy skills. The method used is a survey compiled based on the idea of Helsper Schneider, Deursen, and Laar about indicators of digital skills for the younger generation. They divided ICT literacy indicators into information, literacy of computers, media, communication, visuals, and technology. The survey results show that public high school students in Sukoharjo Regency have high ICT literacy skills, 59% in the good category and 5% in excellent. They are ready to take part in teaching-learning processes using the Independent Curriculum.

Keywords : ICT literacy, high school, PISA, Independent Curriculum

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INTRODUCTION

The Ministry of Education, Culture, Research, and Technology introduced the Independent Curriculum for the 2022–2023 academic year. The curriculum revision is necessary because Indonesian education has not advanced significantly over the past 20 years.[1] The Program for International Student Assessment (PISA) test results reveal that Indonesian pupils consistently receive low rankings. With an average score of 375, Indonesia was rated 64th out of 65 countries in 2012.[2] It improved to 62nd place out of 70 nations in 2015, with an average score of 403.[3] Indonesia's average score dropped to 371 in 2018 and was rated 74th out of 79 competing countries.[4]

The World Bank classifies 55% of Indonesian pupils as functionally illiterate based on a study of their PISA score.[5] They are able to read, but they are unable to comprehend what they are reading. When pupils start working, this condition will impact their productivity and workability. According to World Bank data,[6] 65% of the new positions that increased in Indonesia between 2011 and 2016

were in industries with poor productivity and income, with an average annual wage of USD 3,600. The Jakarta office of the World Bank explained that new jobs in Malaysia were about four times as high as those in Thailand, at USD 15,800, and 1.5 times as high as those in Indonesia, at USD 5,300.

Viewed from the character aspect, Indonesian students still need various improvements. As many as 63% of students have low enthusiasm for achieving achievements and self-progress in the academic field. This mindset makes students lazy to learn. This percentage is very high compared to the average PISA participating countries, which is 29%.[1]

Another sad thing is the high number of cases of bullying. 41% of students experience bullying more than once a month. This percentage is much higher than the average bullying experienced by PISA-participating countries, which is 23%.[7] The data shows that in the world of education, there has been a growing attitude of being able to bully friends without considering the impact suffered by the

abused party, especially the psychological burden.

Suppose the condition of the school is positioned as a representation of the life of the surrounding community. In that case, bullying in schools is caused by developing a bullying attitude in society. In the internet world, Indonesian netizens are known to be the cruelest because they often cheat, spread hoaxes, ridicule, bully, discriminate and use hate speech.[8] In the Digital Civility Index (DCI) survey conducted by Microsoft, the position of Indonesian netizens is in the lowest rank or the least civilized of the 32 countries studied.[9] From this point of view, deviations that occur in schools result from behavior that develops in society.

How to overcome the crisis in Indonesia's education world arises. The Independent Curriculum in this context is intended as a panacea for various problems of low academic quality and student character. One of the critical points of the Merdeka Curriculum and the main focus of this study is the development of Information and Communication Technology (ICT) literacy competencies as the mainstay of literacy development in the field of study.[10, 11] There are at least two forces that can be used as reasons for placing ICT literacy as the spirit or soul of education. First, students who study are Generation Z, who have been familiar with touch screen technology from an early age.[12] From this point of view, students will only encounter a few obstacles in utilizing ICT in learning in their field of study. The second reason is that the internet provides sufficient information on all fields of study as a learning resource.[13]

The placement of ICT as the soul of learning for Generation Z does not necessarily mean that the ongoing process will be able to achieve learning objectives optimally. Teachers' primary problem is the unfamiliarity of students using digital devices for academic purposes.[14] Since childhood, students have understood that digital devices are a means of interacting using social media applications and looking for entertainment/fun. Therefore, students will stutter when using digital devices to find academic information. From this point of view, changing the mindset of using digital media for recreational facilities to completing academic assignments is a challenge the world of education must face in Indonesia.

