Research Article

E-Government Efforts Through a Culture of Intranet Use E-Learning Green Computing in Environmental Schools as a Solution to Prevent Global Warming (A Paperless Study on Integrated Environmental Education-based Schools at SDN Lowokwaru 2 Malang)

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Abstract.
Global warming is a serious environmental problem, one of the causes of global warming is the cutting down of forests to produce paper. Paperless evaluation in elementary schools can be a revolutionary solution to prevent global warming. The purpose of this study is to describe and analyze the success of paperless culture and measure the strength of factors on the routine use of e-learning green computing intranet in Adiwiyata schools. Previous studies have mostly discussed the impact of environmental learning on students' awareness of the importance of protecting the environment. This research can provide new information on preventing global warming of paperless evaluation routine culture. This research uses a qualitative approach. Data were collected through interviews, observations, and documentation. Research question one used interactive analysis and research question two used Force Field Analysis (FFA). The results of this study found that the success of the paperless evaluation routine can shape the e-government character culture. The conclusion is that paperless evaluation can save one tree every year because the supporting factors are powerful and greatly contribute to preventing global warming.

Keywords: e-learning, computing, green, intranet, paperless

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1. Introduction

It is predicted that by 2045 there will be even more significant forest loss [1]. Indonesia's forests are very important for the survival of Indonesian people, if Indonesia's forests run out, it is a very serious threat. In line with IPCC [2] the rate of global warming is a disaster for the Indonesian region. According to Margono et al. [3] it is explained that the reduction of Indonesia's primary forests has a significant impact on climate change efforts.

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Schools consume paper because learning evaluation media in Indonesia still use paper even though during the COVID-19 period learning is online [4]. This is corroborated in the paper-based learning process [5]. Measurements still use the paper method, as in the explanation [6] portfolio assessment processes the needs of teacher certification and school administration. Conventional assessment to online cannot be done optimum basic institutions. According to Femilia [7] electronic assessment is the application of wise and environmentally friendly technology. Research results [8] show that it has a positive impact on the importance of reducing the use of paper in learning environmental sustainability.

Adiwiyata is a government program implemented in Indonesian schools to prevent global warming [9]. The international education journal explains that the Penta Helix approach between government, academia, business, environmentalists, and the media can be used as a culture in protecting Indonesia's nature [10]. According to Zhou et al. [11] electronic evaluation can reduce paper usage. Intranet e-learning green computing can be used in a paperless form. In line with Al Sadoon [12] in his journal explained the use of Green Computing towards healthy environmental management. An intranet is a local network with a model that is effective, efficient, inexpensive, and sustainable [13]. At SDN Lowokwaru 2 Malang, already has a green computing e-learning intranet network with a star network topology and is an independent Adiwiyata school that has implemented paperless learning assessments.

It is like a journal in the environment [14] that Indonesia's natural resources are green investments that must be managed properly in the development and use of energy. So all parties must be able to maintain and preserve Indonesia's forests to prevent global warming [9]. The problem of global warming is a serious threat because many schools are still conventional and have difficulty in using paperless evaluations, therefore this study reveals how to use intranet e-learning green computing in an effort to prevent global warming through methods of reducing paper usage.

This research aims to describe and analyze the success of the routine culture of using e-learning green computing intranet in learning evaluation and analyze the supporting and inhibiting factors in the effort to implement paperless. The benefits of this research can enrich scientific insights in the field of environmental education [15]. The use of green computing e-learning intranet can be replicated by other schools and used as a reference because it is paperless [16]. Advantages and continue learning after the COVID-19 era. In Taylor et al. [9], the Indonesian government is obliged to prevent global warming paperless routines. With the routine of using intranet e-learning green

computing in paperless evaluation, SDN Lowokwaru 2 Malang contributes to preventing global warming by saving one tree per year from being cut down.

2. Methods

This type of research uses a qualitative approach [17]. Population and samples at SDN Lowokwaru 2 Malang because Adiwiyata is independent. Focus one is analyzed interactively consisting of data reduction, data presentation, and conclusion drawing. Interviews with informants in this study were: (1) Principal; (2) School Committee; (3) Technicians and operators; (4) Class teachers; (5) students from grade 1 to grade 6 [18]. The second focus of this research uses Force Field Analysis (FFA) [19]. Force Field Analysis (FFA) is used to measure the strength of supporting factors and inhibiting factors. The method of collecting supporting and inhibiting factors according to Benjamin [17] is done through observation, interviews, and documentation, to get an in-depth picture.

