THE USE OF DIGITAL LEARNING OBJECTS IN THE NATURAL AND SOCIAL SCIENCE SUBJECT TO IMPROVE STUDENTS'S ECOLITERACY

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Abstrak

Kepedulian seseorang terhadap lingkungan (ecoliteracy) penting dibangun sejak kecil agar tumbuh kebiasaan baik dalam memperlakukan lingkungan. Untuk menumbuhkan konsep ini, sektor pendidikan berperan strategis melalui hadirnya mata pelajaran yang relevan dengan isu-isu lingkungan. Penelitian ini bertujuan untuk meneliti penggunaan digital learning object (DLO) sebagai sumber belajar digital pada mata pelajaran IPAS untuk meningkatkan ecoliteracy siswa kelas VI di SDN 195 Isola. Dalam penelitian ini, ecoliteracy merupakan hasil belajar kognitif (dimensi head), afektif (dimensi heart), dan psikomotor (dimensi hands). Penelitian dilakukan dengan metode pra-eksperimen menggunakan satu kelompok penelitian dengan desain One-Group Pretest Posttest Design untuk dimensi head dan One-Shot Case Study untuk dimensi heart dan hands. Sampel penelitian diambil menggunakan teknik purposive sampling dengan berdasar terhadap karakteristik umum siswa sekolah dasar kelas VI. Adapun pengumpulan data dilakukan menggunakan instrumen tes, instrumen angket, dan instrumen penilaian kinerja. Temuan penelitian menunjukan bahwa penerapan digital learning object pada mata pelajaran IPAS menghasilkan peningkatan terhadap dimensi head dan berkontribusi positif terhadap dimensi heart dan hands. Pada dimensi head, diperoleh peningkatan nilai yang signifikan sebagai implikasi dari peningkatan visualisasi konten sumber belajar, terakomodasinya interaksi pengguna, dan diperkuatnya retensi pengetahuan. Pada dimensi heart, diperoleh partisipasi aktif siswa dalam kegiatan pembiasaan peduli lingkungan di sekitar rumah sebagai implikasi dari pola pembiasaan dengan bantuan DLO. Pada dimensi hands, siswa mampu menemukan hubungan antara pengetahuan, keterampilan, dan pengalaman nyata terkait lingkungan sebagai implikasi dari pemanfaatan DLO yang diintegrasikan dengan kegiatan daur ulang sederhana. Berdasarkan hasil penelitian, upaya peningkatan ecoliteracy siswa perlu terus dilakukan pembaruan khususnya pada dimensi heart dan hands.

Kata kunci : Digital Learning Object; Modul Digital; Ecoliteracy; IPAS

Abstract

A person's concern for the environment (ecoliteracy) is crucial to instill from an early age to cultivate positive habits in environmental stewardship. To foster this concept, the education sector plays a strategic role through the introduction of subjects relevant to environmental

issues. This study aims to investigate the use of digital learning objects (DLO) *as a digital learning resource in Integrated Science and Social Studies* (IPAS) *subjects to enhance the ecoliteracy of sixth-grade students at SDN 195 Isola. In this research, ecoliteracy encompasses cognitive (head), affective (heart), and psychomotor (hands) learning outcomes. The research employed a pre-experimental method using a single research group with a One-Group Pretest Posttest Design for the head dimension and a One-Shot Case Study for the heart and hands dimensions. Sampling techniques involve purposive selection based on the characteristics of the sixth-grade students. Data collection employs various instruments, including tests, questionnaires, and performance assessments. The findings indicate that the utilization of digital learning objects in* IPAS *subjects leads to improvements in cognitive dimensions and positively influences affective and psychomotor dimensions. Enhanced visualization, increased user interaction, and improved knowledge retention contribute to cognitive growth. Active participation in environmental activities due to habituation supported by DLO is observed in the affective dimension. Additionally, the integration of DLO with simple recycling activities facilitates the connection between knowledge, skills, and real-life experiences in the psychomotor dimension. Based on the research findings, efforts to enhance student ecoliteracy need continuous updates, especially in the heart and hands dimensions*

