Ecological Literacy In The Era Of Digitalization

Dortje L. Y. Lopulalan[1], Mike J. Rolobessy[2]

[1] Universitas Pattimura Ambon, Indonesia, Email: nor_lopulalan@yahoo.co.id
[2] Universitas Pattimura Ambon, Indonesia, Email: mikejurnida@gmail.com

A R T I C L E   I N F O

A B S T R A K

Di era digitalisasi, lingkungan hidup merupakan salah satu bidang kehidupan manusia yang kurang diperhatikan oleh sebagian besar masyarakat. Tujuan kegiatan ini diharapkan dapat menciptakan tatanan masyarakat dengan pola pikir dan cara pandangan yang kritis dan kreatif. Masyarakat dapat kritisi informasi yang diterima dari berbagai media sosial dan dapat kreatif dalam mengimplementasikan informasi yang didapatkan. Metode pelaksanaan kegiatan yakni observasi dan diskusi bersama. Hasil yang diperoleh literasi ekologis sebagai sebuah bentuk ukuran kesadaran lingkungan hidup menjadi hal yang harus terus dikembangkan melalui berbagai adaptasi metode, kondisi, instrumen, dan fasilitas yang tersedia, baik secara sistematis melalui pendidikan formal ataupun sporadis melalui berbagai media. Proses transfer pengetahuan dan informasi sendiri saat ini telah memasuki era baru yang disebut sebagai pascaliterasi. Era ini dimotori oleh perkembangan teknologi digital yang mengubah drastis moda interaksi antara manusia dengan informasi.

A B S T R A C T

In the era of digitalization, the environment is one area of human life that is given little attention by most people. The aim of this activity is expected to be to create a society with a critical and creative mindset and outlook. The public can criticize information received from various social media and can be creative in implementing the information obtained. The method of implementing the activity is observation and joint discussion. The results obtained by ecological literacy as a form of measure of environmental awareness are something that must continue to be developed through various adaptations of available methods, conditions, instruments and facilities, either systematically through formal education or sporadically through various media. The process of transferring knowledge and information itself has now entered a new era called post-literacy. This era is driven by the development of digital technology which drastically changes the mode of interaction between humans and information

INTRODUCTION

In this modern era, information can be communicated and retrieved quickly and easily. This is different from the 2010s, when communication was still difficult to obtain, we were only informed through print media, television and radio. In general, the successful use of technology can contribute to the development of various important areas of society. If these areas can develop, then the civilization of this country can also develop.

The digital era is related to digital literacy. We can define digital literacy as the ability to find, evaluate, use, and create information using digital media, communication tools, or networks, and to communicate healthily, wisely, intelligently, carefully, accurately, and legally. And the most important thing is to obey the law in order to foster communication and interaction in everyday

life. By utilizing digital literacy, we can help the development of society in various fields, one of which is environmental management.

Buchori in (Diptoadi, 1999) said that facing 21st century life requires mastery of 3 understandings, including understanding culture (cultural literacy), understanding science (scientific literacy) and understanding the environment (environmental literacy). Environmental literacy has become an important understanding or skill that needs to be mastered in the 21st century. This is also stated in the p21 framework for 21st century learning which makes environmental literacy one of the themes in 21st century learning. Environmental literacy consists of 5 components, namely; behavior, knowledge, involvement, attitudes and awareness of the environment. Environmental awareness is one of the components contained in environmental literacy (Amran, Negev, et al, 2019). A person's environmental awareness is said to originate from the environmental knowledge they possess. Someone who has good environmental literacy is considered to have good environmental awareness as well. This is important to have in this century apart from being a demand for progress and paradigm change. But also in solving existing problems and instilling a disciplined and wise attitude towards the environment. In its application, both environmental literacy and environmental awareness certainly face challenges. However, these two capabilities also have great potential for application in the 21st century.

The living environment or ecology includes patterns, order and reciprocal relationships between living things and their environment, which in its development can be used to produce basic ideas that are important in understanding the ins and outs and meaning of life (Soerjani, 1983).

