Sustainable leadership practices among school leaders and their relationship with school climate

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Article Info

ABSTRACT

Sustainable leadership practices ensure that the mission and vision of a school continue despite changes and challenges. Such a practice can build the capacity of the organization based on the environment, especially in shaping a better school climate. Past studies have found a significant link between school leadership practices and the school climate. However, there has been little discussion about the phenomenal relationship the in rural national secondary school (SMK) context. Hence, this study aimed to identify the level of sustainable leadership practices of principals and their relationship with the school climate in rural SMK in Malaysia. A total of 450 teachers were selected to participate in the study using proportionate random sampling and questionnaires were adopted as the research method. Due to the COVID-19 pandemic and the research population located in rural areas, data were collected through the mail. The findings showed that the level of sustainable leadership practices of the principals was high (M=4.18, SD=0.52), along with a high level of the school climate (M=4.14, SD=0.51). Sustainable leadership practices were also positively associated with school climate (r=0.607, p<0.05). These findings can be used by the Ministry of Education Malaysia to enhance sustainable leadership practices in the national education leaders professional qualifications designed specifically for future school leaders in Malaysia. In this regard, it is hoped that these findings will enrich the literature on sustainable leadership practices and the school climate.

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1.   INTRODUCTION

The United Nations has set a goal that by 2030, educated and skilled students from low-, middle-, and high-income nations will be educated and skilled in sustainable development. It may be accomplished through education, as shown in the fourth sustainable development goals (SDG) of the global agenda. The goal of the SDG is to provide quality education for all in order to create a peaceful and prosperous world [1]. However, the COVID-19 pandemic has caused negative consequences around the world, which had never been expected to occur in the past three years. The impact can be seen directly in individuals, society, the economy, and also in education globally. Schools in the United States and all around the world had to be closed as teaching and learning (TnL) had to be implemented in a virtual space during the pandemic [2]. Significant learning losses were apparent across Asia and the Pacific Region countries, requiring immediate recovery efforts to prevent adverse long-term effects on student learning progression, wellbeing, future wages, and economy-wide productivity [3]. The challenge was even worse when the society's economy was

affected to the extent that it caused a decline in the income of the head of the household, especially people living in rural areas [4].

The main challenge of education worldwide lies in the adaptation of the education system to the environment so that the objectives of the system can be achieved [5]. Therefore, the education system needs to remain sustainable for its goals to be achieved. The impact of change on the current world of education has led to school organizations becoming more complex where there is a cumulative response to the growing demand for diversity: diversity towards stakeholders, diversity of organizational structure and culture, diversity in the way in which information is processed and transmitted, diversity towards the number of people contributing to the tasks set, and diversity towards develop the goals of the organization in a sustainable direction [6]. This situation emphasizes the need for school leaders to have a great responsibility in ensuring that educational goals and agendas can continue to be preserved. Applying sustainable leadership practices is believed to have the potential to change organizational practices through reorienting and oversight missions to strengthen stakeholder commitments [7]. Sustainable leadership also has the potential to create a positive impact on performance targets, contributing to improvements in institutions and communities over a longer period of time.

The impact of changes and challenges in education are more significant in schools in rural areas. According to Rahaman *et al.* [8], rural schools are still far behind in terms of infrastructure and this problem is compounded by a lack of self-motivation among students who view education as less important. The findings of these studies are similar on the relationship between motivation and achievement of students in rural schools [9], which reported that the motivational level of rural students is at a moderate level and hence requires attention from both the school and the Ministry of Education Malaysia (MOE). In fact, the Ministry of Education acknowledged a digital gap among rural students, especially during the movement control order (MCO) in Malaysia. According to the Ministry of Education's online student readiness survey conducted between 28 March 2020 and 2 April 2020, a total of 670,118 respondents were parents to 893,331 students, of whom 6% had a personal computer, 9.3% owned a laptop, 5.8% possessed tablets, and 46.5% had smartphones. However, 36.9% of the students lacked devices to participate in online learning [10].