Keywords*: Digital Learning Object; Digital Module; Ecoliteracy; Natural Science*

I. Introduction

Human concern for the environment should begin at a young age. It refers to human beings' roles as the dominating living beings in transforming the conditions of nature. Today's human life processes are susceptible to errors that hurt environmental sustainability and inflict damage in various ways. This is relevant to Wulandari's (2016) opinion that ecological damage is caused by human negligence and ignorance of the need to sustain the sustainability of the living environment. An ideal human being is concerned about the environment and strives to maintain and manage every aspect of sustainable movement. Therefore, a person must acquire a mindset of concern for the environment from a young age to grow a good view of every action in treating the environment.

The local population is essential for sustainable development initiatives, currently, its ecological conditions reflect the people's lack of environmental knowledge. The Ministry of Environment and Forestry presented an overview of Indonesia's environmental situation in 2022, showing the presence of nationally dominant environmental challenges including land, water, air, and garbage. (Liyanto, 2022). These problems interact and interrelate, resulting in a reduction in environmental quality. According to Mukharommah (2023), the Environmental Quality Index (IKLH) report shows that 256 of Indonesia's 514 urban districts, or 49.8%, have not met the IKLH target. Furthermore, Indonesia is one of the world's 17 biodiversity-rich countries (Sardjono, 2011). The low public concern for the environment is a dangerous condition, and human resources (HRM) is the key to success in achieving the goals of sustainable development.

Primary school has become one of the formal educational paths to transform the values of environmental care. This is relevant with the view of Ngalawiyah (2015) which explains that primary schools have an important role in conservation, and cultural transmission, up to the internalization of environmental awareness values. One of them is Lhokseumawe Aceh Sukma School which seeks to build students' ecoliteracy capabilities through the Green School Project (GSP), the impact of which students have a character that cares more about the school environment. (Hajar, 2023).

Ecoliteracy is the concept of becoming aware of one's ecological environment and demonstrating a way of engaging with it to live a sustainable existence. (Goleman. 2012). In short, eco-literacy is a person's ability to understand and act responsibly toward the environment. The Centre of Ecoliteracy demonstrates that ecoliteracy consists of four dimensions, including 1) head, this dimension pertains to the issue of ecological understanding, which can be analogued to cognitive capacity. 2) hearth, this dimension connects to the qualities of self-empathy, which can be analogized as attitude skills, 3) hands, these dimensions relate to the dimension of the deed, similar to the ability to act/skill. and 4) spirit, this dimension refers to the individual feature of action. (McBride et.al, 2013).

The development of eco-literacy skills can be done by integrating living environmental material into classroom learning. Natural and Social Sciences are one of the Merdeka Curriculum subjects that explore environmental topics and are relevant to attempts to foster eco-literacy. These courses aim to improve learners' understanding and skills in natural sciences, social sciences, and environmental challenges (Andreani & Gunansyah, 2023). This demonstrates that there is a link between the development of ecological literacy and IPAS learning, which must be accomplished through the active learning process (HOTS) by incorporating students' knowledge, attitudes, and abilities to produce a full learning experience.

HOTS learning can be developed through the use of a variety of learning resources. AECT (1977, pp. 26) defines a learning resource as any resource that a learner can utilize in learning, either individually or in pairs, to help them achieve their learning objectives. One type of learning resource is the use of e-learning in a learning process that includes a key component known as a Digital Learning Object (DLO) or digital learning object. Simply described, this component is a collection of entities that includes a purpose, instructional materials, and training to assist with the learning process. DLO can be used in e-learning applications to improve eco-literacy. The usage of DLO is intended to stimulate student activity in the cognitive, emotive, and psychomotor worlds, which are also consistent with the eco-literacy dimension. The ecoloiteracy dimensions also include knowledge (head), attitude (heart), and skills. (hands). The external DLO for this study was created in a variety of types of media, including video explainers, interactive videos, infographics, interactive quizzes, and digital LKPD placed on a Wix-based website. The usage of digital learning objects is intended to facilitate IPAS learning, which leads to improved eco-literacy capabilities,

although the chosen Natural and social science course language topic is "Our Earth is under Danger Situation".