In understanding ecology, it is necessary to explain the 6 underlying principles (Capra, 2007). The six principles are networks, nested systems, cycles, flows, development and dynamic balance. The first principle explains that the interaction of each natural component occurs in relationships that form a network with each component as the core. So, when one component is missing or disrupted, it will cause overall disruption. Second, nature forms a collection of systems that surround each other (nested systems). A network created in a natural system is part of a larger network or each component is another separate network. In other words, natural systems are networks of other networks. Third, every component in nature is always a resource for other components, where all processes in nature form cycles, so that everything can be utilized. Fourth, the process that occurs is always in the form of a continuous flow. Energy and material elements in nature never disappear or 'settle' in one place but always flow from one component to another. Fifth, the principle of development explains that every component in nature, especially living things, is always changing all the time where this principle is closely related to the autopoetic (self-maintaining) nature of living systems which simply says that this system always absorbs 'information' from what which he did himself. Like cells, ecosystems develop all the time, because basically every living system 'learns' from 'experience'. Finally, the dynamic principle shows that in ecosystems there are relationships that are not static or change over time.

In connection with other principles, each change will continuously form its own balance. Ecological systems certainly have many differences from human systems, so ecological principles cannot necessarily be applied directly to human life. However, ecological systems have one aspect that humans have to adapt a lot to, namely sustainability. The earth has survived for billions of years with these 6 principles, and humans should integrate these 6 principles from the level of daily life to the level of the structure of civilization. In utilizing this ecological intelligence, humans must position themselves as part of nature and be tied to the existing ecological system, and have a role in making changes in that system. This intelligence will later play a role in increasing

sensitivity to think broadly regarding consequences that are not yet visible or not felt directly and what must be done to overcome them and thereby giving birth to changes in behavior. Changing behavior to conform to nature can only be done gradually. This is due to the relativity of perception and the nature of humans who are able to learn based on their experiences. In other words, an element of education, training or special learning is needed in 'adapting' humans to live according to these ecological principles (Goleman, 2010).

Currently, in the era of digitalization, the environment is one area of human life that is given little attention by the majority of society. This is proven by the lack of public attention to environmental management. For example, in saving electrical energy in the house, poor household waste management, or in trivial matters such as saving water. This shows a lack of public insight regarding environmental preservation, especially in the energy sector.

Digital literacy should be a capability that every Indonesian citizen should have. In essence, digital literacy encourages how technological advances can be utilized for positive things by users, such as searching for, using and disseminating information that is accurate, trustworthy, useful and must be accountable for the truth according to the facts that occur. The ability to implement digital literacy which contains the role of natural resources and the environment (SDA and LH) is very important so that SDA and LH can be managed wisely (F. Rachmadi, 1996).

The start of developing a nation's literacy culture can begin with providing reading materials and increasing people's interest in reading in order to sharpen their ability to process information. So that it can improve each individual's digital literacy skills amidst the increasingly abundant flow of information. Especially those related to nature conservation efforts by more intensively accessing digital literacy that contains conservation education or creating educational content related to conservation efforts. We can start this step by providing various reading materials that are easily accessible on the internet. By providing a variety of interesting literature, it is hoped that it can increase people's interest in reading related to environmental topics.

Data and facts show that speech (oral) culture dominates literacy culture. As a result, Indonesian people have obstacles in optimizing themselves and increasing their insight independently through literacy. This low interest in literacy can hamper people's ability to explore developments in information technology in the world.

The internet is a commercial community activity that is the largest part with rapid growth beyond the borders of a country. By using the internet network, we can find out what is happening currently in other parts of the world through social media. This is a great opportunity for us to more easily reach various levels of society, in an effort to increase public awareness regarding environmental conservation. In this way, it is hoped that the community can take part in environmental preservation starting from the environment around them. So that the public understands the importance of the environment as a support and support for human life in the world.

So the aim of this activity is expected to be to create a social order with a critical and creative mindset and outlook. In this way, it is hoped that the public can criticize the information received from various social media and can be creative in implementing the information obtained. In the perspective of environmental preservation. It is hoped that the public can be critical in dealing with various information related to pollution, management and prevention related to the environment. And can implement it through changes in environmentally friendly lifestyles to avoid environmental damage and as an effort to preserve the environment for the sake of human sustainability in the future.

