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Review

School Principals' Support for the Implementation of Sustainable Education: A Case of Climate Change Education

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Abstract: This paper examines the kinds of school leadership support that promote sustainable education in primary and secondary schools. The paper focuses on climate change, another critical aspect of education for sustainable development. The impact of climate change on the environment has become increasingly alarming, and governments worldwide have sought long-term solutions. World leaders, including other critical stakeholders that focus on environmental sustainability, have conducted discussions and conferences on several platforms to debate the negative impact of climate change and how to address the problems. Despite all these, teachers are not adequately supported by school leadership to teach climate change in their teaching. Twenty-eight articles were selected through predetermined inclusion and exclusion criteria and the PRISMA flow model. Therefore, the qualitative literature review approach was utilized to establish how school leaders support implementing climate change education in their schools. This approach entails thoroughly reading articles selected for the paper, analyzing and sorting them to identify relevant materials. However, the literature suggests that school leaders must make adequate efforts to support the implementation of climate change in schools. The literature revealed that for schools to implement sustainable education, they must be led by sustainable leaders who encourage a culture of participation and collaboration. This paper, therefore, recommends that education departments capacitate their school leaders along the lines of sustainable leadership theory.

Keywords: School leaders, Climate change education, Education for sustainable development, Sustainable school, Environmental education

1. Introduction

This paper explores school principals' roles in promoting education for sustainable development (ESD) in the classroom. Providing effective leadership support for teachers teaching climate change education (CCE) in Secondary schools is a core responsibility of school principals. This role is vital because of the negative impact of climate change (CC) and the need to address the menace. Efforts to address the problem of climate change have been intensified by notable stakeholders, including governments and non-government organizations, by advocate for the integration of climate change education into the school curriculum. and the international organizations' and other notable stakeholders' determination to address the issue by integrating climate change education (CCE) into the curriculum (Olawumi et al., 2023). This paper focused on school principals' roles in promoting ESD in the classroom. Providing effective leadership support for teaching sustainable education (SE) in their schools is one of the responsibilities of school principals. Conferences and meetings have been held globally to discuss ways to adapt to and mitigate the environmental impact of CC. It has been observed that the implementation of CC policies depends heavily on stakeholders, including educators, curriculum planners, environmentalists, heads of government from around the world, and other professionals (Apollo & Mbah, 2021; Mavuso et al., 2022a; Olawumi et al., 2023). According to the United Nations, education is one of the ways to educate students about CC, the need to protect our environment from threats, how to address the problem of CC, and adaptation and mitigation strategies that can be adopted to address the problem (Vigneswaran et al., 2017). This suggests that school administrators are crucial in implementing CCE; however, studies by Mogren and Gericke (2017), Mogren and Gericke (2019), and Raath and Hay (2016) indicate that school administrators are not doing enough to encourage integration of CCE in classrooms by teachers (Khalo et al., 2023). The importance and role of school management in implementing sustainability and ESD, which includes environmental sustainability in schools, have not received much attention from researchers. However, studies on the effectiveness of schools have revealed that principals also play an important role in this. While most ESD research focuses on teaching and learning, only a small number of studies have examined the implementation of environmental sustainability and its relationship to school organization (Howard et al., 2019; Kioupi & Voulvoulis, 2019; Müller et al., 2021; Mavuso et al., 2022b). However, in South Africa, there seems

to be little effort focusing on supporting the implementation of CCE at the school level. Despite the importance of CCE in addressing the CC-challenges in South Africa, school principals are not adequately supporting teachers in the implementation of CCE in their classrooms. Teachers need support from their principals around pedagogy and the teacher capacitation program for the effective implementation of CCE.

Therefore, this paper examines how school administrators assist in implementing CCE in schools and make a case for the significance of their involvement in its execution.