Based on the previous discussion, the purpose of this study is to examine how students at SDN 195 Isola use digital learning materials on Natural and Social Science subjects concerning their eco-literacy levels. The use of DLO as a digital learning resource will help to improve the eco-literacy dimension, which includes the head, hearth, and hands dimensions.

II.   Methodology

Quantitative approaches are used because researchers will process data involving statistical calculations to describe increased eco-literacy after using digital learning objects. The method used in this research is the experimental method. In this study, the researchers used pre-experimental methods with One-Group Pretest Posttest Design in combination with the One-Shot Case Study. This combination is based on the fact that the data taken is a student learning result that covers knowledge areas (head dimensions), attitude areas (heart dimensions), and skills areas (hand dimensions).

The participants in this study are the sixth-grade students at SDN 195 Isola VI consisting of 3 classes with a total of 80 students. The sample selection technique in this study is nonprobability sampling. The samples used in this research are students of class VI C. The selection of the VI C class as a sample is based on the recommendations and requests of teachers in the school.

The data collection process is carried out using both test and non-test instruments. The test instruments are used to obtain data on the eco-literacy of the head dimensions, while the non-tests are used for obtaining data about the ecologitariancy of the heart and hands dimensions. In the case of the test instrument, it is structured in the form of a quotation question that includes the cognitive dimensions C4, C5, and C6. Meanwhile, non-tests are developed in the shape of a questionnaire and a performance assessment sheet. In this study, students are involved in learning processes that apply digital learning resources in various formats, follow environmental care activities around the house, and undertake simple recycling activities producing garbage products and pots for plants.

After collecting the data, the researchers will examine and analyze the results of the pretest and posttest to measure the ability of the eco-literacy of the head dimensions. To demonstrate the impact of the use of digital learning objects on the head dimensions, pre-test, and post-test data will first be performed as a prerequisite test of normality of data. In this study, the normality test will be done with the help of the SPSS program using the formula one sample Shapiro Wilk because of the small amounts of samples. Further, to prove a significant increase in head dimensions, it is necessary to test with inferential statistical techniques. This study used the formula t-test sample related (paired sample t-test) with normal data distribution conditions (Sugiyono, 2015). Further to know the ability to data ecoliteracy dimensions heart and hands after applying digital learning objects, researchers use descriptive statistical

techniques to process and group data. As for the steps in descriptive statistics, including presenting tables, graphs, diagrams, calculating modes, medians, mean, calculations, decils, and presentils, up to calculating average standard deviations and percentages (Sugiyono, 2018).

III. Findings & Discussion

A. Findings

The research was carried out at SDN 195 Isola located in Gegerkalong Girang, Gegerkelong, Sukasari district, Bandung City, West Java. The participants in this study were sixth-grade students with a total of 80 people, while the sample taken amounted to 26 people from classes VI-C. Population selection at the high-class level assumed that students had access to personal digital devices such as exercises or smartphones as a tool to support research during learning so students were assumed to be able to adapt to the use of digital learning resources.

The selection of SDN 195 Isola as the research setting is based on the relevance and research needs, the minimum use of technology as a digital learning resource as well as efforts to develop eco-literacy in students. The typical learning process is done conventionally relying on one direct method and book as a learning resource. In addition to the need for innovation of learning resources, the development of ecological literacy competence (eco-literacy) in students is also a need at this research site. The factual condition is the result of preliminary studies through interviews with teachers along with the dissemination of questionnaires to students.