According to United Nations Children's Fund (UNICEF), innovation in education is not only geared towards the utilization of the latest technology in classrooms but also towards solving problems to increase students' interest and improve their learning so that they will not drop out [11]. In 2020, the MOE announced the achievement of *Sijil Pelajaran Malaysia* (SPM) year 2019. The results were especially encouraging for schools in rural areas. This is evidenced by the analysis of average grades by location which showed that the achievement of SPM candidates in rural areas had increased significantly compared to candidates who attended schools in urban areas. This has caused the attainment gap between the urban and rural areas to reduce to 0.38 in 2020 compared to 0.44 in 2019 [12].

Although Malaysia experienced the COVID-19 pandemic and MCO, the commitment of rural school organizations remains high in carrying out their responsibilities in delivering education for the success of students living in rural areas. In order to ensure that the sustainability of education can be continued, the leadership of a leader, which is based on sustainable leadership, serves as an opportunity to influence the lives of individuals for the better and to lead the organization towards the direction to be achieved [13]. Moreover, incompetent leaders develop weak organizations because the organizations are not built based on the appropriate work culture to maintain the sustainability of the organization. Past studies around the world also have proven that excellent and effective leaders will successfully manage all administrative matters, creating a positive environment that can improve student achievement and outcomes [14].

In the Malaysia Education Development Plan 2013–2025, MOE has targeted that by 2025 all schools' leaders in Malaysia need to practice instructional leadership and act as agents of change [14]. The issue is whether a new leader can sustain or improve his organization in a school with the culture and climate of the school formed by the previous leader. Sustainable leadership is the mainstay in the development of an organization since it is based on the importance of continuous learning [15]. By adopting sustainable leadership, an organization can become more innovative by making continuous improvements to gain continuous competitive advantage and create and sustain success [16]. This is because leaders who practice sustainable leadership implement a proactive approach by also building good relationships between internal and external stakeholders so that they are always sensitive to the changes that take place around them [17].

In conducting the current study, the researchers adapted seven basic principles of sustainable leadership in the world of education: i) depth in sustainable leadership matters; ii) length in sustainable leadership to last; iii) breadth in sustainable leadership to spread; iv) justice in sustainable leadership does not harm or improve its surrounding environment; v) diversity in sustainable leadership promotes cohesive diversity; vi) resourcefulness in sustainable leadership does not deplete human resources; and vii) conservation in sustainable leadership honors and learns from the best of the past to create an even better future [18]. These principles shape leaders through the various factors involved in creating a better quality and sustainable

working environment. Through sustainable leadership practices, leaders can lead an organization more clearly and effectively, allowing planning and actions to be made not only for short-term solutions but also for a longer period. Therefore, the continuity of sustainable leadership practices must be maintained to ensure that the sustainability of an organization can continue despite the changes in the school climate.

According to UNICEF [19], as a result of school closures due to the COVID-19 pandemic, students missed more than half of their schooling over the past two years and a total of 2 trillion hours of learning were lost. In the efforts to re-engage students to return to school and continue their education, school climate plays an important role. This is because school climate is a key factor in identifying the level of TnL delivery in schools to ensure that student achievement can be improved. Not only that a school climate affects students, but it also affects work culture. A school climate influences its organizational work culture, therefore positive school climate with sustainable leadership practices can form a better quality and competitive human capital. On the other hand, poor school climate results in a lack of focus and momentum to continue working [20], which ultimately results in unstable work delivery and inefficiency. This has raised concerns as school climate significantly affects the quality of teachers' work delivery [21].

However, the exploration of teacher perceptions of the impact of the school climate experience still raises questions to date [22]. There has been a tremendous need for educators, policymakers, and scholars to identify school climate as one of the main thrusts that can be used to improve the education system [23]. The school climate is formed based on the relationships between the school principal and teachers, the teacher and the teacher, the teacher and the staff, the teacher and the student, and the relationship between the students of a school [24]. Fisher and Frase [25] discovered eight individual psychosocial dimensions of school climate based on the perspectives of school teachers and develop the school-level environment questionnaire (SLEQ). Further, Johnson et al. [26] reviewed the SLEQ and develop a revised SLEQ that works equally well for all samples. The exploratory and validation factors of the school climate in this study were using five dimensions [26]: i) innovation in teaching; ii) collaboration; iii) decision-making participation; iv) school facilities; and v) student relations. Meanwhile, the three dimensions of professional interest, staff freedom, and work pressure are dropped. The revised SLEQ has produced a better model for studying the school climate and the experience of teachers in schools. It has become a reference and has been used by foreign and domestic researchers [27]–[29]. However, the revised SLEQ [26] limits the dimension of the school facilities to the facilities provided in the school's library. In this regard, to adapt this study to the current research which was conducted in rural areas in Malaysia, the questionnaires were improved by adding the list of school facilities and elements such as financial resources. This is also in line with the importance of school facilities, such as classrooms, laboratories, libraries, health facilities, and recreational facilities, besides TnL materials in improving the academic achievement of the students [30].

