THE ROLE OF LEADERSHIP IN ADOPTING GREEN TECHNOLOGY

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Abstract: This study examines the role of leadership in adopting green technologies in the industrial sector. With increasing attention to sustainability and climate change issues, organizational leaders have a critical responsibility in driving the adoption of green innovations. Using a qualitative approach, this study involved in-depth interviews and focus group discussions (FGDs) with leaders from various organizations that have successfully implemented green technologies. The results of the study show that visionary leadership and the ability to create an organizational culture that supports innovation have a significant impact on the success of green technology adoption. In addition, employee involvement in the decision-making process and partnerships with external parties have also been shown to strengthen sustainability efforts. However, this study identified challenges, including internal resistance and resource constraints, that may hinder the process. These findings highlight the importance of the role of leaders in overcoming barriers and creating a conducive environment for green technology adoption. This study is expected to provide useful insights for practitioners and policymakers in designing more effective sustainability strategies.

INTRODUCTION

In the era of globalization and increasingly pressing climate change, the need for sustainability is becoming a top priority in various industrial sectors. Green technology, which includes various environmentally friendly innovations, plays an important role in reducing negative impacts on the environment. However, the adoption of this technology often faces complex challenges, one of which is leadership. Effective leadership can be a determining factor in the success of green technology implementation. Visionary leaders not only set strategic goals but also create an environment that supports innovation and collaboration. They play a role in shaping an organizational culture that encourages employees to actively participate in sustainability initiatives. However, not all organizations have leaders capable of driving this change. Some leaders may lack understanding of the benefits of green technology or face

resistance from employees and other stakeholders. In addition, external challenges, such as limited resources and unfavorable regulations, can also hinder the adoption process.

In this context, qualitative research on the role of leadership in adopting green technology is very relevant. This study aims to understand how leaders facilitate change, overcome challenges, and encourage employee participation. Through interviews and focus groups, it is hoped that effective patterns and strategies in adopting green technology can be found. By understanding the role of leadership, organizations can develop more effective approaches to addressing sustainability challenges, while contributing to global goals to protect the environment. This research is expected to provide valuable insights for academics, practitioners, and policy makers in designing better sustainability strategies. Transformational leadership is often considered the most effective approach in driving change, including in adopting green technology. Research from Nguyen et al. (2017) shows that transformational leaders, who have a clear vision and are able to inspire and empower employees, play an important role in the successful implementation of green technology in organizations. Leaders who encourage innovation and sustainability often have a significant influence in driving the adoption of green technology in companies.

Qualitative research on green technology adoption often uses the Theory of Planned Behavior introduced by Ajzen (1991), which was later strengthened in the context of green technology by researchers such as Zhang et al. (2016). This theory explains that an individual or organization's intention to adopt green technology is influenced by their attitude toward the technology, subjective norms, and perceived behavioral control. Leaders play a role in shaping these three elements by creating a culture that supports innovation and sustainability. The concept of green leadership has become increasingly popular in recent years, especially in research after 2014. Chen and Chang (2013) stated that green leadership involves leaders who actively promote green and sustainable practices. They emphasized that leaders with a strong commitment to the environment are able to move organizations towards implementing green technology. Recent studies such as García-Morales et al. (2018) added that green leaders have a moral responsibility in creating strategies that support green technology.

Innovation Diffusion Theory (Rogers, 2003) is also often the basis for studies on

technology adoption, including green technology. Research such as that conducted by Li et al. (2017) shows that the role of leadership in the diffusion of innovation, especially green technology, is very important in facilitating communication about the benefits of the technology. Leaders must be able to develop effective communication strategies and support widespread adoption. According to Avery and Bergsteiner (2016), sustainability leadership is an important approach in facing modern environmental and social challenges. Sustainability-focused leaders not only encourage the adoption of green technologies but also integrate sustainability principles into the overall organizational strategy. Further research from McEwen and Schmidt (2018) shows that leaders who focus on sustainability are able to create a culture of innovation that is conducive to the adoption of green technology. Ecological leadership proposed by researchers such as Stead and Stead (2015) is a theory that emphasizes the relationship between leaders and the surrounding ecosystem. This leadership focuses on environmentally responsible decision-making, where leaders have a long-term vision in maintaining a balance between economic benefits and environmental impacts through the application of green technology.