2. Problem Statement

The school principal's role in supporting teaching and learning of climate change has been emphasized (Mege, 2024; Khalo et al., 2023). Findings from the literature reveal that most principals are abandoning these crucial roles because they lack awareness of the devastating effects of climate change on the environment (Mthanti & Msiza, 2023). Some of the reasons why principals are lacking in these critical roles may be attributed to their unwillingness to provide a supportive role in teaching climate change in their schools. In this study, school principals, also known as school leaders, are essential to the operation and sustainability of schools. Another crucial component of ESD is CC, which is the focus of this paper. Over time, CC effects on the environment have grown increasingly concerning, and governments everywhere have worked to find sustainable solutions (Celik, 2020). Conferences have been held to discuss the adaptation and mitigation strategies that can be adopted to address the impact of CC globally. Stakeholders around the world, including world leaders, heads of state, educators, environmentalists, and other professionals, have been identified as crucial to implementing CC policies (Apollo & Mbah, 2021; Mavuso et al., 2022a; Khalo et al., 2023). The UN has identified education as one of the ways to educate students about CC, the need to protect the environment from threats, and how to address the problem worldwide (Divya et al., 2017). This suggests that implementing CC requires the involvement of school leaders. However, research by Mogren and Gericke (2017), Mogren and Gericke (2019), and Raath and Hay (2016) indicates that school administrators are not doing enough to assist with the implementation of CCE in schools (Khalo et al., 2023).

The crucial role of school management in implementing sustainability and ESD, which includes environmental sustainability in schools, has not received much empirical attention. However, studies on the effectiveness of schools have revealed that principals also play a significant role in this (Khalo et al. 2023). While most ESD research focuses on teaching and learning, only a small number of studies have examined the implementation of environmental sustainability and its relationship to school organization (Howard et al., 2019; Kioupi & Voulvoulis, 2019; Müller et al., 2021). Therefore, this paper critically examines how school leaders encourage the use of CCE in classrooms and make the case for the significance of their involvement in its execution.3. Results

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation as well as the experimental conclusions that can be drawn.

3. Theoretical Framework

This paper is based on sustainable leadership theory, but because it shares many characteristics with sustainability leadership theory, we also adopt the transformative leadership theory. According to McCann & Holt (2010), sustainable leadership theory represents a growing sense of purpose among individuals who decide to live their lives and lead organizations in ways that take into consideration their effects on the environment, society, and the state of the global economy. Because of this, sustainability theory is pertinent to this work. As per this theory, an organization ought to optimize its present and future profits while simultaneously improving the quality of life for all stakeholders (McCann & Holt, 2010). Schools and other organizations may use sustainability philosophy as an example to motivate their employees. A stock option program based on productivity goals and a decrease in quality defects, for instance, is developed by sustainable factory or business leaders. Because they will strive to increase their value, employees benefit from ownership. The organization gains from improved quality, higher output, and enthusiastic employees. Shared prosperity benefits all parties involved with the organization (McCann & Holt, 2010). The importance of leadership development for sustainability is emphasized by Chikoko (2019). Strategic leadership, leadership for learning, and ethical leadership are the three elements he identifies as constituting sustainable leadership. This process includes establishing a common understanding among the stakeholders and determining the organization's future course. The theory of sustainable leadership also calls for developing strategic competencies, encouraging lifelong learning among organizational members, and changing members' attitudes and behaviors to align with the plan. Sustainability theory is crucial to understanding how school administrators can support the implementation of CCE in a way that enhances teachers' abilities, encourages cooperation among stakeholders, and improves the socio-economic circumstances of communities (McCann & Holt, 2010). According to Cook (2014), sustainable leadership promotes and safeguards lifelong learning, guarantees long-term success, assists others in leadership roles, tackles social justice concerns, builds rather than depletes human and material resources, cultivates environmental diversity and capacity, and participates in activist environmental activism.

Like sustainability leadership theory, transformational leadership theory addresses inequalities within the organization, the community, and the global community to bring about change. They are explicit about the processes required to achieve the revolutionary goals of equity, democracy, emancipation, and perfection. According to Shields (2011), the transformational leadership tenets reinforce the value of education as a vital instrument for enacting social change and preparing students for global competition.

4. Material and Methods

How school administrators assist in implementing CCE in their schools was examined using a qualitative literature review methodology. This research approach will serve as a guide for analyzing the literature chosen for the study (Creswell & Creswell, 2017). According to Mkosi et al. (2023), this method comprises carefully reading the chosen articles for the study, evaluating them, and classifying them to find pertinent information. This method included selecting articles on secondary school principals' opinions regarding the use of climate change education from EBSCO, Google Scholar, Web of Science, Scopus, ERIC, and Mendeley. For this paper, twenty-eight (28) articles from various international journals were chosen. Due to the researchers' time constraints and to guarantee that only articles published in respectable journals are reviewed, a small number of twenty-eight articles were chosen for the study. The selection criteria for this review paper were that the articles must address the research questions, be peer-reviewed, be published between 2010 and 2023, and speak to the paper's title. According to the literature and the research questions chosen for this paper, the articles selected for this study were examined under different themes and sub-themes. Because researchers have conducted similar reviews, but they cover periods before 2010 (Conway 2015), the researchers selected articles published from 2010 to 2023.