1. Use of Digital Learning Objects versus Ecoliteracy Dimensional Head (Knowledge)

The process of using digital learning objects to enhance the eco-literacy of the head dimension (knowledge) was carried out during three meetings concerning the learning syntax of the teaching module that was designed and validated through expert assessment. On the first day, the learning process begins with an opening session to briefly present the activities that will be done with the researchers over the next three days. In addition, the researchers also surveyed the availability of student exercise devices and created a WhatsApp group with students for communication during the study. The researchers submitted a research product in the form of a digital learning object that can be accessed online through a student's exercise device. The digital learning object platform can be accessed by scanning the barcode below.

Source: Personal Document

Picture 1 : Barcode Platform Digital Learning Object

Through the barcode above, students will be facilitated to access the digital learning object platform that has been prepared by the researchers. Researchers don't always have to send a link to students through a WhatsApp group, but it's only enough to display the above image through a projector.

Source: Personal Document

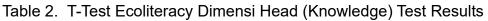Picture 2 : Form of Digital Learning Object Platform

That image is the main page of the digital learning object platform. The page will appear the first time a visitor opens the page. Visitors will be presented with some information related to the use of the platform. Based on the results of the application of digital learning objects to improve the eco-literacy of the head dimensions. The researchers obtained data that can be calculated in the following table:

Table 1. N Gain Ecoliteracy Dimensional Head Test Results (Knowledge)

Pre test	Post test	Post test-Pre test	Skor ideal-Pre test	Skor N Gain	Skor N Gain (%)
31,04	43,00	11,96	28,96	0,42	42,05

Source : Personal Document

The impact of the DLO application on the ecoliteracy of the head dimensions is based on pre-test and post-test acquisition data. The results of the test showed that the pre-test data obtained a significance value of 0.066 and the post-tested data received a significant value of 0.125. Both of these significance values each have a larger number than the Alpha value used, which is 0.05. It can then be concluded that both pre-test and post-test data are normally distributed and hypothesis testing can be carried out with the Paired Samples T-Test formula as part of the analysis of research data. As for the results of the hypothesis test, they are shown in the following table:

Table 2. T-Test Ecoliteracy Dimensi Head (Knowledge) Test Results

Paired Samples Test

| | | Paired Differences | | | | | | | |
| | | | | | 95% Confidence Interval of the Difference | | | | |
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	NILAI_PRE - NILAI_POST	-19.938	10.039	1.969	-23.993	-15.883	-10.127	25	<.001

Source : Personal Document

Based on the table above, a significance value of 0.01 is obtained where this value is less than (<) 0.05. Thus it can be concluded that there is an improvement in the ability to eco-literacy the head dimension (knowledge) in the students of the sixth grade in SDN 195 Isola after using the digital learning object on the Natural and Social Science.

It is also known that the t_table value in this study is 2,055 with a 95% confidence rate. Based on the results of the test in the above table obtained a $\mathbf{t_{count}}$ **count value -10,127**. This indicates that the t_{count} is in the receipt zone H1 ($-t_{count} \leq t_{table} \leq t_{count}$). Then from that, it can be concluded that there is an improvement in the ability to eco-literacy the head dimension (knowledge) in the students of the sixth grade in SDN 195 Isola after using the digital learning object on the Natural and Social Science.

Based on the research data obtained shows there is a significant improvement in the eco-literacy of students' head dimensions (pengetahuan). This is demonstrated by N-gain gains from the pre-test and post-test scores, which is 0.42 which belongs to the middle category. This increase is proof that students' eco-literacy on the head dimension (knowledge) has improved after being given treatment.

