

ORIGINAL

Managing Resistance for Sustainable Green School Transformation through Green Growth Education

Gestión de la resistencia para la transformación sostenible de las escuelas verdes mediante la educación para el crecimiento verde

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ABSTRACT

Introduction: the realization of a sustainable lifestyle has become a global development priority, making environmental issues a primary concern. Schools play a strategic role in achieving this goal through the development of green schools. This study aims to analyze the influence of green growth and school development on resistance management in the implementation of green school initiatives.

Method: this study employed a quantitative research design. Data were collected through a questionnaire that had been tested for validity and reliability. The population consisted of vocational high school development teams across 11 sub-districts, covering a total of 14 schools. A proportionate random sampling technique was applied, resulting in a sample of 168 school planning team members. Data analysis was conducted using Structural Equation Modeling-Partial Least Square (SEM-PLS), with all variables passing validity tests.

Results: the findings reveal that the development of green schools using Lewin's change theory (unfreezing, changing, and refreezing) proved effective ($M=77,658$). There is a significant relationship between school development based on Lewin's model and the implementation of green schools (program and learning) on Resistance ($p<0,005$). However, the changes and developments also generated resistance, largely due to entrenched old habits and concerns over the ability to compete. Another result indicates that green school development can directly lead to resistance.

Conclusions: the study concludes that while green school development contributes positively to sustainable education, it also faces challenges of resistance rooted in cultural and behavioral patterns. To ensure effectiveness, the development process requires mediation through comprehensive green school programs involving all school members, particularly teachers and students.

Keywords: School Development; Resistance; Green School.

RESUMEN

Introducción: la consecución de un estilo de vida sostenible se ha convertido en una prioridad de desarrollo global, convirtiendo las cuestiones ambientales en una preocupación primordial. Las escuelas desempeñan un papel estratégico en la consecución de este objetivo mediante el desarrollo de escuelas verdes. Este estudio busca analizar la influencia del crecimiento verde y el desarrollo escolar en la gestión de la resistencia en la implementación de iniciativas de escuelas verdes.

Método: este estudio empleó un diseño de investigación cuantitativo. Los datos se recopilaron mediante un cuestionario cuya validez y fiabilidad se evaluaron. La población estuvo compuesta por equipos de desarrollo de escuelas secundarias vocacionales de 11 subdistritos, que abarcan un total de 14 escuelas. Se aplicó una técnica de muestreo aleatorio proporcional, obteniendo una muestra de 168 miembros de equipos de planificación escolar. El análisis de datos se realizó mediante el Modelo de Ecuaciones Estructurales-Mínimos

Cuadrados Parciales (SEM-PLS), y todas las variables superaron las pruebas de validez.

Resultados: los hallazgos revelan que el desarrollo de escuelas verdes mediante la teoría del cambio de Lewin (descongelación, cambio y recongelación) resultó eficaz. Existe una relación significativa entre el desarrollo escolar basado en el modelo de Lewin y la implementación de escuelas verdes. Sin embargo, los cambios y desarrollos también generaron resistencia, en gran medida debido a viejos hábitos arraigados y a la preocupación por la capacidad de competir. Otro resultado indica que el desarrollo de escuelas verdes puede generar resistencia directamente.

Conclusiones: el estudio concluye que, si bien el desarrollo de escuelas verdes contribuye positivamente a la educación sostenible, también enfrenta desafíos de resistencia arraigados en patrones culturales y de comportamiento. Para garantizar su eficacia, el proceso de desarrollo requiere la mediación a través de programas integrales de escuelas verdes que involucren a todos los miembros de la escuela, en particular al profesorado y al alumnado.

Palabras clave: Desarrollo Escolar; Resistencia; Escuela Verde.