5. Inclusion and Exclusion Criteria

The authors consider the inclusion of articles published between 2010 and 2023. Only peer-reviewed articles were considered for review, which indicates that book chapters, conference proceedings, books, and other materials that are not peer-reviewed are not considered for the study, as the authors focused exclusively on peer-reviewed articles. The articles selected align with the title of the paper and focus on climate change education, sustainable development, and principal support for teaching climate change education. These are the search strings used in arriving at the reviewed papers.

6. Search Results

We employ the PRISMA Model to describe the selection of articles for review. Articles were manually selected from the EBSCO, Google Scholar, Web of Science, Scopus, ERIC, and Mendeley databases. Keywords like school principals' support, climate change education (CCE), and implementation of sustainable education were used to select relevant literature from databases for the study. The initial search revealed 184 articles, after screening using the inclusion and exclusion criteria, like year of publication, peer review, relevance of the articles to the topic, and removing repeated articles resulted into the selection of 28 articles were selected for the study. However, articles that are not peer-reviewed and published in a language other than English were excluded from the study. The data selection process is illustrated in Figure 1, the PRISMA Model below. On the reliability and validity of the data selection process, we sought expert review throughout the entire data collection process.

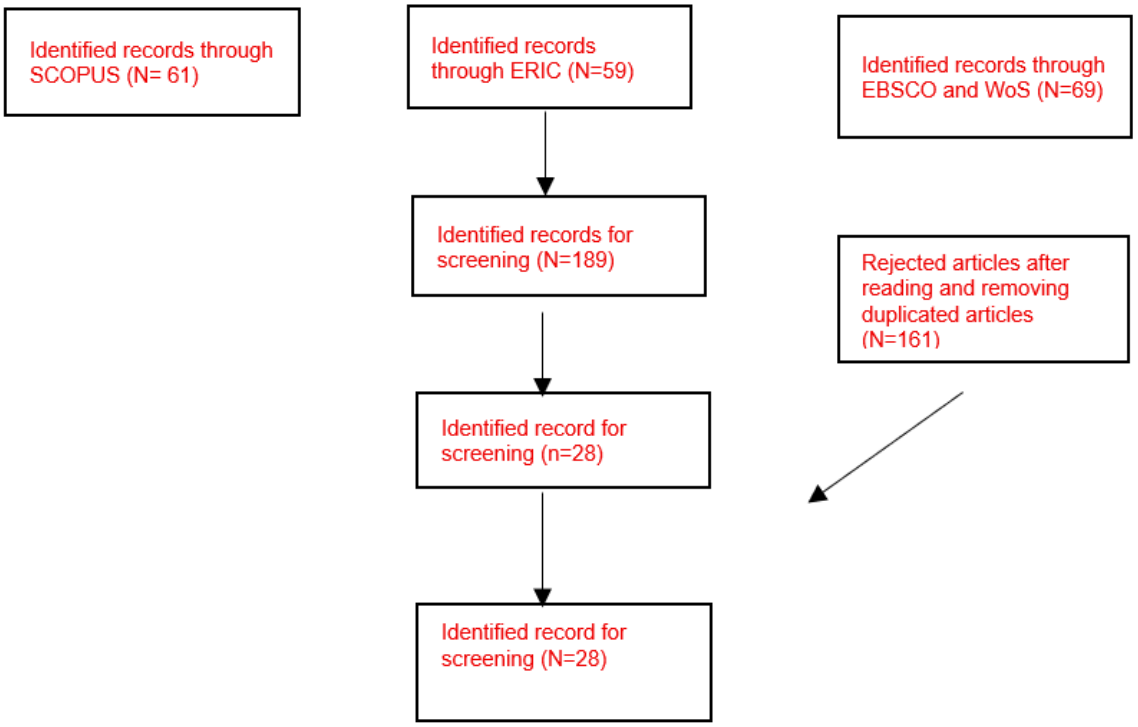

Fig. 1. PRISMA Model Chart.