2. The use of digital learning objects against ecoliteracy dimensions of the heart (Attitude)

The use of digital learning objects aimed at enhancing the eco-literacy of the heart dimensions refers to the learning syntax on the teaching modules designed and still in the same learning network as the efforts to enhance the other ecologiteracy dimensions. The learning process to enhance this dimension, starts with the presence of an infographic learning message related to environmental concerns, as face-to-face learning takes place, the researchers involve using infographics as a learning resource in support of IPAS materials while stimulating students to make simple habits that can have a good impact on the environment. The researchers then instructed the students

to practice a variety of simple habits that could be done in the environment around the students. As a form of indirect surveillance, students are directed to fill in individual reports as a description of activities that have been carried out on the DLO website. Scan this barcode and here are the documents of DLO in the development of eco-literacy heart dimension (attitude).

Source : Personal Document

Picture 2 : Barcode DLO in Development of Heart Dimension

As for the hearth's dimensional eco-literacy capability data obtained from the lifting results distributed by the researchers to the students of class VI-C SDN 195 Isola as a sample. The racket consists of eight statements derived from the heart-dimensional eco-literacy indicator, each of which is measured with a score of 1 to 5, resulting in the lowest expected score of 8 and the highest expected value of 40. Based on the spread of the lift, the following descriptive statistical table is obtained:

Table 3. Descriptive statistic of Ecoliteracy Heart Dimension

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Eco_Hearth	26	14	26	40	30.96	3.965
Valid N (listwise)	26					

Source : Personal Document

Next, each eco-literacy score of the heart dimensions is grouped and presented based on the interval scale of the entire data processing result, however, the result of the grouping of the score is presented in the table below.

Table 4. Numerical Frequency Distribution Ecoliteracy Heart Dimensions

Interval Class	Fi	F%	Xi	fX
26-28	8	31	27	216
29-31	10	38	30	300
32-34	2	8	33	66
35-37	3	12	36	108
38-40	3	12	39	117
41-43	0	0	-	-
Results	**26**	**100**	**165**	**807**

Source : Personal Documents

From the table above it can be seen that the score with the most frequency is the second class with a scale of 29-31 scores obtained by 10 people. It is known that as many as 8 people are below the average score and 8 are above the average. So it can be concluded that students' eco-literacy abilities on the heart dimension are on average scores. The acquisition data is then classified into the criteria that have been established, and the frequency distribution is as follows:

Table 5. Categorical Frequency Distribution Ecoliteracy Heart Dimensions

NO	CLASSIFICATION	RESULTS (N)	PRESENTASE (%)
1	Very high	4	15 %
2	High	3	12 %
3	Medium	11	42 %
4	Low	8	31 %
5	Very low	-	-
Results		**26**	**100 %**

Source : Personal Document

From the above table, we can see that the students' eco-literacy scores on the heart dimension after applying the digital learning object, consisted of 8 people with low categories, 11 people with medium, 3 people with high category, and 4 people with very high category.It can be conclude that frequental value in the heart dimension.

The results of the study showed that there was a contribution of digital learning objects to students' eco-literacy in the heart dimension. This can be demonstrated by the achievement of each student's scores through the spread of questionere, the highest frequency regarding the ecoliteracy scores of the heart dimensions is in the middle category. The achievement of these scores is known after the treatment is given, that is, the application of DLO to the learning of IPAS. The eco-literacy scores of the heart dimensions are not solely influenced by the implementation of the DLO, but the implications of the use of this DLO are only one of the external factors that determine the learning outcome.

1. **Use of Digital Learning Objects versus Ecoliteracy Dimensions Hands (Skill)**

The use of digital learning objects to enhance the eco-literacy of the hand's dimensions refers to learning scenarios designed on the teaching module as well as remaining in the same learning network as efforts to improve the other eco-literacy dimensions. The use of DLO to improve the eco-literacy dimensions of hands is carried out through simple recycling practices to produce garbage sites and crop pots. Learning begins with a presentation of DLO in the form of an interactive video and infographic with the topic of efforts to address environmental problems. This is directed as an introduction to the IPAS material and stimulates students to introduce the concept of the importance of keeping the environment through various actions such as 3R. After giving the introduction, then the researchers directed students to work

with the group to recycle used gallons into garbage and plant pots (learning community), students also presented the DLO form of digital LKPD (E-LKPD) as a guide in the work. As far as DLO's intake is concerned, the increased eco-literacy of the hand dimensions can be accessed on the barcode below.

