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ICT Literacy Analysis of Junior High School Students Through Environmental Learning on Green Consumerism Using Padlet

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Abstract: Information and communication technology supports innovative learning and creates a learning environment to develop student competencies in the 21st century. Science learning that is integrated with ICT can equip students with ICT literacy as a provision for a future full of global competition. This study aims to analyze students' ICT literacy through learning the green consumerism environment with the help of Padlet. This study uses a quantitative descriptive method with a research sample of 32 students of grade VII SMPN 2 Bungkal taken by purposive sampling technique. Data collection techniques using interviews, questionnaires, and observation. Research instruments in the form of interviews, questionnaires, and observation sheets. The data analysis technique is a quantitative percentage to determine the category of students' ICT literacy. The results show that students' ICT literacy scores for each aspect are access 100% (very high), manage 96.88% (very high), integrate 87.5% (very high), evaluate 40.63% (very low), create 56.25% (low), and communicate 75.00% (medium). The average percentage of students' ICT literacy scores reached 76.06% in the high category. The results of this study can be used as a basis for developing integrated science learning materials with ICT to facilitate students' ICT literacy.

Keywords: ICT literacy; Environmental learning; Green consumerism; Padlet.

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Introduction

Environmental learning teaches students on various environmental concepts with topics related to environmental issues (Lemus et al., 2014). Environmental issues encountered by students in everyday life, including green consumerism, recycling, flooding, water pollution, waste avoidance, climate change, and global warming (Gu et al., 2015; Karpudewan et al., 2015; Mustam & Daniel, 2013). Green consumerism is a person's behavior in using environmentally friendly goods and services. (Matthes & Wonneberger, 2014). The problem of green consumerism, students must have a good ability to analyze to provide an evaluation of plastic use policies. After providing an evaluation then be able to create a solution (Chalkiadaki, 2018; Talmi et al., 2018). Ichsan et al. (2019), solving the environmental problems related to green consumerism requires the ability to analyze, evaluate, and create.

The learning process uses a lot of online media that allows communication between students and teachers about learning outside the classroom. Learning with online media can increase student motivation as

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well as learning more fun and effective. Online media that are often used by teachers such as Facebook, Edmodo, MOOC, Blog, YouTube, Google Classroom, Telegram, and others (Rashid et al., 2019). The use of online media requires teachers to have the ability to use good information technology. Support from the school is also needed to support technology-based learning both its learning media and learning resources (Suhendri et al., 2020).

Information and communication technology makes learning more innovative and creates a learning environment to develop students' competencies in the 21st century (Moto et al., 2018). ICT literacy as the basic knowledge of the 21st century needs to be integrated into the learning process (Lestari & Prasetyo, 2019; Scott, 2015; Wilson et al., 2018). Integrating ICT in science learning can be applied as early as possible to equip students' ICT literacy as a provision for a future filled with global competition (Eliana et al., 2016).

ICT literacy is the ability to use technological devices, and social networks appropriate to define, access, manage, evaluate, integrate, create and communicate effectively and responsibly ICT literacy in its implementation requires cognitive abilities and technical skills (Thammasaeng et al., 2016; Yazon et al., 2019). ICT literacy includes (1) knowledge and skills operating technological devices; (2) skills to process online information; and (3) skills to communicate online, both orally and in writing (Latip, 2020). ICT literacy is demonstrated by the ability to manage, organize, integrate, evaluate information and build new knowledge and communicate (Syarifuddin, 2014).

ICT literacy is an ability that must be possessed by students (Muawiyah et al., 2018). Kim et al. (2019), low ICT literacy of high school students in grades 7, 8,9 and the magnitude of the gap in ICT literacy as students age. Lestari & Prasetyo (2019), that ICT literacy students are still not well in the aspect of manage, evaluating, creating, communicating, use the internet safely and responsibly. Students should get used to using the internet as a source of learning. In addition, ICT-based learning can support and complement face-to-face learning that enables teachers and students to communicate anytime (Ezekoka & Gertrude, 2015).

Muskania & Wilujeng (2017), ICT literacy of students to access aspects 90.61%; manage 100%; integrate 90.91%; evaluate, create 100% and communicate 100%. The average percentage of ICT literacy students is 88.90%, which is on the criteria very well. Tania et al. (2020), the percentage of ICT literacy aspects per indicator obtained from pilot classes was 68.47% and for implementation classes by 75.42%. ICT literacy assessment results are categorized quite well with a range of 56%-75%. The average score between the two classes was 71.95 so ICT literacy was categorized quite well.