INTRODUCTION

Environmental issues such as waste, flooding, and air pollution are serious problems in Indonesia and around the world. Indonesia produces 21,1 million tons of waste per year, with 34,29 % (7,2 million tons) unmanaged, causing pollution and increasing the risk of flooding in major cities such as Jakarta.⁽¹⁾ Globally, well over 2 billion tons of waste are generated each year, with only 16 % being recycled, while the rest causes soil, water, and air pollution. Jakarta also has poor air quality, exceeding WHO standards.⁽²⁾ To address this issue, the international community has developed green growth policies. Sustainable development goals (SDGs) encourage countries to implement strategies focused on green growth.^(3,4) Green growth aims to achieve sustainable development through environmental protection and improved quality of life.^(5,6)

In Indonesia, the green growth policy has been integrated into the National Medium-Term Development Plan (RPJMN) 2020-2024, targeting a 27,3 % reduction in carbon emissions by 2024 through renewable energy, energy efficiency, waste management, and natural resource protection.⁽⁷⁾ Through the Green School initiative,⁽⁷⁾ schools strategically support this objective because green infrastructure may encourage environmental solutions⁽⁸⁾ and limit exposure to pollutants.⁽⁹⁾ Schools can become hubs of change with the help of the government, non-governmental organizations, and corporate soci47

al responsibility programs.

According to,^(8,9,10,11,12,13,14) strategic planning is necessary for school development to meet policy requirements and technological advancements. By striking a balance between economic growth and environmental conservation, schools, as educational institutions, influence attitudes, behaviors, and culture.⁽¹⁰⁾ This promotes green growth.^(11,12,13) Strategic planning has a major impact on organizational performance, according to previous studies.^(14,15,16) However, there is opposition to creating green schools because organizational change frequently upsets identities, routines, and norms, which can cause stress when knowledge and skills are lacking.^(17,18,19,20,21,22,23)

Principals have difficulties in establishing green schools because of teacher resistance, which is frequently brought on by a lack of knowledge, a fear of change, or an unwillingness to carry out sustainability initiatives. Low teacher involvement, a lack of technical assistance, poor communication, and a lack of sustainability knowledge are all associated with this resistance.^(24,25) According to research, the development and accomplishment of green school policy objectives depend on community involvement and organizational roles, including those inside schools.^(26,27) To accelerate transformation, principals and teachers must actively participate as change agents.⁽²⁷⁾ Research is therefore required to determine methods for getting over opposition when putting green growth ideas into practice in schools.

METHOD

This study used a quantitative correlational design to analyze the effect of school development (independent variable) on resistance (dependent variable), with the green school program and learning as mediators. School development and change were mediated by Lewin's theory (Unfreeze, Change, Refreeze). This study was conducted in collaboration with the West Sumatra Provincial Education Office, supported by a memorandum of understanding (MOU), permission, and participant consent, with data confidentiality guaranteed. Data were analyzed using SEM-PLS, which is suitable for testing complex relationships and large-scale data without strict multivariate assumptions.

The study population included all principals and teachers in Padang City, which comprises 11 sub-districts. The population totaled 1064. The sample was drawn using a random sampling technique, with the criteria being

the vocational high school planning and development team, which numbered 168 people. Further details are provided below:

No	Kecamatan	Population	Sample
1	Lubuk Kilangan	24	8
2	Lubuk Begalung	218	30
3	Padang Selatan	23	8
4	Padang Timur	182	27
5	Padang Barat	198	27
6	Padang Utara	97	9
7	Nanggalo	30	8
8	Kuranji	217	33
9	Pauh	70	9
10	Koto Tengah	82	9
Total		1,064	168

Data Collection and Analysis

Data was collected using a closed-ended Likert scale questionnaire. The instrument was first validated through expert judgment to assess substance, relevance, and clarity, followed by revisions based on feedback. Empirical testing was then conducted to confirm statistical validity and reliability. Construct validity was measured using Average Variance Extracted (AVE), while reliability was tested with Cronbach's Alpha to ensure internal consistency.

Research Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Green School Program	0,882	0,888	0,913	0,679
changing	0,919	0,925	0,934	0,641
Green School Learning	0,880	0,885	0,910	0,629
freezing	0,833	0,835	0,883	0,603
resistensi	0,957	0,962	0,961	0,638
unfreezing	0,892	0,902	0,918	0,650

All variables met validity and reliability criteria. The Average Variance Extracted (AVE) values ranged from 0,603 to 0,679, all above 0,5, confirming indicator validity. Composite Reliability (rho_a) values for all variables were above 0,7 (ranging from 0,835 to 0,962), indicating strong reliability. Data were collected through in-person and online questionnaires, with clear explanations of objectives, procedures, and confidentiality to ensure honest responses. Researchers also checked completeness and consistency of answers, ensuring data integrity, accuracy, and compliance with research standards.