A school climate is an ideological pattern of life experience in schools that represents the norms, goal, value, relationship, TnL practice, and facilities, which also serve to support organizational involvement in achieving the organizational visions and missions [26]. In fact, schools are a place where students gain knowledge and hone their talents, hence poor school climate will affect their learning interest, thereby contributing to the issue of students dropping out of school. Leaders who practice sustainable leadership will work continuously to ensure that the school climate is in the best condition so that the sustainability of the school can be maintained and continued despite the challenges or crises that occur. Therefore, sustainable leadership practices are a must for school leaders to ensure that the spirit and philosophy of education are strictly adhered to in order to further enhance the achievement and success of their schools.

Sustainable leadership practice studies are not new in Malaysia. However, previous studies have only focused on primary and high-performing schools [31]–[35], despite the fact the leadership of the leaders in national secondary school (SMK) can be challenging as school leaders have to deal with students in difficult age groups who will eventually be the future leaders in the development of the country. Because there have been few studies on schools in rural areas, the current study examined SMK in rural areas. With that, three research questions on sustainable leadership practices among school leaders and their relationship to school climate were developed in the current study: i) what is the level of sustainable leadership practices among leaders in rural SMK?; ii) what is the level of school climate in rural SMK?; and iii) is there any relationship between sustainable leadership practices and school climate in rural SMK?

2. RESEARCH FRAMEWORK

To carry out this study, a conceptual framework was adapted from existing theories. The findings of past studies were referred to in building the conceptual framework of the study, as shown in Figure 1. The framework demonstrated the relationship between sustainable leadership practices among schools' principal variables theories [18] and the school climate variables model [26].
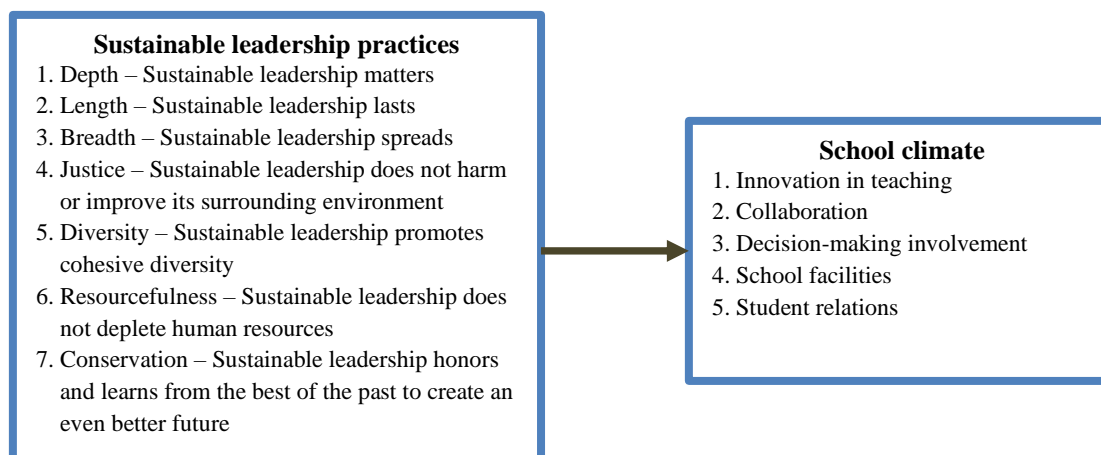
Sustainable leadership practices		School climate