ICT literacy students can be facilitated by using ICT-based learning platforms or media, one of which uses Padlet. Padlet is a web-based application that provides pages that allow users to send posts, images, and even videos, which can be viewed by anyone through a specific page address (Rashid et al., 2019). Students can use Padlet to upload information to virtual boards using a simple drag-and-drop system. Padlet view is like a page full of notes consisting of videos, text, links, documents, and images (Zainuddin et al., 2020). Students can utilize Padlet to develop arguments in writing. Teachers can post specific topics to discuss and students can type and share their ideas, suggestions, or perspectives on the topic. Teachers can organize all posts that require students to display their names on the board for assessment purposes (Latipah & Gunawan, 2020; Zainuddin et al., 2020).

Padlet as a learning media makes teachers have many choices of platforms as an innovative, interactive, interesting, and effective means of learning (Susanto et al., 2021). Research on the use of Padlet in supporting the success of the learning process has been scientifically and empirically proven. Padlet has the advantage of easy and unpaid use (Sari, 2019). Using Padlet makes students learn actively and independently because students can be creative and express themselves (Zainuddin et al., 2020). Padlet provides a platform for a student-centered learning environment where students have the opportunity and experience using an online learning platform (Jong & Tan, 2021).

The results of interviews with science teachers in SMP N 2 Bungkal are known that teachers have never measured students' ICT literacy and Padlet has never been used in science learning which integrated green consumerism. Therefore, Padlet is used to facilitate students in learning the green consumerism, environment to be able to obtain information through teaching materials, videos, articles, and other sources presented. This research aims to analyze students' ICT literacy through learning the environment of green consumerism using Padlet. Aspects of ICT literacy observed in this study are access, manage, integrate, evaluate, create, and communicate.

Method

The study uses quantitative descriptive methods to analyze students' ICT literacy through learning the environment of green consumerism using Padlet. The aspects and indicators analyzed are presented in Table 1.

Table 1. Aspects and indicators of ICT literacy

Aspects	Indicator
Access	Accessing Padlet through the website address Accessing facilities inside Padlet
Manage	Downloading files provided in Padlet Upload file into a Padlet
Integrate	Using sources of information contained in the Padlet
Evaluate	Assessing the accuracy of information obtained through Padlet
Create	Transform information in the form of data by utilizing ICT devices
Communicate	Convey information in writing to others using ICT devices

The study was conducted at JHS 2 Bungkal Ponorogo on October to November 2021 with a research sample of 32 grade VII students taken with purposive sampling techniques. Data collection techniques use interviews, questionnaires, and observations. Research instruments in the form of interview guidelines, questionnaires, and observation sheets. The data analysis technique used is with quantitative percentages to determine the category of students' ICT literacy.

Data from ICT literacy observations were obtained, then analyzed using steps: 1) Calculate the total score of each respondent. 2) Calculate the percentage (Purwanto, 2009) of respondents' answer scores using Equations (1). 3) Convert a percentage into a value by category in Table 2. Students' ICT literacy scores are analyzed based on the percentage of proficiency of each aspect of ICT literacy ability. The percentage value is obtained using the equation 1 from Purwanto (2009) as follows.

$$NP = \frac{R}{SM} x100\% \quad (1)$$

Where, NP = Percentage value; R = total score; and SM = Maximum score value.

Table 2. Provision for converting scores into categories

Interval (%)	Category
85<X≤100	Very High
75<X≤85	High
65<X≤75	Medium
55<X≤65	Low
X≤55	Very Low

Result and Discussion

In this study, the authors conducted a questionnaire through Google Forms regarding the use of ICT in science learning, the results obtained presented in Table 3.

Table 3. Questionnaire results on the use of ICT in science learning

Statement	Yes (%)	No (%)
Could access wifi/internet network easily at school using a smartphone	96.90	3.10
Could download science materials on the internet to help in working on science assignments from school	93.80	6.20
Could upload science tasks given by teachers using smartphones	96.90	3.10
Difficulties when learning science using smartphones	87.50	12.50
Often utilize features or apps on smartphones for science learning in the classroom	9.40	90.60
Ever used the online learning media Padlet	12.50	87.50

Table 3. The majority of students can use smartphones in learning activities. Easy and fast internet access is needed to facilitate them in the learning process. Most students could access the internet network at school (96.9%), could download material (93.8%), could disrupt assignments (96.9%), difficulty using a smartphone (12.5%). Based on this, students are able and ready to follow science learning integrated ICT. However, the utilization in the class has not been maximal. Most students have not utilized a wide range of applications for science learning in the classroom (90.6%), and have never used an online learning medium such as Padlet (87.5%). Learning with online media can allow students to read deeper materials, exercises, and assignments, as well as produce more effectively than traditional classes (Eliana et al., 2016).