METHOD

The method of implementing activities is divided into several stages as follows:

- Observation (Rusli and Boari, Yoseb; Amelia, 2024). This method is carried out by reviewing literature related to ecological literacy in the era of digitalization
- Joint discussion. This method is used so that people can criticize information received from various social media and can be creative in implementing the information obtained. (Creswell, 2014).

RESULT AND DISCUSSION

RESULT

Service activities were carried out in Airlouw Negeri Nusaniwe Hamlet, Nusaniwe District, Ambon City involving Saniri Negeri and Kewang as participants in organizing ecological literacy in the era of digitalization. Saniri Negeri in the tradition of customary government and customary law in the Central Maluku region, the Lease Islands and Ambon Island includes: 1) Saniri Rajapati, which carries out government affairs; 2) Complete Saniri, which formulates various policies in the country; and 3) Saniri Besar, in the form of an accountability forum for the administration of state government. he Kewang Institution is a legal instrument of customary communities which has the task of maintaining the preservation of customary territories or what is commonly known as ulayat rights (petuanan areas). You could say, kewang is synonymous with forest and sea police. They monitor community order in managing land, supervise the use of newly cleared forest land, provide education to the community, and actively coordinate with the local government regarding land use limits. Interestingly, in carrying out their duties they are not paid a salary and consider what they do to be their calling. Saniri Negeri and the Kewang institution are legal instruments for indigenous communities in Maluku that can coordinate in protecting and preserving the environment by increasing their capacity as officers for implementing ecological literacy in the digital era.

Literacy currently consists of various types, one of which is environmental literacy. Kusumaningrum (2018) defines environmental literacy as a conscious attitude towards maintaining environmental balance and participating in dealing with environmental issues. The definition of environmental literacy according to the Minnesota Office of Environmental Assistance in Rahmah. (Rahmah et al, 2019) is a person's understanding of aspects that support the environment, environmental principles, and attitudes towards maintaining environmental conditions that are applied in daily activities. Environmental literacy also means an understanding of the environment and awareness of maintain environmental balance.

Through this understanding, it is hoped that it can be applied in real form in the form of participation in overcoming environmental problems both individually and in groups. So that further environmental literacy will build awareness of the importance of contributing to solving existing environmental problems. The importance of environmental literacy has been included in the P21 framework as a theme in 21st century education. This shows that environmental literacy has great potential in relation to the needs of the 21st century. Through environmental literacy we can instill awareness and form individuals who love the environment. Apart from that, having environmental literacy has great potential in changing the order and mindset towards the environment and as an effort to solve existing environmental problems. In line with current environmental conditions which are experiencing degradation or decline in quality. Various activities towards the environment do not pay attention to environmental ethics which causes various environmental damage. Various activities that have a negative impact on the environment

are caused by a lack of knowledge about the environment, awareness of the importance of the environment, and no thought about following up on environmental conditions. Seeing this, environmental literacy is considered important to master. Apart from environmental literacy, in an effort to face the demands of the 21st century and maintain environmental quality, environmental awareness is also needed.

The term environmental awareness is interpreted as attitudes and skills in solving environmental problems based on knowledge about the environment that one has. Environmental awareness will build a responsible attitude towards the environment (Sengupta, 2010). Environmental awareness is also defined as a deep curiosity about the environment and awareness that is reflected in every action of Neolaka in (Munawar, 2019). With environmental awareness, a person is expected to be able to develop a positive attitude in every action and interaction with the environment. According to the Environmental Awareness Ability Measure (EAAM) in (Munawar, 2019) environmental awareness has 5 dimensions including; (1) causes of pollution; (2) air, land, water and forest conservation; (3) energy conservation; (4) conservation of human health; and finally (5) conservation of livestock and life in the wild. A person's environmental awareness can be seen based on the following indicators: Indicators of environmental awareness include: (1) awareness of environmental problems: includes a measure of the information they have regarding environmental problems (2) views on environmental problems: a measure of the level of concern related to existing environmental issues (3) Environmental Optimism: includes measure of confidence in action to improve environmental quality OECD in (Amran et al, 2019). Environmental awareness has an important role in building aspects of environmental awareness and real action in paying attention to environmental problems and acting appropriately in overcoming environmental problems. Apart from having the potential to build real actions to care for the environment, environmental awareness also has the potential to maintain the sustainability of life in the future (Dasrita, 2015). So both environmental literacy and environmental awareness have the potential to build individuals who care about the environment and improve a person's quality in environmental aspects. Furthermore, this ability is an opportunity to change people's mindset so that they have personal awareness in protecting the environment. So that in the future the level of environmental damage by humans can be reduced.

