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Leadership in green school practices: a case study of the principal's roles towards reducing global warming risk in Lampung, Indonesia

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Abstract. The implementation of green schools is a starting point for developing environmental awareness and responsibility, begin with educating students in a healthy and sustainable environment. In this perspective, principal leadership will contribute to embody green school with increasing the pro-environmental attitudes, clean and healthy living behaviour, and habits of individuals, whether at home, or in school. The main aim of this study is to review research evidence and a conceptual framework of the school leadership that contribute to build sustainability school. The design of this study is qualitative approach with case study method in Lampung Province, Indonesia, specifically in the North Lampung District. This study presents results from interviews, observation, and documentation analysis. We sought to understand how role model and school culture provide education service with a particular interest in the physical built environment of this unique school. We found, however, these factors supported school's ability to develop and maintain green school and linked to the principal's actions as school leader. These factors are important for school improvement, especially for schools in disaster-risk areas, communities are increasingly asked to improve students' awareness to environment.

1. Introduction

Indonesia is a country located along the Indian Ocean where the four tectonic plates-the Australian, Philippine, Eurasia and Pacific plates-meet. Indonesia as one of the world's most highly disaster-prone countries often faces multiple hazards resulting in natural disasters such as earthquakes, tsunamis, volcanic eruptions, floods, landslides, drought, and forest fires [1]. However, these environmental issues are mostly human-caused that damage the ecosystem. Climate change, environmental degradation, and excessive energy consumption need to be reduced by changes in beliefs, attitudes, and environmental values of human resource behaviour [2]. In the promotion of environmental sustainability, thus, education can play a significant role in creating an environmentally literate society and providing solutions to the environmental crisis [3].

In this case, school as a learning organization, providing understanding to students about needs and human activities, ecosystem, and determined efforts to conserve energy and water, or to reduce waste [4]. Sustainable schools offer educational services that build relationship between the environment and local community which impacts on school culture and meaningful learning for students [5]. The implementation of green schools is a starting point for developing environmental awareness and responsibility begins with educating students in a healthy and sustainable environment.



The role of green school is inseparable from the aspects of the principal's leadership as the driving force in its implementation [6]. Principals establish educational leadership policies and standards to design school models that can accommodate student's learning and socio-ecological needs [7]. The achievement of green school culture stems from the school communities' commitment to realize their vision of the environment-friendly school. In this perspective, principal leadership will contribute to embody green school with increasing the pro-environmental attitudes, clean and healthy living behaviour, and habits of individuals, whether at home, or in school.

To date, much of the research on the green schools have focused on those factors relevant to the particular theoretical or focus (see, for example Cole & Altenburger, 2017; Kerlin, Santos, & Bennett, 2015). However, through reviewing articles and literature, there was a lack of information detailing the leader's roles and responsibilities in green schools [6], especially in Indonesia. By presenting a practical approach to green school, based on case studies, this study will begin to address this knowledge gap.

The main aim of this study is to review research evidence of the school leadership roles that contribute to build higher-performing school. Sustainable leadership builds an educational environment through participation within the school community. It is on this practice that the green leader can be considered as a role model to support and promote sustainability for schools that have not been implemented green school consistently. The case study described in this study takes one of the public secondary schools in Lampung Province, Indonesia, especially in the North Lampung District, considers the extent to which success has been sustained and then, through qualitative research procedures, it considers the role of leadership in maintain green school.

2. Method

This study use qualitative approach with case study method. Data collection is done in a school which has National and Province Adiwiyata (Eco School) status in North Lampung, Indonesia by involving 15 informants that includes principal, vice principal, teachers, administrative staff, students, custodians, and partnerships. Data collection is done through interview, observation, and documentation analysis. Individual interviews with the principal, three vice principals, one curriculum coordinator, three other teachers (one as 7K coordinator), head of administration, head of secondary schools division at education office, several students at seventh and eighth grade (one as student council president), and two student parents. Observation of the work of the school principal and aspects of the life of the school; observation of school events (sport activities, classrooms in action, green school activities, etc) were used to verify views expressed in the interviews about the principal's leadership behaviour, and the relationships processes and practices of the school. The researcher used field notes to record observations and responses to events. In addition to interview and observational data, relevant documents were collected such as school development plans, school partnership documents, staff list, green school reports, school rules, and other documents. These sources were used to contextualise the empirical data and to enhance trustworthiness.