RESULTS

School Development in Implementing a Green School with the Lewin Model

Based on the data analysis results, the total score across the three stages of change according to Lewin's theory (unfreezing, changing, and refreezing) shows an average value of 77,658 with a median value of 76, a minimum score of 27, and a maximum score of 95, as well as a standard deviation of 15. This finding indicates that, in general, the level of change implementation through the green school approach is quite high, although there is considerable variation among respondents. This statistic indicates that most respondents already understand and participate in the change process, but a small portion still have relatively high resistance, requiring special attention during program implementation. Table 3 shows the research results from developing a green school using Lewin's model, which consists of the unfreeze, change, and refreeze stages:

Table 3. School Development in Implementing a Green School Using the Lewin Model

Sub Indikator	Mean	Median	Minimum	Maximum	Standard deviation
Unfreezing	24,750	24	7	30	4,929
Changing	32,391	32	11	40	6,082
Refreezing	20,517	20	9	25	3,558
Total	77,658	76	27	95	15

Resistance

The research results on resistance to change and the development of a green school can be seen in the table below:

Table 4. Resistance

Sub-Indicator	Mean	Median	Scale min	Scale max	Standard deviation
Habits	14,587	14	7	34	2,104
Competitiveness	15,859	14	7	35	4,167
Total	30,446	28	14	69	6,271

Based on the table above, the total average score is 30,446 with a median of 28, which is at a moderate level compared to the maximum scale (69). This means that resistance is generally present but not considered high.

The Influence of School Development in the Implementation of Green Schools to Face Resistance Challenges in Schools

This research analyzes how school change and development face the challenges of teacher resistance in implementing green school policies. The following is a model of school change and development in facing the challenges of teacher resistance in implementing green school policies:

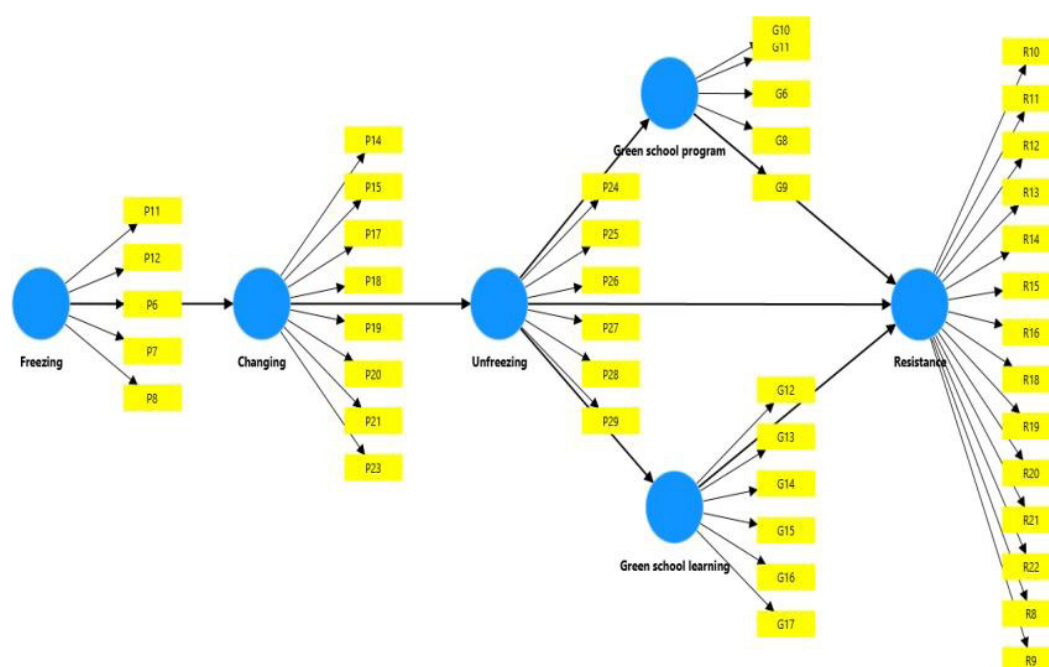


Figure 1. SEMPLS Model of the Effect of School Development Using Lewin's Theory through Green School in Facing Resistance