Source : Personal Document

Picture 3 : Barcode DLO for Development of Ecoliteracy in Hand's Dimension

As for the ability data, eco-literacy dimensions of hands were obtained from performance assessments using observation sheets assisted by teachers. The performance observation sheet consists of 4 statements derived from the eco-literacy indicator of the hands dimension, each statement is measured using a rating scale consisting of scores 1, 3, and 5. To obtain the lowest expected score of 4 and the highest expected value of 20. Based on the performance assessment performed, the statistical descriptive table is obtained as follows:

Table 6. Descriptive Statistics of Ecoliteracy in Hand's Dimension

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Eco_Hands	26	14	6	20	12.38	3.753
Valid N (listwise)	26					

Source : Personal Document

Next, each eco-literacy score dimension hands are grouped and presented based on the interval scale of the entire data processing results, however, the grouping scores are presented in the table below.

Table 7. Numerical Frequency Distribution Ecoliteracy Dimensional Hands

Interval Class	Fi	F%	Xi	fX
6-8	7	26.92	7	49
9-11	3	11.54	10	30
12-14	11	42.31	13	143
15-17	3	11.54	16	48
18-20	2	7.69	19	38
21-23	0	0	0	0
RESULTS	**26**	**100**	**65**	**308**

Source : Personal Document

From the table above it can be seen that the score with the most frequency is the 3rd class with a scale of 12-14 scores obtained by 11 people. It is known that as many as 10 people are below the average score and 5 people are above the average. So it can be concluded that students' eco-literacy abilities on the heart dimension are on average scores. The acquisition data is then classified into the criteria that have been established, and the frequency distribution is as follows:

Table 8. Categorical Frequency Distribution Table Ecoliteracy Dimensions Hands

NO	CLASSIFICATIONS	RESULTS (N)	PRESENTASE (%)
1	High	5	19 %
2	Medium	14	54 %
3	Low	7	27 %
RESULTS		**26**	**100 %**

Source : Personal Document

From the above table, it can be seen that the students' eco-literacy scores on the hand's dimension after applying the digital learning object, consisted of 7 people with low categories, 14 people with medium categories, and 5 people with high categories. Therefore, it can be concluded the frequential score is the hand's dimension in the medium score.

The results of the research showed that there was a contribution of digital learning objects to students' eco-literacy on the hands dimension. This can be demonstrated by achieving each student's score through a performance assessment assisted by the teacher as an observer. The largest frequency on the eco-literacy scores of the hand's dimensions is in the middle category. The score is known after the treatment is given, i.e. the application of DLO to the learning of Natural and Social Science.

B. Discussion

1. Use of Digital Learning Objects versus Ecoliteracy Dimensional Head (Knowledge)

The Ecoliteracy dimension of the head has a very basic position for the student. This dimension is related to the student's understanding of concepts and environmental principles fundamentally. A person with a dimension of knowledge will find it easier to understand what's going on in his surroundings. (W. B. Wijaya, Prathiwi, & Muliani, 2021). This view is also in line with Errica & Mulyadi's (2022) statement that ecologists play an important role in producing human resources that care about the environment from an early age. This view was reinforced by Wijaya (2018) who stated that the concept of ecological literacy is better introduced from the elementary school age because at that age children are experiencing rapid cognitive, affective, and psychomotor growth. An understanding of the basic concepts of the environment will be the basis of the student in managing his actions to preserve the environment.