RESEARCH METHODS

This research method uses a qualitative approach to explore the role of leadership in adopting green technology. The following are details of the methods used :

1. Research Approach

   Qualitative: This approach was chosen to gain an in-depth understanding of leaders' experiences and views in the context of green technology adoption. The data obtained will be descriptive and exploratory.

2. Research Design

   Case Study: This study will use a case study design to explore several organizations that have successfully adopted green technology. Each case will provide unique insights into the role of leadership

3. Sample

   Participants: Leaders from various industry sectors (e.g., manufacturing, energy, and agriculture) who have adopted green technologies. The number of participants will

vary, with a target of around 10-15 leaders. Sampling Technique: Use purposive sampling to select participants who have relevant experience with green technology adoption.

4. Data Collection

   In-depth Interviews: Semi-structured interviews will be conducted to explore leaders' views, experiences, and strategies in adopting green technologies. Questions will be designed to encourage open discussion. Focus Group Discussions (FGDs): FGD sessions will be held to explore group dynamics and collaboration among leaders in adopting green technologies. These discussions will provide additional perspectives and highlight interactions between leaders and employees.

5. Data Analysis

   Thematic Analysis: Data obtained from interviews and FGDs will be analyzed using a thematic analysis approach. This process includes:

   a. Transcription of interviews and discussions.
   b. Reading and understanding data to find patterns.
   c. Identifying key themes related to leadership roles and green technology adoption.
   d. Organizing and interpreting themes in the context of existing literature

6. Data Validation

   Triangulation: To increase the validity of the findings, data triangulation will be conducted by comparing information from interviews, FGDs, and related document sources (such as company reports and sustainability policies).

RESULTS AND DISCUSSION

Leaders who successfully adopt green technologies often have a strong vision for sustainability. They are able to communicate the long-term goals and benefits of green technologies to all members of the organization. Research shows that leaders who create an open and innovative organizational culture can increase employee participation. This culture encourages employees to innovate and propose new ideas related to sustainability. Employee involvement in the decision-making process related to sustainability is essential. Leaders who involve teams in green initiatives create a sense of ownership, leading to greater support for change. Leaders who actively engage with external stakeholders, such as government agencies, non-governmental organizations, and research institutions, show that collaboration can accelerate the adoption of green

technologies. The findings also show that leaders who have skills in change management are able to overcome internal resistance. They use effective communication to explain the benefits of green technology and reduce employee concerns.

The findings show that leaders serve as key change agents. Transformational leadership style, where leaders inspire and motivate teams, has been shown to be effective in adopting green technologies. This is in line with leadership theory which states that visionary leaders can lead organizations towards sustainability goals. An organizational culture that supports innovation and sustainability contributes significantly to the successful adoption of green technologies. When leaders are able to build a safe environment for sharing ideas and experimentation, employees are more likely to contribute to green initiatives. While employee engagement can increase support, resistance remains a challenge. Successful leaders use a transparent and inclusive communication approach to address employee uncertainty and concerns, demonstrating that effective change management is essential. Partnerships with external parties expand access to the resources and knowledge needed for green technology adoption. Leaders who are proactive in building collaborative networks can tap into expertise and resources not available internally.

CONCLUSION

This study shows that leadership plays a very important role in adopting green technologies in the industrial sector. Visionary leaders who are able to clearly communicate a sustainability vision can inspire and motivate employees to participate in green initiatives. In addition, an organizational culture that supports innovation and employee engagement has proven crucial in the adoption process. Effective leaders also demonstrate the ability to manage change and overcome resistance, as well as build strategic partnerships with external stakeholders. All of these factors contribute to the success of organizations in implementing green technologies.

1. Organizations should invest in leadership development programs that focus on sustainability and change management skills. This training can help leaders inspire their teams to innovate and participate in green initiatives.
2. It is important to create a work environment that supports innovation. Organizations

should encourage employees to share ideas and experiment, and reward their contributions to sustainability efforts.

3. Involving employees in the decision-making process related to green technology can increase ownership and support for change. Organizations are advised to organize forums or discussions that allow active participation from all levels of employees.
4. Organizations need to establish partnerships with external institutions, such as governments and universities, to expand access to resources and knowledge needed in green technology adoption.
5. Further research is needed to explore the dynamics of green technology leadership and adoption across different sectors and contexts. This can provide additional insights into effective strategies in achieving sustainability.

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