Activities are carried out in an effort to ensure that the legal instruments of indigenous communities can increase their ecological literacy in the digital era, becoming a very important part of protecting the environment and its sustainability. Some ways to do this are:

a. Online Education: Take advantage of online resources, such as websites, videos, and online courses, to learn about environmental issues and solutions.

b. Social Media: Use social media platforms to spread information about the environment and follow accounts that focus on ecological issues.

c. Apps: Download apps that help you monitor and reduce your personal environmental impact, such as carbon emissions tracking apps.

d. Join Online Communities: Join online communities interested in the environment and participate in discussions and projects that support sustainability.

e. Keep Up with Environmental News: Keep your knowledge of environmental issues up to date by following the latest news and publications.

f. Sustainable Living Practices: Implement sustainable practices in everyday life, such as reducing plastic use and saving energy

1. How to improve skills in ecological literacy in the digital era

Currently we are entering an era of transition from conventional to digital, in fact most systems or jobs currently use digital things. This digital world clearly makes our activities easier. If we look at literacy skills, Indonesia still feels far below. Of 70 countries, Indonesia ranks 62nd. This means that Indonesia is one of the bottom 10 countries with poor literacy levels. This certainly requires special attention. Literacy in conventional forms is still very low, let alone having to learn more complex digital literacy. For this reason, there needs to be awareness to increase digital literacy skills gradually.

The relationship with ecological literacy is a condition where a person is aware and understands the importance or high value of the environment. The goal of Eco-Literacy/ecological literacy is Sustainable Community, meaning creating a community that cares about the importance of environmental values. The relationship between ecological literacy in the digital era is in a system that influences each other, namely the ability to understand ecoliteracy and digital literacy itself,

Ecological literacy/ecoliteracy is a process of increasing understanding, knowledge, attitudes and behavior based on ecology. Ecoliteracy seeks to introduce and renew one's understanding of the importance of global ecological awareness, in order to create a balance between the needs of society and the ability of the earth to support it.

With ecological literacy in the digital era, people, especially the younger generation, can develop greater awareness about the importance of the environment and how they can contribute to its preservation.

Ecological literacy in the digital era is important because technology plays a large role in disseminating information and mobilizing environmental action. With strong ecological literacy, individuals can be more effective in supporting environmental conservation effort.

Ecoliteracy is actually an initial stage, the next stage is the formation of ecodesign or ecological design, such as the creation of policies that balance development and nature conservation, so that we can benefit from nature as much as possible, but still maintain the quality of the environment. Then the final stage is the formation of sustainable communities that always apply environmental ethics.

2. How to increase digital literacy related to the environment

Increasing digital literacy with various information related to pollution, management and prevention related to the environment. and can implement it through changes in environmentally friendly lifestyles to avoid environmental damage and as an effort to preserve the environment for human sustainability. These steps are like:

a.Assess Digital Skills

There comes a time when you need to start assessing your current level of digital skills. This aims to find out ways and make society more attuned to the digital world.

b. Communicate the Values and Goals of Digitalization

It would be inaccurate to assume everyone has the right digital skills. Even though the younger generation such as millennials and Gen Z are quite close and have grown up with technology, that doesn't mean they really understand what digital literacy is. Likewise, ordinary people must learn

c. Measure according to needs

There needs to be a basic measurement of the use of these digital skills, then monitor progress or setbacks. This will help the team adapt, train, and provide initiatives to see whether the implementation is appropriate or not in the digitalization process.