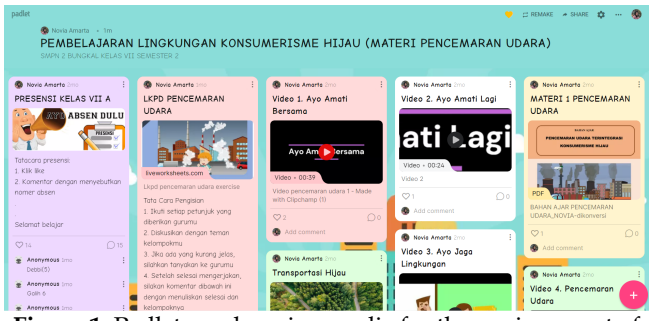

Figure 1. Padlet as a learning media for the environment of green consumerism

Figure 1. Padlet demonstrates as an online medium that can be used in science learning activities, especially in learning environments integrated green consumerism to facilitate students' ICT literacy. All learning materials can be uploaded in Padlet and accessed easily using a smartphone, PC/laptop with the help of an internet connection. Following some research results, that Padlet is easy to use, interesting, almost any type of file or media can be entered and can

be used on many different devices (Jong & Tan, 2021; Sangeetha, 2016; Zhi & Su, 2016). Students feel motivated by the use of this media in the classroom (Beltrán-Martín, 2019). Jong & Tan (2021), Padlet received a lot of positive feedback from various studies, and its features are suitable for use as learning and assessment devices. Availability of internet connection and ICT literacy as a support in the use of Padlet in the classroom.

ICT literacy involves interests, attitudes, knowledge, skills, and willingness to use and integrate ICT in the early stages of education (Belalang & Rahman, 2015). ICT Literacy is the ability to build students' knowledge related to the processing of information sources (Tania et al., 2020). The results of the study are in the form of students' ICT literacy level data that can be developed for further research on student ICT literacy in science learning. From the results of the analysis obtained ICT literacy scores of SMP N 2 Bungkal students in environmental learning integrated with green consumerism on 6 aspects of ICT literacy are shown in Table 4.

Table 4. Results of ICT literacy score analysis

Aspects	Score Percentage (%)	Category
Access	100.00	Very high
Manage	96.88	Very high
Integrate	87.50	Very high
Evaluate	40.63	Very low
Create	56.25	Low
Communicate	75.00	Medium
Average	76.04	High

Based on Table 4. aspects of ICT literacy have very high categories on 3 aspects, namely access, manage, and integrate because these are basic skills mastered by almost all students. Students already often operate smartphone devices and access the internet in their daily lives. Medium categories on the communicate aspect because only a few students could convey information or the results of smartphone discussions. Low categories on create aspect and very low categories on evaluate aspect. Most students are not used to using and processing the information they get from a variety of sources. Information or results that they can write directly without sorting out which information is appropriate and appropriate. Students have skills in searching the internet, social networking, e-mail, and gaming, but are less skilled in other skills such as using digital libraries and discussion forums (Siddiquah & Salim, 2017).

Students' ICT literacy score with an average achievement percentage of 76.06% with high categories. Tania et al. (2020), the average value of ICT literacy is categorized as 71.95 so it can be said that its literacy indicators in the criteria are quite good. Muskania & Wilujeng (2017), the support of learning tools developed can equip students' basic knowledge of ICT literacy with excellent criteria. Students with higher ICT literacy scores signify that they are familiar with ICT media and can use them to address technological issues involved in their learning activities as well as often have a much higher academic achievement (Lei et al., 2021; Siddiquah & Salim, 2017).

ICT literacy is influenced by the availability of devices, ease of access, frequency of use, and length of use of ICT devices. Therefore, aspects of ICT resources and accessibility need attention (Siahaan & Gunawan, 2021). Slow speed of ICT devices, internet network problems with ICT devices, poor working conditions of ICT devices, load shedding, and lack of internet access are the problems faced by most students (Jong & Tan, 2021; Siddiquah & Salim, 2017). The level of satisfaction of students in the classroom who use ICT has a positive influence to achieve higher ICT literacy scores. ICT literacy of students in schools located in major cities is higher than in rural areas at an average rate (Kim et al., 2014).

The high results of students' ICT literacy are expected to be able to support integrated science learning with ICT as a 21st-century learning demand that facilitates student ICT literacy. However, it is necessary to improve student ICT literacy on the aspect of evaluate, create, and communicate by applying to learning facilitated by ICT media. This research can be used as a reference for schools and teachers' learning plans, especially science learning. Science learning facilitated by ICT media can be applied using various learning models and approaches, such as inquiry, problem-based learning, discovery learning, and project-based learning.

Conclusion

The average percentage of students' ICT literacy scores in SMPN 2 Bungkal was obtained 76.06% in the high category carried out by observing 6 aspects which include access 100% (very high), manage 96.88% (very high), integrate 87.5% (very high), evaluate 40.63% (very low), create 56.25% (low), and communicate 75% (medium). Students are familiar with ICT media and can use it in learning activities. However, students are not yet used to using and processing the information they get from various sources. This research is an early study for the development of the green consumerism e-module using a guided inquiry model to improve students' ICT literacy.

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