From the various problems of ICT as a central element in learning, this study will be directed to answer the research question: What is the level of competence in Information and Communication Technology (ICT) literacy of

public high school students in Sukoharjo Regency? The question is mainly to understand students' readiness to participate in the Independent Curriculum implementation, which places ICT as a critical element in the learning process.

LITERATURE REVIEW

Revolution 4.0, marked by the mass industry of various digital devices, gave birth to a new generation attached to the digital world since childhood. They are highly skilled at operating various digital devices connected to the internet, such as smartphones, tablets, laptops, and TVs.[15]

The birth of a new generation attached to digital devices is gradually influencing the world of education, especially in the teaching and learning process. The development of the learning process is a step that cannot be avoided because students' lives are closely related to the digital world. Conversely, they need help focusing on listening to lectures for a long time.[16] With the use of digital devices as a support, an awareness emerged that digital skills are fundamental for students to develop life in this era of digital disruption.

Information and communication technology (ICT) literacy has four components, including knowledge of how digital devices work technically and operationally, how to find and use information, how to communicate and engage with others online, and how to create digital material.[17, 18] After that, even the European Union community created an international standard for assessing ICT literacy.[19] The ability to manage and run Information and Communication Technology (ICT) devices, including the processing, management, and conveying or transferring of information between facilities/media, is the technical and operational characteristics of digital devices in this context.[20] According to this viewpoint, regardless of one's social, economic, or cultural status, everyone should be able to master the technical affordability of devices, platforms, and applications, including knowledge of "buttons" and management of settings as well as the knowledge of basic computer programs.[21]

Information search and processing, or the capacity to locate, pick, and assess digital information sources, makes up the second dimension.[22] The third dimension, which is known as digital communication and interaction, is the ability to use digital media and various technological characteristics to engage with others, create networks, and critically assess how interpersonal interaction and mediated

communication affect others.[23] The ability to develop high-quality digital material and comprehend how it is produced and released and how it affects audiences make up the fourth dimension, the creation of digital content.[24]

In the Independent Curriculum, ICT literacy is integral to the Minimum Competency Assessment (MCA). The MCA can be understood as a tool for assessing essential competencies that students must master and are needed to develop their abilities and play an active role in society in activities that have positive value.[25] MCA consists of two types of literacy assessments, namely information and numerical.[26]

The MCA emphasizes students' ability to find information, interpret, integrate, evaluate, and reflect.[27] It was further explained that students are trained to search for, access, and find explicit information from discourse in information-finding skills. In interpretation and integration skills, students are directed to be able to understand explicit and implied information and combine interpretations between parts of the text to produce inferences. On the other hand, students are trained to assess texts' credibility, suitability, and trustworthiness in evaluation and reflection skills. They can relate the contents of the text to other things outside the text.[25]

When viewed from an ICT literacy, the MCA used in Indonesia only covers the first two dimensions of the minimum capabilities used at the global level. MCA focuses on the first two dimensions because the main focus of the Independent Curriculum is to improve the quality of education according to the PISA category.[1]

METHODS

In Sukoharjo Regency, there are ten Public Senior High Schools. This research was planned to use Grade X students in the ten public senior high schools. In each school, one class was randomly taken as a sample. The sample selection in public high schools was left to the teachers without direction from the research team.

The goal of this study is to gauge the minimum level of ICT literacy proficiency following UNESCO recommendations.[19] Helsper et al. conducted a study that served as the basis for the survey's indicators of young people's digital literacy.[18] The following elements of the younger generation's digital skills are:

a. Information literacy is the ability to locate sources, analyze and synthesize information, assess the reliability of sources, use and cite sources legally and ethically,

focus on issues, and create precise, effective research questions.