Digital Literacy is the knowledge and skills to use digital media, communication tools, or networks in finding, evaluating, using, creating information, and utilizing it in a healthy, wise, intelligent, careful, precise and law-abiding manner in order to foster communication and interaction in everyday life (F. Rachmadi, 1996). Digital literacy is the ability to understand and use information in various forms from a very wide variety of sources accessed via computer devices (Gilster, 2007). In line with this, Bawden stated that digital literacy is the ability to access, assemble, understand and disseminate information. So it can be concluded that digital literacy is the ability and skills regarding the use or creation of information that is built through individual knowledge by considering various underlying factors, so that the individual can actually be critical as a result of his literacy (Bawden, 2008).

Today's modern society requires an individual to have the skills and abilities to face existing challenges. Mastery of technology and information can help make life easier for us, especially in society. For this reason, every individual in society must have a basic understanding of digital literacy. From here we can understand the importance of digital literacy in social life. Mainly related to an individual's ability to make better decisions and allows us to search for information, study, analyze and compare it.

This long definition shows that digital literacy does not only assess reading ability, but is more complex than that. Train critical thinking and find problem solving, build entrepreneurship, creativity, spirit of collaboration.

Digital literacy has advantages, one of which is providing easier and wider access to information. With the internet and other technology, people can explore various resources related to the environment more efficiently.

Figure 1. Communicate ecological literacy that is more in tune with the digital world.

The development of human lifestyle is directly proportional to the increasing sophistication of science and technology. Resulting in humans becoming individualistic and indifferent to the conditions of the surrounding environment. Ecological literacy/environmental literacy is a state of environmental literacy, which seeks to introduce and update people's understanding of the importance of global ecology. So that we can balance the needs of society with the ability of the earth to support it. Because of the current reality, humans continue to exploit nature to meet their living needs, without caring about nature's sustainability.

DISCUSSION

In the Maluku region in general and Nusaniwe Country in Airlouw Hamlet, Ambon City, the wisdom towards nature that is naturally present in oral traditions can be reborn in this era. Unfortunately, there are aspects that are held back by literacy residue. One of the main aspects of the reborn oral tradition is how the process of receiving the text occurs instantly without delay. The delay in question is how the literate community can convey messages across time, without having to get an immediate reaction from the recipient of the information (Ihsan, 2019). However, many important aspects of orality fail to reappear due to being blocked by literacy residue. One of them is that the oral community receives complete information on the spot spontaneously, which makes the oral community able to have a more holistic understanding of something. In line with this, the literate community can "read" through forms of prohibition in public places.

In the post-literacy era, the isolated nature of this text persists, especially with the development of increasingly sophisticated information technology. The text becomes more and more easily fragmented from the integrity of the source. In the context of ecoliteracy, this is precisely what is important. To be able to understand the principles of nature, humans must be able to see nature with a holistic-organistic paradigm, and this must be with complete interaction with nature when treating nature as a text. This means that to be able to understand the principles of nature you have to be present and merge with nature itself. This is why one of the most effective environmental education is to bring humans to live directly in nature. However, practically this is not possible, where the population has now reached a number that really requires space efficiency.

Another alternative to this is to optimize all the potential of the post-literacy era, where texts continue to transform, even beyond hypertext. Some aspects of Industry 4.0, such as artificial intelligence and argued reality, are radically revolutionizing text, taking it far from being literary. For example, virtual reality technology which has begun to be accessible to general consumers can now present text in a more complete manner, where the visual information presented is multi-directional, thus building a single perception, compared to previous technology where visual information was limited by a limited screen size.