7. Findings from Literature

7.1. Climate Change Education

In recent years, authors and scholars have attempted to define CCE, including Mochizuki & Bryan (2015), Monroe et al. (2019), Rousell and Cutter-Mackenzie-Knowles (2020), and Stevenson et al. (2017). Burning fossil fuels and environmental degradation are some of the major problems associated with climate change. The Intergovernmental Panel on Climate Change (IPCC) observed that climate change is a long-term, observable, and measurable phenomenon that requires global attention (Mavuso et al., 2022b; Khalo et al., 2023. Addressing climate change will require increasing the awareness level of students and other stakeholders of the need to adapt to the problem and the mitigation strategies to mitigate the issues. These strategies align with the position of the United Nations, which adopts education as one of the key strategies to address climate change (March and Feinstein, 2020). As a result, climate change education has developed into one of the most effective means of disseminating knowledge about the necessity of mitigating and adapting to environmental issues. (Feinstein & MaShield rch, 2020). Students must be taught the importance of changing their attitudes to protect the environment and adjusting to environmental challenges. According to Mochizuki & Bryan (2015), Monroe et al. (2019), and Stevenson et al. (2017), teaching secondary school students about CC can encourage moral behavior and a positive attitude towards the environment. CCE may have an impact on students' attitudes and beliefs, which in turn can positively change the way they behave in their surroundings. Tang (2023) supports this claim and argues that integrating CCE into the school curriculum can change the attitude and perception of learners positively towards their environment. Learners' beliefs about climate change can influence their attitude towards their environment. Since CC is an issue that will persist for a very long time, we must figure out how to adapt and lessen its effects through our social and economic ties (Mochizuki & Bryan, 2015). Teachers should receive support in the school to improve their ability to integrate CCE into their lessons to accomplish this admirable goal. Promoting the inclusion of CCE in schools should be the primary responsibility of principals (Khalo et al., 2023). Support from school principals would help teachers become more capable of raising students' awareness and improving their academic performance (Day et al., 2016; Khalo et al., 2023). Teachers' attitudes toward the environment will change with leadership support for climate change education. School leadership from the SGB, School management role in supporting teachers are key to enhancing learners' performance. This position aligns with the findings of

Olawumi et al. (2023) in a study titled “Implementation of teacher development programme for integrating climate change education: Natural teachers’ view”. The study argues that teachers' professional development programme on CCE can enhance their pedagogical strategies and learners' performance.

Knowledge of CC, which is linked to the educational system and sociopolitical forces, influences students' beliefs, conceptions, and perceptions toward CCE among their peers, according to a longitudinal study on the successful implementation of CCE in Chinese tertiary education (Tang, 2023). Addressing the problem of CC requires an understanding of CCE and the associated harm to the environment. According to Olawumi et al. (2023), students in the lower grades of the educational system should be taught CCE to raise awareness in the formative stage to help them become effective change agents in their communities. Resources for teaching and learning CCE must be made available, and school leadership must support teacher capacity building on CCE for sustainable development to be implemented in the classroom effectively. This will be very helpful in addressing the issue of CC that our environment is currently facing.

7.2. The Importance of the Role of School Leaders for Sustainable Education

Research findings have indicated that principals play a critical role in the implementation of CCE in secondary schools. This claim alludes to the belief held by Goolamally and Ahmad (2014) that principals must have a certain level of leadership competency, such as transactional, transformational, or educational leadership, before being appointed. School leadership plays a critical role when implementing CCE in their schools. The principal needs to be at the forefront of this exercise if we are to address the issue of CC in our community. Goolamally and Ahmad (2014) reveal further that principals now play a critical role in schools due to the intricate challenges of implementing SE. Principals are expected to play the following roles: (a) supporting teachers in developing a deep understanding of pedagogy and content (climate change education concepts), skills, and disposition in a sustainable manner; (b) advocating for practices and measures that will facilitate school orientation on SE; and (c) offering support that will position the school as a social agent to foster community partnership to arrive at the school's overall goals and vision sustainably.

In a contemporary educational environment, teachers' support from the school administration determines students' academic success (Kadji-Beltran et al., 2013). Without strong leadership support for teachers' involvement in professional learning communities (PLCs), the call to increase teacher participation in PLCs cannot be fully implemented. For teachers to improve their capacity by exchanging knowledge about the most effective methods of incorporating CCE into their lessons, PLC formation sustainably requires leadership support (Kadji-Beltran et al., 2013). Establishing high-quality, sustainable educational leadership is necessary to guarantee that schools continue to prosper after the leader departs.