Sustainable leadership practices
1. Depth – Sustainable leadership matters
2. Length – Sustainable leadership lasts
3. Breadth – Sustainable leadership spreads
4. Justice – Sustainable leadership does not harm or improve its surrounding environment
5. Diversity – Sustainable leadership promotes cohesive diversity
6. Resourcefulness – Sustainable leadership does not deplete human resources
7. Conservation – Sustainable leadership honors and learns from the best of the past to create an even better future

School climate
1. Innovation in teaching
2. Collaboration
3. Decision-making involvement
4. School facilities
5. Student relations

Figure 1. Conceptual framework

3. RESEARCH METHOD

This quantitative study identified the level of teachers' perception of principals' sustainable leadership practices and their relationship with the school climate in rural SMK in Malaysia. In this regard, the objectives of this study were to identify: i) the level of sustainable leadership practices among leaders in rural SMK; ii) the level of school climate in rural SMK; and iii) the relationship between sustainable leadership practices and the school climate in rural SMK. A quantitative method was employed because the empirical research provides accurate and generalized measurements of a population [36], [37]. A quantitative method is also suitable for researchers to know the cause-effect relationship between two variables based on mathematics, calculations, and statistics. In this regard, the use of the quantitative method was in line with the purpose of this study, which was to identify the perception of teachers on their principals' sustainable leadership practices in rural SMK in Malaysia.

The research population involved teachers from rural SMK in Johor, Melaka, Negeri Sembilan, Selangor, Perak, Kedah, Perlis, Pahang, Terengganu, Kelantan, Sabah, and Sarawak. However, the Federal Territory of Kuala Lumpur, the Federal Territory of Putrajaya, and the Federal Territory of Labuan were not involved in the study since the states do not have rural SMK. The total population size in this study was 35,528 teachers from 585 rural SMK [38]. Based on the recommendations, a sample size should consist of at least 390 respondents and not more than 500 respondents [39]–[42]. Because the number of participating schools was determined based on proportionate random sampling, the required sample size of 470 teachers was needed. There was an inclusion of a 20% increase in the required sample size to accommodate respondents who may withdraw and to supplement in the event of damage to the questionnaire instrument [43], [44]. Furthermore, the 470 teachers involved in this study were selected using a random number generator. To ensure that the data obtained is valid and reliable, the data screening process was done by removing the patently answered data sets and issuing data sets of extreme value based on outlier tests using SPSS. As a result, three data sets were removed for answering on a patent basis and seventeen questionnaires were also removed for having a high outlier value. Overall, 450 data sets were accepted and analyzed in this study. The summary of the research population and sample of the current study is shown in Table 1.

Questionnaires were utilized as an instrument of the study to obtain key information from respondents. The distributed questionnaires consisted of three parts, namely part A related to the demographics, part B related to sustainable leadership practices, and part C related to the school climate. Part A comprised respondents' information, namely gender, age, length of service, length of service in the current school, top academic, position grade, and position held at school. Part B followed with seven dimensions represented by 60 items adapted from the sustainable leadership practices model [18], as well as from other literatures [31], [32]. Meanwhile, part C consisted of 62 items representing the five dimensions of the school climate model based on the SLEQ (environmental questionnaire). The SLEQ has been used by past researchers to measure individual psychosocial constructs in school environments based on the perspectives of teachers in schools [25], [26]. Therefore, to adapt the school climate to the present situation, the present study adapted from the SLEQ reviewed [26] and utilized literature reviews [29], [30], [45]. In addition, improvements were made to the dimension of school facilities by including appropriate and adequate facilities in schools such as classrooms, laboratories, libraries, recreational facilities, financial resources, and TnL equipment and materials in the dimension [30].