3. Results and Discussion

3.1. The routine of using the green computing e-learning intranet in learning evaluation

The Adiwiyata title is given to schools that have participated in environmental competitions in Indonesia [20]. In 2022 SDN Lowokwaru 2 Malang was declared an independent Adiwiyata school [21]. In the field, activities are optimal in preventing global warming issues. This is shown in the implementation of paperless evaluation. According to Gyamfi [22] in his journal which explains that the role of Information and Communication Technology is important for the preservation of the natural environment. There are teachers at SDN Lowokwaru 2 Malang who conduct paperless evaluations. The Adiwiyata school policy provides the widest possible learning by integrating the environment [23] this is used as a paperless evaluation policy. According to Triatmaja et al. [24] in his journal explains that e-learning can be used in environmentally friendly early childhood learning. The number of subjects conducted conventionally and paperless Table 1 below.

The results of in-depth interviews with the Principal of SDN Lowokwaru 2 Malang, Informatics subjects have implemented electronic-based exams (paperless). This is in line with what was conveyed by the computer teacher as well as the initiator of the

TABLE 1: Conventional and paperless subjects.

Lesson Year	Number of Classes	conventional	paperless
2020/2021	20	9 Subjects	1 Subjects
2021/2022	20	10 Subjects	1 Subjects
2022/2023	20	10 Subjects	1 Subjects

paperless exam in the field of Informatics at SDN Lowokwaru 2 Malang for informatics subjects has conducted paperless assessments since 2014. The School Committee said that in order to reduce school operational costs in the field of paper procurement, the school must be able to transform the evaluation from conventional to paperless. Computer and Network Technician Staff emphasized to teachers to be able to utilize computer technology to minimize learning evaluation correction activities. Although the Malang City Education Office has not issued a paperless learning evaluation policy, SDN Lowokwaru 2 Malang is optimally paperless in learning evaluation.

Discussion the routine of using the green computing e-learning intranet in learning evaluation. In his journal, the paperless routine of the COVID-19 era is to maintain sustainability [13]. Wu et al. [25] in his journal explains about building a sustainable company. SDN Lowokwaru 2 Malang is optimal in efforts to preserve and protect the environment through a paperless evaluation culture in informatics lessons. This can be proven in every assessment activity in the field of informatics lessons is paperless, so every year it can save one tree not cut down. This is in line with Azeiteiro [26] and Caglar [27] that the use of e-learning in the form of learning evaluation is an effort towards sustainable development. The paperless evaluation culture is carried out continuously because SDN Lowokwaru 2 is an independent Adiwiyata school. According to Volkovitckaia [28] in his research explains that the digital generation requires the formation of digital characters, so in this case, SDN Lowokwaru 2 Malang has formed the character of the e-government cultured generation in preparing paperless-based administrative actors in Indonesia and trying to prevent global warming at school through paperless evaluation.

3.2. Supporting and inhibiting factors in paperless implementation efforts

According to Kelly and Booth [29] in his research, it is explained that there are supports and challenges. Force Field Analysis (FFA) is carried out to determine support and obstacles, as follows:

3.2.1. Supporting factors

(1) Government Regulation on the Education Unit Level Curriculum (KTSP) [30] article 3 paragraph (2) letter (k) on the dynamics of global development, states that schools can carry out curriculum development in accordance with global demands. It is expected that the operational curriculum developed and implemented by the education unit is made to prevent global warming. Where the school determines an independent attitude towards caring for the environment [31]. So the existence of regulations and policies is given a score of 5 (very strong); (2) Hardware availability; availability of infrastructure such as servers, intranet networks, internet networks, bandwidth, personal computers, laptops, administration rooms, computer laboratories, computer exam room laboratories are present and complete. This affects the success of paperless evaluation so this factor is given a score of 4 (strong) because infrastructure has an important role in the successful implementation of intranet culture learning at SDN Lowokaru 2 Malang, this is in line with research [32]. (3) Human Resources (HR) This factor is given a score of 3 (strong enough) because SDN Lowokwaru 2 Malang has one operator recognized by the CISCO Networking Academy who successfully handles 20 classes, which is a big and professional responsibility. Some teachers at SDN Lowokwaru 2 Malang are not yet experts in computer skills; (4) Availability of operational costs is given a weight of 3 (strong enough) because the availability of operational funds exists, this is because the local government provides a budget of 0.9% of the overall school improvement budget.