According to Mogren and Gericke (2019), sustainability is a system's capacity to continuously improve while overcoming difficulties while staying loyal to its fundamental principles. The overall objective of SE is to equip students with necessary skills that will assist them in addressing problems in their environment in a sustainably manner (Olawumi & Mavuso, 2024). To promote sustainable education, principals must make their institutions sustainable by encouraging a sense of shared responsibility, avoiding the waste of financial or human resources, and maintaining and preventing damage to the local educational and community environment (Cook, 2014). This suggests that to facilitate the exchange of creative ideas and successful practices among learning and development communities, principals must establish an organizationally diverse educational environment, work as activists with the forces that impact them, and cultivate a sustainable leadership culture. The importance of fostering a cooperative school culture among the members of the school community via common values, beliefs, and objectives is affirmed in this statement. This culture is the foundation for creating, promoting, and cultivating sustainable leadership (Cook, 2014). Like environmental education discourse, which has been replaced mainly in policy circles, ESD discourse emphasizes holistic, interdisciplinary, and learner-centered instruction that engages students in critical inquiries into real environmental and development-related issues (Cook, 2014).

On the other hand, traditional teaching approaches prioritize using teacher-directed, discipline-based, or transmissive pedagogy to teach curricula (Cook, 2014). In addition to environmental sustainability, ESD is focused on the shift to social and economic sustainability. Thus, ESD's objective and long-term vision for reviewing the current policies and practices challenge the dominant schooling goals, structures, curricula, and pedagogical practices that prioritize reproducing rather than altering society's socio-economic structures (Cook, 2014).

With its origins in ESD, sustainable education is still a relatively new concept and approach (Kadji-Beltran et al., 2013; Olawumi & Mavuso, 2024)). People, their objectives, policies, and practices are all supported in a sustainable school. It helps build relationships with local communities and incorporates sustainability concerns into the curriculum while incorporating adjustments to the school's day-to-day operations. According to Kadji-Beltran et al. (2013), it is driven by the idea of caring for oneself, others, and the environment. As per these ideas, establishing sustainable schools requires a thorough restructuring of the establishment at every level, encompassing pedagogical, organizational, technical, and social aspects.

Therefore, a school's operations, including curriculum, instruction, culture, resource management, and internal and external collaboration, must be reformed toward ESD (Cook, 2014). For example, this suggests that to engage students in meaningful, in-depth learning, curriculum and pedagogical approaches must integrate sustainability concepts and values like intergenerational fairness, respect, solidarity, and democracy. Sustainability ideas and practices must be incorporated into the school's culture, interactions with internal and external stakeholders, and resource usage, including paper, water, and electricity (Cook, 2014). A whole school or school-wide approach to ESD necessitates communal or shared leadership due to the diverse types of knowledge required for such a comprehensive approach to sustainability education (McCann & Holt, 2010). For instance, such a strategy calls for leadership that upholds and encourages democratic and participatory decision-making processes, including student involvement in running school administration sustainably. Collaborations with all parties involved, including parents of students, especially those aware of sustainability practices, curriculum integration, reducing the school's environmental impact, and sustainable grounds maintenance (McCann & Holt, 2010). A commitment to democratic governance, which calls for encouraging participation in decision-making, an outward, or beyond-the-school-gates, orientation to education that fosters both the school's interaction with the community and the community's engagement with the school, an optimistic outlook on life, and principles that demonstrate a commitment to social justice and environmental sustainability are just a few of the ways that sustainable school leaders differ from other teachers (Kadji-Beltran, et al., 2013). As previously stated, some evidence supports the idea that the unique challenges of ESD call for the development of qualities like optimism, perseverance, resilience, openness, and readiness to learn from others. Despite their awareness of the significance of SD, school principals have not been assertive to their responsibilities in assisting teachers to integrate ESD in their schools (Kadji-Beltran et al., 2013).

The SMT, SGB, and other levels of school system leadership should all work together to support principals in promoting SE in schools (Alkaher & Gan, 2020; Mogaji & Newton, 2020; Zachariou et al., 2013; Olawumi & Mavuso, 2024). According to Chiba et al. (2021), Edwards Jr. et al. (2020), and Jimenez et al. (2017), leadership support for sustainable education in schools can help teachers become more capable of teaching about cultural diversity, human rights, gender equality, sustainable lifestyles, and global civic education. The UN Agenda 2030 on Sustainable Development can be adapted to support SE now and in the future through the teacher capacity-building program that school administration is expected to provide.