Table 1. Research population and sample for SMK in rural area

Region	State in Malaysia	Ratio calculation	Total school sample	Total teacher samples
North	Perak	42[a]×47[b]/585[c]	3	3×10[d]=30
	Pulau Pinang	1[a]×47[b]/585[c]	1	1×10[d]=10
	Kedah	14[a]×47[b]/585[c]	1	1×10[d]=10
	Perlis	8[a]×47[b]/585[c]	1	1×10[d]=10
South	Negeri Sembilan	27[a]×47[b]/585[c]	2	2×10[d]=20
	Melaka	7[a]×47[b]/585[c]	1	1×10[d]=10
	Johor	67[a]×47[b]/585[c]	5	5×10[d]=50
Middle	Selangor	8[a]×47[b]/585[c]	1	1×10[d]=10
East	Pahang	98[a]×47[b]/585[c]	8	8×10[d]=80
	Kelantan	17[a]×47[b]/585[c]	1	1×10[d]=10
	Terengganu	40[a]×47[b]/585[c]	3	3×10[d]=30
Borneo	Sabah	141[a]×47[b]/585[c]	11	11×10[d]=110
	Sarawak	115[a]×47[b]/585[c]	9	9×10[d]=90
	Total		47	470

a. Number of school population in rural areas by the state in Malaysia
b. Number of schools samples in rural areas in Malaysia
c. Number of population of schools in rural areas in Malaysia
d. Number of samples per school

To ensure that the data collection procedures were complied with, permission to conduct research was obtained from the Education Policy Planning and Research Division of the MOE, the State Education Department (SED), the State Education Office (SEO), and the schools involved. The distribution and collection of the survey forms were carried out by post due to the COVID-19 pandemic and the spread of influenza outbreaks. Also, the method of using the post was chosen, instead of other forms of communication, due to the schools involved in this study were located in rural areas, which may have internet access problems.

The respondents' responded to the questionnaire items to show their level of consent based on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=less agree, 4=agree, and 5=very agree). The process of validity and reliability in conducting quantitative studies is of paramount importance in identifying the degree of reliability of the instruments produced in order to ensure that the questionnaire items can be replicated and that their validity can accurately measure the variables [37]–[46]. To test the validity of the developed instruments, the Item Specification Table was developed to facilitate the process of setting the content of the fields studied to be more structured and systematic for evaluation by three experts in the field of research. Their views were also taken into account in improving the items to suit the Malaysian context.

The quantitative data for expert consensus were analyzed by obtaining the consensus mean score for each item evaluated by the expert using SPSS version 26 software. The mean score between 4.00 and 5.00 was maintained since the score indicated a high consent level, while the mean score between 3.00 and 3.99 was modified since the score indicated a moderate level. Items with low mean levels, particularly between 1.00 and 2.99, were eliminated [47]. In order to implement content validity, improvements to the questionnaire were done as suggested by the experts. Overall, all items had a high mean score of between 4.00 and 5.00, while two items in the sustainable leadership dimension received a moderate mean score of between 3.00 and 3.99. The two items were improved as suggested by the experts.

According to Sekaran [48], reliability refers to the accuracy of a measuring tool in evaluating a concept to be studied. Creswell [49] explained that reliability refers to the stability and internal consistency of an instrument. The reliability of the constructed items can be evaluated by using the coefficient correlation through Cronbach's alpha [50]. Based on Pallant [51] and Konting [52], the value of Cronbach's alpha coefficient at <0.9 is deemed very high, followed by <0.70 to <0.89 at a high level, and <0.31 to <0.69 at a medium level, while Cronbach's alpha coefficient at <0.30 is considered at a low level. Overall, both variables were at high coefficient levels where out of 105 items, 77 items obtained a very high Cronbach's alpha coefficient value of <0.9 and 28 items scored a high Cronbach's alpha coefficient of <0.70 to <0.89.

SPSS version 26 software was used for descriptive and inferential analyses. Descriptive analysis was performed to generate the frequency, percentage, mean score, and standard deviation of the responses in order to answer the first and second research questions. The levels of sustainable leadership practices among school leaders and the school climate were determined by the mean score interpretation as proposed by Mutalib [53] and Yusoff [54], depicted in Table 2. To answer the third question, a correlation analysis using Pearson's inference was used to conclude the link between school principals' sustainable leadership and school climate. The conventional approach to interpreting the correlation coefficients based on Senthilnathan [55] was employed, as depicted in Table 3.