The model in the figure 1 illustrates the flow of influence between variables based on Lewin's organizational change theory framework (unfreezing-changing-freezing), linked to the context of green schools and resistance. The process begins with the freezing stage, which contributes to changing. This changing process then drives

the unfreezing stage. Subsequently, the unfreezing stage influences the green school program and green school learning. These two factors then influence the resistance variable. The data can be further explained as follows:

The Influence of School Change and Development on Resistance

The analysis results show that applying the stages of change according to Lewin's theory (unfreezing, changing, refreezing) significantly influences the development of the school into a green school. The stages of change positively contribute to the implementation of the green school program ($B = 0,294$; $p = 0,000$) and green school learning ($B = 0,254$; $p = 0,000$) and overall drive school change and development ($B = 0,441$; $p = 0,000$). However, the stages of change do not directly influence the reduction of resistance ($B = -0,020$; $p = 0,656$). This means that simply going through the stages of change is not enough to reduce resistance without translating it into real programs and learning.

The Influence of the Green School Program and Learning Changes and Development on Resistance

Green school learning has a significant but small impact on resistance ($B = 0,073$; $p = 0,035$) and even tends to increase initial resistance because teachers and students feel burdened by new demands. Conversely, the green school program is effective in reducing resistance ($B = -0,139$; $p = 0,000$). Implementing tangible programs like waste management, greening, and energy conservation has proven more effective in reducing resistance compared to changes at the learning level. For more details, please refer to the table below:

Table 5. Results of Significance Test of Relationships between Research Variables

Variables path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Freezing -> Changing -> Unfreezing	0,441	0,451	0,052	8,492	0,000
Freezing -> Changing -> Unfreezing -> Green school learning -> Resistance	0,073	0,076	0,035	2,104	0,035
Freezing -> Changing -> Unfreezing -> Green school program -> Resistance	-0,139	-0,148	0,038	3,658	0,000
Freezing -> Changing -> Unfreezing -> Green school program	0,294	0,305	0,044	6,717	0,000
Freezing -> Changing -> Unfreezing -> Green school learning	0,254	0,266	0,046	5,549	0,000
Freezing -> Changing -> Unfreezing -> Resistance	-0,020	-0,022	0,045	0,446	0,656

DISCUSSION

The purpose of this study was to examine how school development and change address challenges in achieving green school implementation. The results indicated that green school development using Lewin's theory of change (unfreezing, changing, and refreezing) proved effective ($M=77,658$). There was a significant relationship between school development based on Lewin's model and green school implementation (programs and learning) on resistance ($p<0,005$). However, these changes and developments also gave rise to resistance, largely due to ingrained old habits and concerns about competitiveness. Other results indicated that green school development can directly trigger resistance. For more details, see below.

The Influence of School Development on Resistance

Developing a green school is important to contribute to environmental impact. With this development, resources can be saved and waste minimized for the environment.^(28,29) By implementing green school development, students can be prepared to face the challenges of sustainable environments.⁽³⁰⁾ To implement changes and development in green schools, Lewin's theory can be used. Organizational change and development using Lewin's theory have followed a logical flow, where freezing old patterns/practices drives change in implementing green schools. This aligns with what⁽³¹⁾ stated: Lewin's theory provides a framework to assist in managing change. Lewin's theory is in line with contemporary models that integrate behavior and organizational change literature, emphasizing the psychological aspects of driving behavioral change. Such an approach can improve organizational change management.⁽³²⁾

School development is important for implementing a green school and contributing to achieving green growth. This plan integrates sustainable development and environmental factors to ensure high-quality education and promote green school initiatives.⁽³³⁾ Additionally, by instilling ecological awareness from an early age, green schools help achieve green growth. Green schools not only produce academically intelligent students but also teach them to be socially aware and responsible toward the environment. Therefore, schools play a crucial role

in creating a generation ready to face global environmental challenges. In situations like this, green schools function as living laboratories, helping students balance their cognitive, affective, and psychomotor skills. In this way, lifelong learning can become a reality.