3. Result and Discussion

By beginning the process with a literature review and pre-observation, introductory ideas were raised and helped the researcher in building observation ideas and interview questions that were in line with the principals' experience. The end result of this process was the identification of four factors central to carry out the green schools, (1) role models, (2) school governance, (3) school culture, and (4) school facilities together supported both conservation and environmental education, specifically through the application of principles from behaviour theory, including modelling commitments, values, expectations, and behaviours [8]. Each is discussed in detail below.

3.1. School Profile

The school selected for the study is one of 114 schools serving 824 students with an enrolment of approximately 300 students in the year. There were 72 staffs, including 57 teachers and various support staff. The school is situated in a residential and commercial section of the city. As a green school certified, the school's performance on the state's standards-based exam has been great that received the certification of high performing school by Ministry of Education and Culture and already won a national healthy school standard.

3.2. Role Model

The principal's involvement in the initial stages of green school development is crucial. Most leaders want to do things that matter, to inspire others to do it. Sustainable leadership needs to become a commitment of all school leaders and be a fundamental priority of the systems in which leaders do their job [9]. The key distinctions from the school are the achieved vision and values of the school, and the perceived principal roles. The school leader in the case school was generally proactive in attitude to change. The principal of the school is committed to creating a green and healthy learning environment for students. She stated:

I, as the principal, become a role model in reflecting the attitude of clean and healthy life, for example, I picked up wastes and threw them into the trash so that it encouraged other members to do so. The main thing is to instil awareness in ourselves, so people will do the same thing.

Staffs within in this case study were working in school where the principal held a number of clear—and shared—educational values and beliefs. They were principled individuals with a strong commitment to their 'vision', determined to do the best for their school, particularly for creating a comfortable, cool and healthy learning environment. For the principal, the main role of teachers was seen to be a good presenter of learning. What the principal of school said, is explained it well. The principal expressed:

From the beginning it was conveyed to the teachers that their behavior would be an example for students. Everything starts from ourselves and then fosters student awareness. All school people build good collaboration to maintain the green school. I evaluated teacher cleanliness attitudes and always reminded them to tidy up their desks... and cleaned up the teacher's room then arranged a time schedule for the teachers. Besides, we always instill students' sense of belonging so that they will continue to maintain class cleanliness and school facilities

The principal models environmentally responsible behaviour for both students and teachers. Principal is described as being an inspiration because of her dedication to educating students on conservation issues. Students said that principal taught two key things—the importance of environmentally responsible behaviour and that they could make a positive difference in the world through their actions. Teachers spoke of the principal as an important role model and motivator for their own behavioural change. As one teacher said:

The principal do not hesitate to reprimand us if we did not maintain cleanliness. She frequently walked around the school to check the school environment, also at any time she checked the cleanliness of the class and if it was dirty, she would stop learning briefly to clean the class.

School principals as a community leader led to trust and rapport between school and community manage school relations with parents, the community, and other education stakeholders [10]. Communication appears to be an important thread linking the school goals. In this case school, the principal built multi-directional communication to the school community—when communicated effectively—impacted school culture and further shaped behavioural change. Interpersonal communication is important tools for both education and behaviour change related to sustainable behaviours. As one teacher said:

Principal diligently communicated and coordinated with the teachers and staff. Important things that need to be planned are discussed at the monthly meetings including evaluation.

According to Hariri research (2014), school leadership is important for school effectiveness, to prepare students to achieve their future success. School leadership is inseparable from principal decision-making styles that help principals to function well in making a decision. Decision-making style a leader displays depends on certain contextual variables [11]. Building positive relationships was her approach to improving teacher morale and commitment, and establishing community support. In terms of her leadership style she was described as a positive role model, inspirational, participative, and charismatic. One described the principal is firm and disciplined and said that her charismatic leadership is very important in successfully motivating behavioural change. As one experienced teacher remarked:

So far, her leadership has been very good, meaning that she could be a model for other schools to implement the green schools. She maintained the predicate of green school and made it superior. She accommodated the aspirations of the teachers well.