Table 2. Mean score interpretation

Mean score	Interpretation
4.21-5.00	Very high
3.41-4.20	High
2.61-3.40	Moderate
1.81-2.60	Low
1.00-1.80	Very low

Table 3. Correlation coefficient interpretation

Magnitude observed	Interpretation
$-0.70 \geq r > -1.00$ or $+0.70 \leq r < +1.00$	Very strong correlation
$-0.50 \geq r > -0.70$ or $+0.50 \leq r < +0.70$	Strong correlation

4. RESULTS AND DISCUSSION

The demographics of the teacher respondents in rural SMK in Malaysia were structured based on their gender, age, years of service, and educational background as shown in Figure 2. The mean scores, frequencies, and percentages of the responses for the dimensions of sustainable leadership of school principals and the dimensions of school climate in the survey are shown in Figures 3 and 4. Meanwhile, the correlation between sustainable leadership and school climate is shown in Table 4.

4.1. Profile of respondents

Figures 2-4 displays the demographic profiles of the 450 respondents in term of their gender, education background and age. The respondents were 450 teachers from SMK in rural areas in the state of Johor, Melaka, Negeri Sembilan, Selangor, Perak, Kedah, Perlis, Pahang, Terengganu, Kelantan, Sabah, and Sarawak. According to the data, 268 (59.6%) of the respondents are female teachers, while 182 (40.4%) are male teachers. Furthermore, 355 teachers (78.9%) hold a Bachelor's Degree as their highest degree of education. The data also reveals that most of participants had less than a Master degree, with 84 (18.7%) teachers. When it comes to age groups, the 41-45 age group has the highest number, with 102 teachers, at 22.7%.
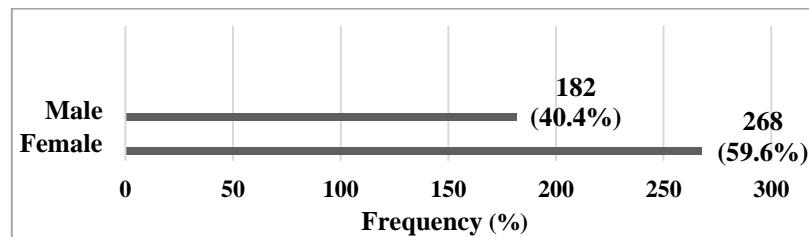

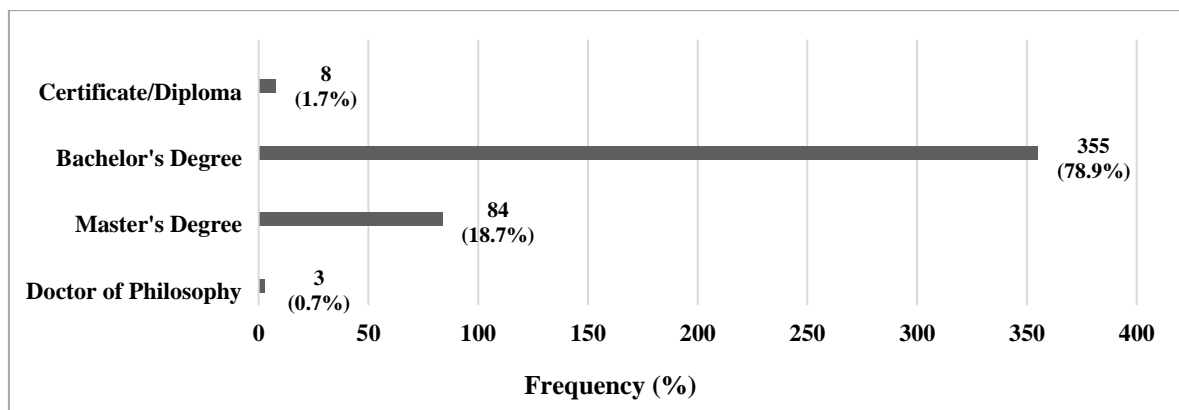
Figure 2. Respondents' gender
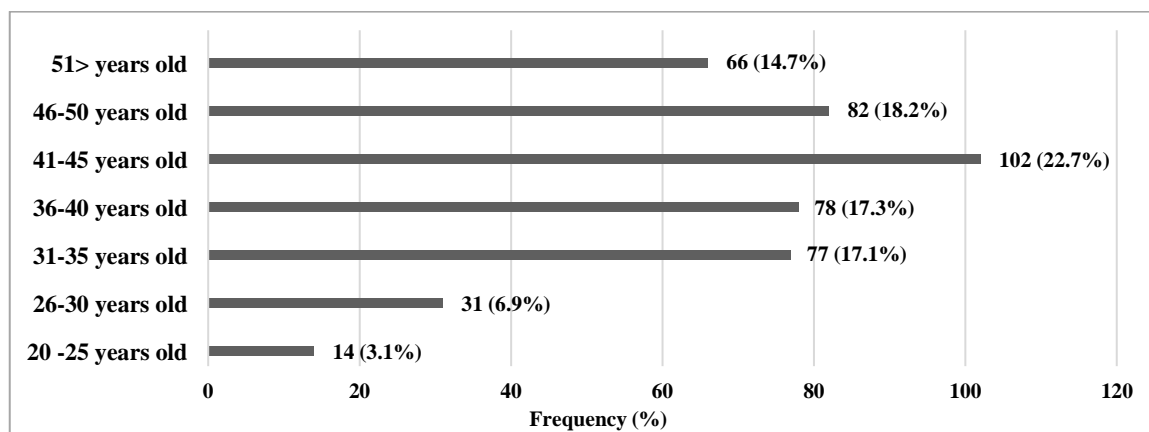