Resistance arises due to changes in the development of an organization. The research findings indicate the presence of resistance in the development plan for green schools. Furthermore, the research reveals that while changes and developments in green school implementation using Lewin's theory have occurred, they have not directly reduced the level of resistance. Experts believe that discomfort or fear in adopting new practices typically causes such rejection.⁽³⁴⁾ Teachers may resist changes that threaten their principles, especially if the policies are detrimental to students.⁽³⁵⁾ Additionally, misaligned priorities and goals pose challenges when implementing new policies.⁽³⁶⁾ Other studies have found that employees often resist change due to fear of the new or because long-standing organizational practices make change complex and difficult.^(36,37)

Resistance has a negative impact on employees' commitment to the organization and their perception of organizational effectiveness.^(38,39) Furthermore, resistance also negatively affects trust in the organization⁽³⁹⁾ and can also decrease psychological well-being.⁽⁴⁰⁾ Organizations need to adapt to change and development to remain relevant.⁽⁴¹⁾ Organizations are required to be fast and resilient to make changes.⁽⁴²⁾ Similarly, the green growth policy requires schools, as educational institutions, to be involved in achieving it.^(43,44) In the school environment, this policy can be realized through the development of green schools that focus on efficient resource management, waste reduction, and fostering an environmentally conscious culture among school members.^(44,45,46)

Resistensi muncul karena adanya perubahan dalam pengembangan suatu organisasi. Dari hasil penelitian diketahui bahwa adanya resistensi dalam rencana pengembangan green school. Kemudian berdasarkan hasil penelitian diketahui bahwa adanya perubahan dan pengembangan green school menggunakan teori lewi walaupun telah melakukan mengembangkan pola pikir baru pada warga sekolah tidak secara langsung menurunkan tingkat resistensi yang muncul.

The Effect of Green School Changes and Development Through Green School Programs and Learning on Resistance

Changes and development of green schools are carried out through two activities: the green school program and green school learning. The research results show a positive and significant influence of green school learning on resistance. This means that the stronger the environmental learning practices implemented in schools, the higher the resistance among school members.

Regarding the green school program, the results show a negative and significant influence of the green school program on resistance. This means that the stronger the implementation of the green school program, the lower the level of resistance among school members. From these results, it can be concluded that what the school needs to do to develop and make changes to implement a green school and reduce resistance is to implement a green school program. This aligns with the researchers⁽³⁵⁾ that programs created with teacher involvement will reduce resistance to change. Furthermore, programs created by giving teachers time to observe and be observed, and which are based on trust and respect, can rejuvenate experienced teachers and encourage them to accept change.⁽⁴⁷⁾ So, with the green school program in school development to implement green growth, it will be able to reduce resistance from the school community. By implementing a green school program, it can support the concept of green growth. This program helps people learn about sustainable resource management, energy efficiency, and the environment. Active student involvement in school reduces resistance to change because they directly benefit from the changes.

CONCLUSIONS

School development can contribute to achieving green growth policies through the implementation of green school policies. However, the changes and development of schools toward becoming green schools often encounter resistance. The research findings indicate that this resistance arises due to the discomfort of some parties, including teachers, who are accustomed to old practices, as well as concerns about the ability to adapt and compete. This change process can be explained through Lewin's theory (unfreezing, changing, refreezing), which emphasizes that each stage is interconnected and influences the implementation of green growth through green schools. Therefore, the development of green schools should be done in stages through green school programs and environmental-based learning. These changes do have the potential to cause resistance, especially from teachers who are already comfortable with conventional teaching practices. To address such challenges based on research findings, a green school program is needed that actively involves teachers and students. Through this involvement, school development in support of green growth policies can reduce any resistance that arises. Therefore, the principal needs to develop a clear, measurable, and engaging green school program that fosters a sustainable culture and effectively utilizes school resources for creating a green environment and implementing good waste management practices within the school.

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Authors declare that there is no conflict of interest.

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