- b. Computer literacy that defines as the capability to use computers and application software effectively.
- c. Media literacy is a collection of communication skills that includes the capacity to locate, scrutinize, assess, and convey data in various formats, including print and non-print messages.
- d. Using publishing technologies (word processors, databases, spreadsheets, and drawing programs), the internet, and other electronic and telecommunication tools, learners must collaborate effectively as individuals and in groups.
- e. Visual literacy represents the capacity to "read," "interpret," and "understand" information presented in pictorial or graphic images. The capacity to transform all types of information into images, graphics, or shapes that help communicate information; a set of skills that allow people to recognize and interpret visible actions, objects, and symbols they come across in their environment, whether natural or artificial.
- f. Technological literacy represents the individual's capacity to use computers and other technologies to improve learning, performance, and productivity.[28, 29]

The data collection method uses an online survey in which students are given a link containing questions about ICT literacy. This method is used because it can reach a large number of samples in a short time. The questions in the ICT literacy survey are self-assessment questions, which measure each student's abilities from their perspective.[30]

In this survey, each question item is given seven answer choices so that students can choose the answer closest to their actual ability in ICT literacy. The answer to each question has seven options:

- 1) With guidance, I can understand the skill.
- 2) I recognize the skill.
- 3) I recognize and can describe these skills.
- 4) I recognize and can explain the skill - provide relevant examples to demonstrate it.
- 5) I can help others to recognize the skill.
- 6) I can teach and help others to recognize these skills.
- 7) None of the answer choices describe my abilities.

FINDINGS

On 17 May 2022, data collection was held through an ICT literacy survey. Of the ten public high schools sampled, one school, namely Tawang Sari 1 Public High School, still needs to

apply the Independent Curriculum in 2022/2023. Thus, the data is taken only from nine public high schools. The survey results are illustrated in Table 1.

According to the table above, 64% of pupils have the skills necessary to become ICT literate. This figure demonstrates that the majority of Sukoharjo Regency public high school students are prepared to pursue careers in fields related to information and communication technology. Students in Sukoharjo Regency's public high schools are literate in ICT, which is evidence that they recognize the benefits of using the internet to help to learn. Numerous studies demonstrate that when participating in online learning activities, students are more engaged and driven to study.[31] In agreement with that, Suwatno, Hadijah, Adman, Islamy, and Muhidin[32] discovered that in addition to being

Table 1. ICT Literacy Competencies of Public High School Students in Sukoharjo Regency

Score	Grade	Desc.	Freq	%
85 - 100	A	Very Good	31	5%
70 - <85	B	Good	335	59%
60 - <70	C	Fair	159	28%
56 - <60	D	Poor	19	3%
50 - <56	E	Very Poor	21	4%
<50	F	Failed	5	1%
Total			570	100%

highly motivating, ICT also enables students to develop their creativity, thinking habits, attitudes, personalities, and problem-solving abilities. ICT-based education can be enthusiastically adopted and enhances student.[33, 34]

Internet resource searching, advanced hypertext linkages, information discussion and evaluation, and knowledge construction are all encouraged for students. Even Muiyasaroh et

al.[35] reported that students at Grobogan State Madrasah Aliyah (Madrasah Aliyah Negeri/MAN) in Central of Java province had high average ICT literacy scores across all four characteristics examined. ICT-based learning in the field of study will make the learning process enjoyable and, at its best, boost their learning achievement.[36]

Although the majority of students have quite excellent ICT literacy skills, it should be highlighted that up to 36% of pupils still require extra help in order to catch up rapidly. Pupils with low reading competencies will surely fall farther behind if the school treats students with strong ICT literacy competence equally with those who are left behind.

From the twenty survey items, in general, the obstacles experienced by students were mainly related to the questions: no. 8. Find information on the internet, no matter how complex the hyperlinks and hypertext are designed on a website; no. 9. Use the advanced search on search engines; no. 17. Understand how many people see the content I create and upload to online media; and no. 20. Understand the various licenses for online content, both paid and free.

A further study of the barriers experienced by students will be used as a sample of three public high schools with different geographic locations. The three high schools are:

Sukoharjo 1 Public High School, which was placed as a high school representative located in the city,

Mojolaban 1 Public High School is a representative for high schools located in the suburb, and

Weru 1 Public High School represents SMA with the geographical location in the village.

The first obstacle students experience is finding a web with complex hypertext and hyperlinks. The constraints faced by students can be seen in Table 2.

Table 2. Competence to find information on the internet, no matter how complex the hyperlinks and hypertext are designed on a website.