Figure 3. Respondents' highest education

Figure 4. Respondents' age

4.2. Sustainable leadership

The first objective of this study was to identify the level of sustainable leadership practices of school principals of rural SMK in Malaysia. The findings showed that the mean value of sustainable leadership practices among school principals was at a high level of 4.18 (SD=0.52), as shown in Table 4. Based on the mean score range interpretation [53], [54], the mean score range of 3.41–4.20 is considered high (Table 2). This demonstrates that the principals of rural SMK practiced sustainable leadership in their school climate. The dimension of depth in sustainable leadership had the highest mean value of 4.31 (SD=0.44). Meanwhile, the mean value for the dimension of length in sustainable leadership was 4.17 (SD=0.53), followed by breadth in sustainable leadership with 4.14 (SD=0.54), justice in sustainable leadership with 4.18 (SD=0.51), diversity in sustainable leadership with 4.16 (SD=0.56), resourcefulness in sustainable leadership with 4.19 (SD=0.52), and finally conservation in sustainable leadership with 4.16 (SD=0.57). In conclusion, all dimensions were at a high mean score level.

The overall level of sustainable leadership practices of principals identified in this study is in line with previous findings [33]–[35] which indicate that school principals consistently practice sustainable leadership consciously or otherwise. However, strong and effective school principals or leaders who implement responsive leadership do not engage in such a work culture in an instant. According to Williams [56], leadership practices are formed from several factors such as their environmental experience and the effectiveness of future school leader preparation programs organized by their organizations. Nevertheless, it is evident that the practice of sustainable leadership among principals is recognizable by teachers. With this, it helps teachers to feel more at ease in the school climate by allowing them to remain with their respective organizations and minimizing dissatisfaction with their school leadership.

Table 4. Overall mean for the dimensions of sustainable leadership among school principals in rural SMK

No.	Dimension	Mean	Std. Deviation	Interpretation
1.	Depth–sustainable leadership matters	4.31	0.45	Very high
2.	Length–sustainable leadership lasts	4.17	0.53	High
3.	Breadth–sustainable leadership spreads	4.14	0.54	High
4.	Justice–sustainable leadership does not harm or improve its surrounding environment	4.18	0.51	High
5.	Diversity–sustainable leadership promotes cohesive diversity	4.16	0.56	High
6.	Resourcefulness–sustainable leadership does not deplete human resources	4.19	0.52	High
7.	Conservation–sustainable leadership honors and learns from the best of the past to create an even better future	4.16	0.55	High
	Total	4.18	0.52	High