As concluded by Gough (2005) that sustainable school strategies encourage school citizens and communities to develop students' leadership skills, relationship skills, social responsibility, self-esteem and sense of belonging. The researcher also added that teachers have developed pedagogical skills, knowledge and strategies for working with the community. The whole school community has developed social patterns through working together, social relationships, opportunities and ownership and pride in the school as well as adopting sustainability practices at home [12]. The interview and observational data collected from this study that principal plays a variety of roles especially in a green school. While it was apparent from the data collected for this study and from the literature, the principal's focus approach on human resources (teachers, parents and students) remained central to how she worked. Learning about the roles and responsibilities of green school principal was vital to understanding what they do on a day to day basis. A key aspect of the green school is its ability to educate its students on the importance of sustainability, and that lesson extends outside of the schools.

3.3. School Governance

Participatory governance also helped learning by enhancing a sense of both individual and group efficacy [8]. The management of the school reflects and reinforces what students learn in the classrooms through the ways in which it runs the school (use of energy and water, transport and travel, food, etc.), and learning is further strengthened by the ways in which the school and its students learn alongside local and more distant communities [13]. Further, Rahman & Maulina, (2019) explained that school is the smallest environment that best knows how to educate students to have a green character. Student's activities in school can also be controlled, both by fellow students and between students, teachers, and school employees. When one element of the school community does what does not reflect the green character, the other elements will immediately remind them to act in accordance with the objectives of the green school. If this is accustomed, along with the passage of time all elements of the school community will have habits that eventually form a green character. Therefore, the authority of schools to manage and develop their own green school-based management needs to be given [14].

In the case school, the curriculum is a national standard, and teacher-designed lesson plans. Environmental education was formulated in education unit curriculum (in Indonesia, called K13), and developed in school budget plans and activities (RKAS). In its implementation, environmental education required teacher competence standards to develop environmental learning activities. While there was no special environment-based curriculum, the school attracted a group of committed and energetic teacher and staff to engage in sustainability education across subject matters.

The sustainability is taught across the curriculum in areas and integrated in lesson content such as social and science. It stretched from the study of the on-school stream in science making hydroponic plants and composting, drawing geometries in mathematics, to painting classroom and making crafts from trashes in art, and many others. The principal commented:

Through indicators and basic competencies, all subjects are linked to maintain the environment and healthy living behaviors. In extracurricular activities, the meaning of the environment is emphasized.

In response to this comment, vice principal added:

Actually there is integration in the syllabus. That required creativity from teachers, how they made innovation in learning that led to the environmental education, and we here, did it.

While there was no sustainable curriculum outside the classes, principal and teachers played a critical role in advocating for the green behaviors and environmental issues. As explained by Abdurrahman, et al., (2018) that the teachers facilitated the students achieving the expected set of competence developed in the model, either inside or outside classrooms. The parents gave inputs and considerations to for the school and teachers in integrating environmental and disaster literacy into the local curriculum and played a role as active observers of the teaching learning process. Subsequently, both teachers and parents did reflective activities after the learning to fix the students' learning activities for the betterment of their learning. Further, the case school is likely to connect themes of democratic and participatory school governance with the 'environmental sustainability' frame. This study provides evidence for both the choice possibilities and limitations environmental learning in case school. The school building was designed with the intent to engage users with green buildings, although school had no an explicit green building curriculum.

3.4. School Culture

School culture is an important venue through which environmentally responsible behavior can be modeled and learned [8]. Principal believed that be a role model in the school, her current role has allowed to creating a culture that values the environment, the way that she would like it to. A major change considered by the principal as a result of the participation in the green school is a significant change in the school climate. Students' and teachers' participation in the implementation of different activities has led to the development of better relationships of trust and cooperation both between students and between students and teachers.

The application of case school is by planting various plantations such as flowers, vegetables, fruits, or herbal plants. The planting uses several methods such as vertical garden, hydroponic, green house, and this circumstance will beautify school itself. Students clean the class before class begins and after school time is finished according to the student's clean duty schedule. The principal also added:

Within a month, we do a clean and healthy lifestyle every Friday. The first and last week we take a Green Walk. Friday on the second week, the activities are Friday Clean then on the third week we do exercise together.