The application of digital learning objects as a learning resource to Natural and Social Science shows positive implications for both learning processes and learning outcomes. As for the digital learning object format, this study includes infographics, video explainers, interactive videos, digital LKPD, and interactive quizzes. The selection of the entire format is the result of the researchers' analysis which refers to the general criteria of media selection stated by Riyana & Susilana (2009). These formats are external to adjustments to the learning objectives, learning materials, student characteristics, and the availability of support facilities at the research site. The application of digital learning objects to learning IPAS also refers to Edgar Dale's Theory of Experience Clusters, which is the provision of suitable tools to help students gain learning experience easily, but the tool here is a digital learning object based on a website. Sanjaya (2006) showed that the Theory of Experience Clusters provides an overview of when students experience learning in concrete terms, then the learning experience acquired will be better. So from that, the application of digital learning objects to IPAS leads to facilitating students to gain the best learning experience possible.

The use of digital learning objects to develop the eco-literacy of head dimensions through IPAS learning has its urgency as it can improve content visualization, strengthen understanding, and accommodate user interaction. This is in line with Smaldino's view in Susilana, Johan, & Rullyana (2024) that the use of different learning media in the classroom allows students to learn faster. Further research findings Karuana (2023) also proved that there was a significant improvement in students' eco-literation skills after applying environmental change animation video as a learning medium. Similar findings were also obtained by Mou (2023), who presented that video animation on science learning implies students' level of understanding and learning activity.

Based on the discussion above, the researchers concluded that there was an increased ecoliteracy of the student's head dimension (knowledge) on the aspects of analysis (C4), evaluation (C5), and creation of (C6). This is demonstrated by the pre-test and post-test gains that have improved after using digital learning objects based on websites on IPAS learning.

2. The use of digital learning objects against ecoliteracy dimensions of the heart (Attitude)

The eco-literacy dimension of the heart relates to a person's ability to care, have a sense of empathy, and be able to respect others or other living creatures. This dimension has its significance to be mastered by elementary school students as it will affect their habits towards the environment as they grow up. This is relevant with Ismail (2021), which states that the cultivation of environmental care from childhood tends to be embedded until one enters adulthood.

In this study, the attempt to develop the heart dimensions is carried out through attitude learning strategies with the Model of Consideration according to Mc. Paul cited

in Sanjaya. (2006). This model emphasizes learning strategies that can shape student personality in a positive direction. This model helps students develop the ability to live together in harmony, care, and feel what others feel (Faradita, 2017). As for learning steps in the formation of eco-literacy heart, this dimension also refers to the same source, i.e. (1) Facing students with a problem that contains conflict and often occurs in everyday life, (2) Inviting students to look at problems from different perspectives (interdisciplinary) to increase insight so that they can weigh certain attitudes according to their values, (3) Encouraging students to formulate their actions to be done according to the choice based on their discretion, (4) Instructing students to write down their responses to the problems faced.

In this study, the attempt to form hearth dimensions also refers to the theory of behavioral patterns according to Watson in Kadir. (2015). The theory emphasizes that teachers can instill certain attitudes through the cultivation process. In this study, the pattern of cultivation is done by encouraging students to engage in caring activities in their home environment. To provide a foundation of understanding, students are first given material loads with the help of DLO on environmental topics during face-to-face learning, and training efforts aimed at ensuring that the ability to care for the environment can be awakened from a childhood. The application of DLO aimed at building an eco-literacy of the heart dimension or an attitude of concern is also consistent with some previous research. As stated by Hasanah & Afianah (2021) the use of infographic media as socialization media to keep the environment can be effective and efficient for use in primary schools. The view was also reinforced by Alwasi, Nurohmah, & Prihantini (2024) who affirmed that infographics are an interesting medium to improve environmental literacy in students, by implanting environmental Literacy from an early age enabling students to have an attitude of concern for environment.

Based on the above discussion, the researchers concluded that the application of digital learning objects to IPAS learning contributes to building the eco-literacy of the heart dimension. Students showed positive responses throughout the range of learning activities to shape this dimension, as evidenced by the achievement of heart dimension scores that are in the middle category towards the dominant heights.