No	Answer	Location of Schools		
		City	Suburb	Village
1	With guidance, I can do the skill.	61%	51%	54%
2	I can do the skill independently.	30%	32%	28%
3	I can perform and explain these skills orally and in writing.	0%	4%	1%
4	I can perform and explain orally and in writing and provide relevant examples to demonstrate the skill.	3%	4%	9%
5	I can help others to do the skill.	0%	2%	1%

6	I can teach others to master the skill.	2%	1%	0%
7	Of all the choices of statements above, none of them describe my abilities.	5%	6%	6%
Total		100%	100%	100%

In the table above, it can be understood that most students need help utilizing complex hyperlinks and hypertext on websites. It can be seen from the number of students who chose the answer, "With guidance, I can do that skill." The difficulties are common among public high schools in cities, suburbs, and remote villages. As a result, students will need more information, especially to understand technical terms with

hypertext explanations.[37] Students will also need help deepening a part of the problem which the website is directed to by hyperlinks.[38]

Students also need help in using advanced searches provided by search engines. They also have never opened a sophisticated search. Students' difficulties can be seen in their answers, as shown in Table 3.

Table 3. Use the advanced search on search engines.

No	Answer	Location of Schools		
		City	Suburb	Village
1	With guidance, I can do the skill.	44%	44%	47%
2	I can do the skill independently.	38%	39%	31%
3	I can perform and explain these skills orally and in writing.	4%	6%	1%
4	I can perform and explain orally and in writing and provide relevant examples to demonstrate the skill.	4%	6%	4%
5	I can help others to do the skill.	5%	4%	6%
6	I can teach others to master the skill.	2%	0%	1%
7	Of all the choices of statements above, none of them describe my abilities.	4%	2%	9%
Total		100%	100%	100%

Table 4. Students' Weaknesses in the competence of digital content creation and production

No	Answer	Finding a way for many people to see the content that I create and upload on online media.			Understand the various licenses for online content, both paid and free.		
		City	Suburbs	Village	City	Suburbs	Village
1	With guidance, I can do the skill.	48%	41%	48%	42%	46%	50%
2	I can do the skill independently.	32%	40%	37%	34%	35%	25%
3	I can perform and explain these skills orally and in writing.	4%	3%	0%	4%	4%	3%
4	I can perform and explain orally and in writing and provide relevant examples to demonstrate the skill.	6%	7%	6%	11%	10%	3%
5	I can help others to do the skill.	2%	2%	0%	3%	1%	0%
6	I can teach others to master the skill.	5%	2%	2%	2%	1%	2%
7	Of all the choices of statements above, none of them describe my abilities.	4%	5%	8%	4%	3%	17%
Total		100%	100%	100%	100%	100%	100%

Although less as high as competency in exploring websites with complex hypertext and hyperlinks, almost half of the students who took part in the survey answered that they needed guidance. Students' limitations in using advantaged searches occur fairly evenly in high schools, cities, suburbs, and villages. Even more concerning, the number of students with the highest competence is minimal, namely 2% in city public high schools, 0% in the suburbs, and 1% in villages.

Of the two weaknesses students possess in information search and processing, it can be assumed that learning outcomes will be less than optimal. They tend to look for simple information and do not deepen it with advanced information, either utilizing the facilities provided through hypertext and hyperlinks or using sophisticated searches.

Students' weaknesses are also found in the fourth dimension, namely the competence of digital content creation and production, the ability to create high-quality digital content, and understanding the mechanics of the content being produced and published and how this content has an impact.[24] The weaknesses are illustrated in Table 4.

From Table 4 above, in the three question items about the competency of digital content creation and production, students who need more assistance than students who can perform these skills independently. This pattern of answers occurred in public high schools in cities, suburbs, and villages. On the weaknesses of students in the competency of finding ways so that many people see the content created and uploaded to online media, it illustrates that they need to be guided on how to create keywords or Search Engine Optimization (SEO).[39] Competence in using keywords is also needed in searching for information on the internet.