Environmental awareness will never be perfect, making ecoliteracy not an easy thing to do in the post-literacy era. Perhaps it would be naive to hope that environmental awareness can be totally instilled in this era, especially if the ideal form is oral community wisdom that has made natural principles a natural thing in everyday life. The concept of sustainability will indeed remain an external concept that needs to be built artificially through various knowledge and strategies because it will never be able to reintegrate naturally as a principle of daily life. The only option then is to optimize all remaining aspects of orality while simultaneously suppressing some of the residual literacy that hinders the strengthening of environmental awareness using available technologies. The inhibiting literacy residue in question includes a way of textual thinking that makes human-nature relations still considered subject-object rather than intersubjectivity. The big goal is to replace the modern mechanistic paradigm that has already become established with an organic-holistic paradigm towards nature. Literacy culture, like it or not, becomes an agent of the mechanistic paradigm because literacy culture encourages analytical thinking, where things are separated rather than seen as an organic whole. In the end, ecological awareness will always be something that must be forced because it is almost impossible to present it naturally. On the other hand, technological developments promise many benefits that can be optimized for the forced cultivation of ecological awareness.

Ecological literacy in the digital era is an individual's ability to understand, analyze and participate in environmental issues using technology and digital resources. This involves:

1. Understanding Environmental Issues: Understanding environmental issues, such as climate change, biodiversity and pollution, and their impact on the planet and human life.
2. Technological Knowledge: Using digital technology, such as the internet, applications, and social media, to access and disseminate environmental information.
3. Information Criticality: Able to assess the truth and accuracy of environmental information found online, and avoid the spread of false information.
4. Participation in Environmental Action: Get involved in activities and campaigns that support sustainability, such as online donations, petitions, and volunteer actions.
5. Reducing Personal Impact: Using technology to reduce personal environmental impact, for example by monitoring energy consumption or shopping sustainably.
6. Education and Awareness: Using digital platforms to spread information and education about environmental issues to others (Arini, Niken. 2019).

Ecological literacy in the digital era is important because technology plays a large role in disseminating information and mobilizing environmental action. With strong ecological literacy, individuals can be more effective in supporting environmental conservation efforts. How to increase awareness of ecological literacy in the era of digitalization :

1. *Online Education Campaign:*
   - Create educational content such as articles, infographics and videos that explain the concept of ecological literacy in the digital era.
   - Use blogs, websites and social media platforms to disseminate information widely.
2. *Online Training:*
   - Provide free online courses or training on sustainable practices in the digital era, such as e-waste management and energy efficiency.
3. *Collaboration with Influencers:*
   - Involve influencers or well-known figures on social media who care about the environment to help convey the message of ecological literacy to their audience.
4. *Online Community:*
   - Form an online community that focuses on ecological literacy, where members can exchange information, experiences and ideas regarding sustainable practices
5. *Digital Tree Planting:*
   - Promote a digital tree planting campaign as a symbol of contribution to the environment, by utilizing special platforms or applications.
6. *Partnerships with Schools and Colleges:*
   - Collaboration with educational institutions to integrate ecological literacy in the curriculum and organize educational activities
7. *Wise User Campaign:*
   - Teach wise user practices in the use of digital technology, including how to reduce carbon footprints and digital environmental impacts.
8. *Monitoring and Evaluation:*
   - Monitor the effectiveness of the campaign by measuring the level of community participation and understanding regarding ecological literacy.
9. *Support from Government and Business:*
   - Call on governments and companies to support ecological literacy initiatives with sustainable business policies and practices.

10. *Easy Access to Information:*
   - Ensure information regarding ecological literacy is easily accessible via various digital platforms, including mobile applications and responsive websites. (Kompasiana.com, 2021)

Figure 2. Online education campaign

CONCLUSION

Understanding and awareness of the environment as a whole determines how humans will interact with nature, thus becoming an important aspect in the sustainability of human civilization. Ecoliteracy, as a form of measuring environmental awareness, is something that must continue to be developed through various adaptations of available methods, conditions, instruments and facilities, either systematically through formal education or sporadically through various media. The process of transferring knowledge and information itself has now entered a new era called post-literacy. This era is driven by the development of digital technology which drastically changes the mode of interaction between humans and information.

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Ecological literacy given to traditional community legal instruments, namely Saniri Negeri and Kewang institutions, can be interpreted as meaning that there is a cultural transformation of society based on interactions that present ecological awareness in a natural, complete and perfect way, so that what can be done is to optimize the potential of this digital era to instill ecological awareness in a natural way. artificially through various technologies.

Figure 3. Collaboration with Influencers

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