3. Use of Digital Learning Objects versus Ecoliteracy Dimensions Hands (Skill)

The Ecoliteracy dimension of hands relates to the ability of a person to manage all forms of action to maintain the quality of the environment. This dimension has the significance to be mastered by elementary school students because it is the benchmark for students in applying their understanding in the form of activity. This is in line with the opinion of Yulianti & Kusumaningrum (2021) that facilitating environmental literacy activities can maximize student character to enhance attitudes, skills, and morals that are not only focused on intellectual.

In this study, the attempt to form an eco-literacy of the hands dimension refers to the social cognitive theory of learning through performance. This theory states that learning through practice is a process of learning via skills that have previously been learned. (Schunk, 2012). In this study, the attempt to form the hands dimension was realized through the recycling of simple products to produce garbage and crop pots. The researchers directed the students to work in groups. The activity begins with the presence of guidance of the researchers to the students regarding the objectives and the course of the activities to be carried out. Furthermore, students are directed to access the DLO in the form of Digital LKPD and interactive quizzes on the website platform to determine the steps to be taken. Along with the students doing recycling practice, the researchers asked for the help of teachers to conduct performance assessments based on the performance observation sheets that had been compiled. The practical activities aimed not only to stimulate students to apply the knowledge acquired and produce a simple recycled product but also to create a contextual learning environment.

The application of DLO through practical activities generates positive responses because it encourages students to engage actively in learning and can stimulate students to find the relationship between knowledge and skills. This is in line with the findings of Karlina, Degeng, & Amirudin's (2017) research which states that learning activities through practice on the topic of garbage management can affect the ecoliteracy of primary school students. In addition, these findings are reinforced by Subagyo & Ningru (2022) who stated that practical activities on IPA learning can bring contextual learning and cultivate environmental skills in students.

Based on the discussion above, the researchers concluded that the application of digital learning objects to IPAS learning contributes to building the eco-literacy of the hands dimension. Students showed positive responses throughout the range of learning activities to shape this dimension, as evidenced by the elevation of learning experience which stated that 61 percent or as many as 16 students rejected the statement "I feel bored during learning". In addition, it is known that the average eco-literacy score on the hands dimension is in the medium category.

IV.   Conclusion

The use of digital learning objects in the learning of Natural and Social Sciences (IPAS) has been able to improve the eco-literacy of students in SDN 195 Isola. The improvement is characterized by the development of each dimension of eco-literacy in terms of learning aspects of knowledge, attitudes, and skills after using the digital learning object. This is demonstrated by the achievement of higher scores of learning outcomes on the aspects of analysis (C4), evaluation (C5), and creating (C6) compared to the scores before using digital learning objects. Increased ecoliteracy of the head dimension occurs as an implication of the learning communication process involving various DLO formats resulting in improved content visualization, user interaction facilitation, and increased retention of knowledge so that the learning experience acquired by students is more thorough. Reviewed against the heart

dimension, the use of digital learning objects combined with environmental care activities has been shown to contribute positively to the eco-literacy of the heart dimensions of students in SDN 195 Isola. The use of DLO in combination with the pattern of cultivation is also a specific stimulus to build an attitude of environmental concern in the pupils through the process of repetition. In addition, the presence of surveillance in the form of an individual report encourages each student to take care of the surrounding environment. Reviewed against the hand dimension, the use of digital learning objects combined with simple recycling practices has been shown to contribute positively to the eco-literacy of the hand dimensions of students in SDN 195 Isola. This condition is demonstrated by the achievement of scores in the categories that are heading towards higher levels that are more dominant. The use of DLO as a learning resource on recycling practices provides an incentive for students to engage actively in demonstration activities that are in line with the values of the eco-literacy dimensions of hands. The application of the DLO followed up with recycled practices also becomes a contextual approach to developing the eco-literacy of students' dimensions hands through simple actions.

V. References

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