The ecological principle cycles calls for reductions in human-produced waste delivered to landfills. School leaders institutionalize reduce, reuse, and recycling systems, composting program, water and energy efficient practices throughout the school.

Usually, waste is just throwing away without sorting or recycling process. Through the development of Waste Bank system, the students will get moral lesson on how we deal with waste and involve in learning how to compost organic waste or monitor energy usage with turn off the light and water after use.

Humans respond more positively to biotic change strategies consistent with life's organizing principles [7]. Hence, the green school development through cooperation of principal and teachers can

be realized as principles and rules of environmentally education development. school as basis place for character builder which synergized environment sense inside is demanded to comprehend not only academic subjects, but also becomes role model for the future humans who pro and care with the environment.

3.5. School Facilities

The school building is designed to support all aspects of the school's mission, including the theme of environmental stewardship. Facility maintenance is carried out by all school members automatically. School leader always emphasized to teachers and students to take care of and not damage school facilities. Aesthetically, the school communicates a message of harmony with nature, which is achieved with deep earthy colors from plants such as fruits, vegetables, and flowers. The school introduces various green features to the building, including: a greenhouse, healthy canteen, school garden, school park, Bio-pore Infiltration Hole (BIH), composting space, and waste Bank.

Schools are organizations which produce waste and consume significant quantities of resources, contributing to global warming [13]. Thus, implementation of green school has been very helpful in efforts to reduce waste at schools and surrounding; the better treatment is recycling system [15]. The case school provided separate bins for the rubbish (e.g. organic, inorganic, and hazardous or toxic wastes), composting and final disposal space, and it implemented 3R program (Reduce, Reuse, and Recycle) for the garbage at schools and surrounding. The principal explained:

Waste is processed into compost and art involved teachers and students. We sell unprocessed plastic trash, that done by the 7K teacher in more detail. Actually this school do not have plastic waste because we implemented healthy canteens so it is not permitted to sell packaged food and drinks. I really nudged us to get rid of plastic cups in the school. As you can see, we do not have plastic cups in the building. The canteen provides food and drinks served on plates and glasses. Most of the paper waste that is weighed and sold to the wrecker, and the proceeds of the sale are used to make crafts.

While examining school missions, it is illuminating to further consider that the school in this study adopted sustainability into their core missions and the design of the school. The result was a cascade of decisions that all supported the creation of a green environment including adequate green facilities. The primary goal of school leader is to make sure that instruction takes place on a daily basis in every clean classroom and that every child gets to the best service that they can take. Thus, it is posited that learning spaces designed for sustainability reflect pro-environmental values that can in turn inform pro-environmental values in children [3].

4. Conclusion

Based on the results and discussions, it can be concluded that the case study revealed four factors that supported school's ability to develop and maintain green school. These factors were (1) role model, (2) school management, (3) school culture, and (4) school facilities. These factors were linked to the principal's actions as school leader. The ability to maintain a school environment where teachers and parents focused on students' environmentally responsible behaviours; to model a genuine openness to school community involvement the school's concerns; and to support other principals in developing sustainability school leadership. This study, thus, supported the school's efforts to provide a friendly learning environment for its students. These factors are important for school improvement, especially for schools in disaster-risk areas, communities are increasingly asked to improve students' awareness to environment.

Unlike many schools, however, the case school has district support for its leadership. The government's focus on those factors as a strategy for school improvement allows principals to prioritize leadership in a way that might not have been done in other schools. Of course, this research is limited by its very nature as a single case study. While individual cases can offer rich descriptions, answer how and why questions, and provide propositions for new theory, they also tend to propose more complex theories than can be. This case study suggests that leadership plays a vital role in the green school improvement process. To achieve it, however, schools need guidance and support to create appropriate

contexts for leadership in sustainable school. Principals need assistance in understanding the roles of the secondary school principal, running school management, providing supporting facilities, and creating school cultures that encourage and support such collaborations. Furthermore, district-level facilitators provided on going professional development. School staff and faculty need professional development and staff training to understand their role in embodying green schools. This kind of guidance and support from district government leader can help all schools, especially those in disaster-prone areas.

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