The administration and leadership of the school are at the center of every school activity. The success or failure of a program is determined by how it fulfills its duties as instructional leaders. According to studies, an organization must first set its objectives and a clear action plan to achieve them if it hopes to improve performance. (Odumeru, 2013; McCleskey, 2014; Li et al., 2014). Promoting staff innovation and providing the tools needed to implement and maintain the innovations are two of the responsibilities of school administrators. Teachers are free to recommend modifications the school could implement to increase awareness of CC, and the leader usually agrees with their recommendations. To achieve the school's goals, sustainable and transformative school leadership leverages the expertise of educators, promotes logical and innovative thinking, and collaborates with them to resolve problems. (Zhang et al., 2021; McCann & Holt, 2010). However, including educators in the school's decision-making process results in more helpful recommendations, which help administrators better support adopting CCE.

According to Makame (2015), Warrilow (2012), and Willenbrock et al. (2015), school administrators who possess a transformational mindset positively model their beliefs and attitudes toward teachers. As team leaders, they lead by example and set an example. According to Makame (2015), they engage in practical activities that foster educational transformation. The leader's action may affect Stakeholders who doubt the transformation project. Because of the transformational leader's leadership attributes, this change in mindset can be connected to the teachers' transformation. The theories of transformational and sustainable leadership that are the foundation of this paper contend that these leaders facilitate team acceptance of shared goals and offer suitable role models. But according to Hansen et al. (2013), the main characteristic of a charismatic leader is their ability to set an example for their followers. They contend that this is so because a charismatic leader can easily exhibit moral behavior while motivating followers to prioritize group objectives over individual ones. Again, staff empowerment is crucial, as the principal helps them become better performers and thereby contributes to establishing a sustainable school (Warrilow, 2012). Capable teachers can use various teaching and learning techniques and assessments with their pupils. This illustrates how effectively the transformational leader can fulfill their responsibility of accurately coordinating the school's implementation of CCE.

8. Discussion

The literature on CCE revealed that the effects of environmental deterioration and the burning of fossil fuels, along with their associated consequences, have become a concern in recent years. This suggests that any intervention by school leaders should be transformative and sustainable in alignment with transformational and sustainable leadership theories to empower all stakeholders to take control of their surroundings. School administrators must thus make a concentrated effort to guarantee that CCE is applied in their institutions sustainably (Feinstein & March, 2020). The literature also suggested that instruction should be designed to help

students develop moral behavior and be able to adjust to changing environmental conditions. Additionally, the literature demonstrated that CC knowledge is essential and that students' understanding of CC plays a major role in the implementation of CCE in schools.

Research has shown that school principals need to have specific leadership skills. According to McCann & Holt (2010), they should be long-term leaders who ensure everyone involved has a shared vision. To ensure that schools are sustainable, Goolamally and Ahmad (2014) argued that principals should strive to equip teachers with transformative and sustainable skills. Additionally, it seemed from literature that to attain SE, teachers should be encouraged to join PLCs because, as stated by Kadji-Beltran et al. (2013), they would have ample opportunity to exchange knowledge about the most effective methods of teaching CC. This suggests that school principals should be sustainable leaders and that one of their most important duties is to support sustainable schools.

The study also showed that school principals' performance as instructional leaders determines whether a program is implemented successfully or not. Setting goals and a clear route to attaining them should be the first step in any organization's efforts to improve performance (Li et al., 2014; McCleskey, 2014; & Odumeru, 2013). This illustrates how crucial it is for school administrators to implement CCE in classrooms. Sustainable principles allow teachers to recommend changes the school can make to raise awareness of CC, and the leader may even agree. They look into teachers' areas of expertise and use logical and creative thinking to help them solve problems that may arise while pursuing academic objectives.

9. Conclusion and Recommendations

The paper concludes that principals are crucial to successfully implementing CCE and SE. Additionally, school principals need to be transformative leaders to support the successful implementation of CCE in their schools. They must be a change agent who sustainably guides schools and promote sustainability to achieve this. Additionally, SE would flourish if schools and their communities worked together. Therefore, the study suggests that school principals cultivate a transformative mindset and receive training in transformative and sustainable leadership techniques. We also recommend that school principals provide their teachers with SE training so that they can implement CCE in the classroom.

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