Another problem is the need for more understanding of students about various licenses. Without having this competency, student creations will easily get caught up in copyright infringement when using other people's work in their work, whether in the form of background music, video clips, and pictures/photos.[40] From this point of view, mentoring and training are needed so that students can choose other people's work that can be used without violating copyright.

DISCUSSION

One of the interesting findings is that there is a discrepancy between ICT literacy skills and information literacy, especially in students' reading. On the one hand, the survey

findings indicate that high school pupils have a comparatively high level of computer literacy. However, the PISA test from 2018 had poor outcomes. This issue can be brought about by the underuse of ICT in academic tasks. South Africa and Sweden are two more countries with low literacy rates.[41] Although most students believe that reading is a crucial part of learning, in reality, they behave in the exact opposite way.[42] The same issue with reading proficiency in high school students exists in Philippine education.[43] The main areas where high school students struggle are with the following abilities: (1) recognizing different patterns of idea development (comparison and contrast, definitions, descriptions, and narrations) in texts; (2) evaluating the coherence, organization, grammar, and mechanics of the text; (3) possessing a wide range of vocabulary; and (4) identifying methods of selecting and organizing information.[44] This suggests that giving reading comprehension improvement more serious consideration.[45]

High school pupils' poor reading skills have a wide range of effects, particularly on further education. Many kids still need to strengthen their literacy skills, even in the United States, which is considered a developed nation. In order to access higher education, 50% of Kentucky high school graduates need literacy interventions, according to the National Center for Educational Evaluation and Regional Assistance.[46] Education institutions generally provide introductory reading and writing courses to students from all majors, both domestically and internationally.[47] According to Calvo, Celini, Morales, Martnez, and Nez-Cacho Utrilla,[48] this initiative progresses in combining reading skills development programs with the disciplines under study. This integration will simultaneously promote literacy and academic competencies to complement the Sustainable Development Goals (SDGs) agenda.[42, 49]

The space for applying higher institution-developed solutions to junior and senior high school education is enormous. The development of reading abilities falls under the purview of both language studies and academic learning in general. History is a good illustration. Historical literacy is the combination of reading instruction materials with historical lessons. Reading historical writings is one topic that receives excellent attention. When reading history books, students are more concerned with comprehending historical events and determining whether the stories are accurate. Text is used in historical literacy books as a means of communication to present discoveries, ideas, and views.[50] Therefore, a critical

evaluation of the book's intent and the source's reliability is required. A more profound knowledge of historical narratives can be attained through comprehending the communication partner's point of view.

Finding evidence from historical accounts is a fundamental historical literacy skill that must be acquired.[51] Students are taught to think like historians in this situation by making source criticism.[52] They were instructed to evaluate these claims by critically analyzing the sources that were cited. The requirement for various or contradictory historical narratives is an issue that frequently arises. For students to locate primary and secondary texts to compare various historical accounts, instructor help is essential.

Because every historical event covered in history textbooks is a complex social reality, contextualizing historical thought is the third ability required.[53] Therefore, having a thorough awareness of the complexity of social reality at the site and time of historical events will provide you with a unique viewpoint. Additionally, pupils' ability to contextualize will be a hindrance from a perspective focused on the here and now.[54]

CONCLUSION

From the description of ICT literacy competencies that have been carried out, it can be concluded that public high school students in Sukoharjo Regency have relatively high understanding and skills. This competency

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shows that students are familiar with digital devices and can operate them properly. From this point of view, students are relatively ready to learn the Independent Curriculum, which focuses on developing information literacy and numeracy. They can search, find, and process information within a certain difficulty level.

The main area for improvement in the search and information processing dimension is when students have to deal with complex websites with lots of hypertext and hyperlinks. From this point of view, students will be challenged if given the task of deepening certain aspects of their field of study using ICT. Therefore, teachers need to direct students to relatively easy sources of information.

Another area for improvement is that students still need to be skilled at using advanced searching. The consequence of this weakness is that information is obtained from frequently visited websites. They will need help finding the information provided by websites that specifically provide unique or unpopular information.

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