3.2.2. Inhibiting factors

(1) Commitment changes in the implementation of the school's vision and mission in the Education Unit Level Curriculum (KTSP) because every time there is a rotation of school leaders, it becomes one of the factors inhibiting policies and regulations. Where the new leadership will bring its superior programs. From the data above, it is clear that school leaders do not only prioritize one program but prioritize the needs according to school conditions. This shows that the inhibiting factor is strong so the researcher gives a score of 5 (very weak); (2) Hardware management plays an important role in the inhibiting factor. It is proven that SDN Lowokwaru 2 has adequate equipment, but it is not used for all subject evaluations. In this factor, the researcher gave a score of 4 (very weak); (3) Quality of Human Resources (HR), in observation and in-depth interviews, the researcher obtained data that many older educators did not know about

the green computing e-learning intranet, in the paperless evaluation process, therefore the researcher gave a score of 2 (very weak); (4) Management of operational costs; the researcher obtained the results that the management of school operating costs was only used to finance other environmental activities such as green school competitions, quality culture competitions, other competitions, therefore the score was 3 (very weak).

Discussion of supporting and inhibiting factors in efforts to implement paperless. According to Engstrand [33] The role of e-learning is highly recommended in education management because it follows the times and is environmentally friendly. The strength analysis design of supporting and inhibiting factors looks like Figure 1.
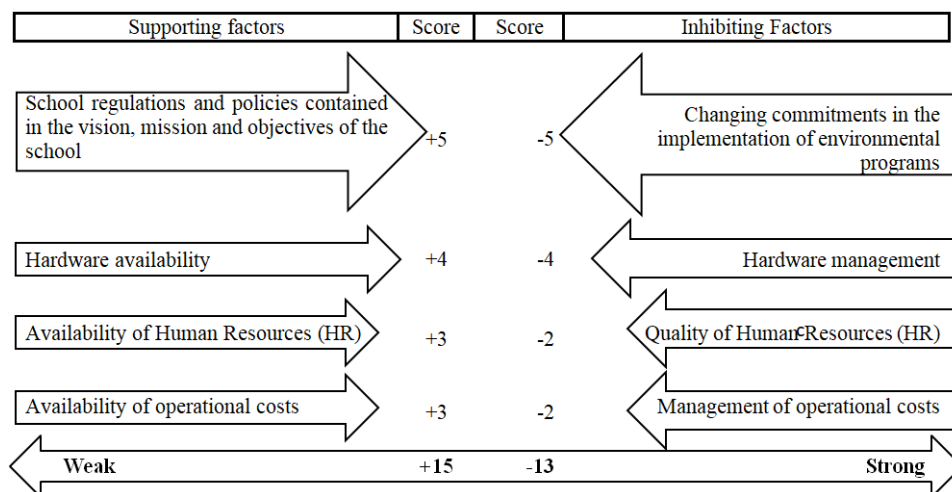
Supporting factors	Score	Score	Inhibiting Factors
School regulations and policies contained in the vision, mission and objectives of the school	+5	-5	Changing commitments in the implementation of environmental programs
Hardware availability	+4	-4	Hardware management
Availability of Human Resources (HR)	+3	-2	Quality of Human Resources (HR)
Availability of operational costs	+3	-2	Management of operational costs
Weak	+15	-13	Strong

Figure 1: Supporting and inhibiting factors in efforts to implement paperless evaluation through intranet e-learning green computing.

The data above shows that in efforts to implement paperless evaluation, through intranet e-learning green computing at SDN Lowokwaru 2 Malang, the supporting factors are stronger. Same with the journal [34] that making paper not from trees is a new necessity. In the journal [35] explains the paperless policy is a form of preserving the natural environment. So with the basis of research on paperless policies and paper derived from wood in the forest, e-government efforts through the use of Intranet e-learning green computing are going well because doing paperless evaluations is one form of activity to prevent global warming, which is proven by saving one tree per year.

4. Conclusion

E-government efforts through a culture of using intranet e-learning green computing in environmental schools as a solution to prevent global warming at SDN Lowokwaru

2 Malang, concluded that: (1) the activity is successful because it is shown through a culture of paperless evaluation routines; (2) supporting factors in paperless evaluation are very strong. This activity is part of an effort to prevent global warming because every evaluation by paperless can save one tree per year. As a suggestion, government support is expected, the program can be used as a school statute in preventing global warming.

Acknowledgments

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