4.3. School climate

The second objective of this study aimed to identify the school climate level in rural SMK in Malaysia. Table 5 showed that the overall school climate of rural SMK was at a high level with a mean value of 4.14 (SD=0.51), as interpreted by Mutalib [53] and Yusoff [54]. Table 2 shows that the mean score ranging from 3.41 to 4.20 was considered high. This demonstrates that the school climate in the rural areas had a positive and conducive working environment. The dimension of collaboration among teachers was the highest with a mean value of 4.36 (SD=0.43), followed by innovation in teaching with 4.14 (SD=0.57),

decision-making engagement with 4.24 (SD=0.48), student relations with 4.19 (SD=0.51), and school facilities with 3.76 (SD=0.56). In short, all dimensions were at high mean score levels. The findings are different from the previous studies [29], [57], where the overall school climate is at a very high level. According to Som and Ali [58], this could be closely related to experience and observation, making it difficult for teachers to respond to a change in their organization. In addition, the facilities and the supply of TnL resources provided by schools should also be sufficient and in a good condition to make sure they are easily accessible and available to teachers [26]–[30].

In order to implement 21st century learning, changes in the curriculum and facilities in schools must be made. This not only attracts students to learn but also ensures that they are exposed to the correct use of technology-based equipment and learning materials. The findings of this study showed that school facilities in rural SMK in Malaysia recorded a mean score of 3.76 (SD=0.51). Although it had the lowest mean score among other components, it was interpreted to be at a high level. However, attention should be given to the finding as facilities play a major role in the school climate. Therefore, the provision of appropriate and adequate resources and facilities is also essential in an attempt to create a more conducive school climate.

Table 5. Overall mean for the dimensions of school climate in rural SMK

No.	Dimension	Mean	Std. Deviation	Mean interpretation
1.	Innovation in teaching	4.14	0.57	High
2.	Collaboration	4.36	0.43	Very high
3.	Decision-making involvement	4.24	0.48	Very high
4.	School facilities	3.76	0.56	High
5.	Student relations	4.19	0.51	High
	Total	4.14	0.51	High

4.4. Relationship between sustainable leadership and school climate

The third objective of this study aimed to identify the relationship between the principals' sustainable leadership practices and the school climate in rural SMK in Malaysia. The findings in Table 6 show that the practice of sustainable leadership of principals and school climate had a strong correlation. As interpreted by Senthilnathan [55] as depicted in Table 3, the correlation coefficient (r=0.607, $p<0.05$) was at an observation of magnitude $+0.50 \leq r < +0.70$. This indicated a strong correlation between the two variables. Based on the findings, the principals were able to create an organization that could sustain changes and challenges by creating a positive working climate that lasts. This shows that the principals have been adopting sustainable leadership practices when managing their schools, demonstrating that there is a relationship between sustainable leadership practices and the school climate. This also demonstrates the readiness of schools to constantly accept challenges and changes due to both current and future needs.

Research by Hargreaves and Fink [18] explain that sustainable leadership refers to a leader's practice in adopting sustainable education-based leadership to improve, preserve, and develop deep learning to be disseminated in the long run. Such a practice is implemented in a non-harmful way and creates positive benefits for everyone around them, now and in the future. Research by Cohen et al. [59] also explain that the school climate refers to life in the school that involves its relationships, operations, and environment. The school climate gives a good effect or vice versa, affecting the behavior or commitment of the person in it. This means that a healthy school climate can focus on academics, while leaders can influence teachers' commitment and raise the belief that they have an impact on learning and teaching [60]. However, Talip and Malinkun [61] argued that the school climate is on average for everyone in a school.

Nevertheless, even with the availability of school facilities, information and communications technology (ICT) needs to be improved in rural SMK to enhance innovation in learning. This is beyond the control of the school principals as the education development allocation is under the supervision of the MOE. However, attempts have been made by the principals in rural SMK through acquiring donations from external agencies to ensure that the facilities in their schools do not lag behind the urban schools.

School is a place to form capable human capital to replace now-national leaders in the future. The main purpose of a school is not only to produce excellent human capital in terms of physical, emotional, intellectual, personality, and social but to produce individuals who can meet the demands of the job market [33]. By adopting sustainable leadership, principals can ensure the continuity of planning so that schools can continue their efforts to achieve their objectives. The practice is also guided by the appropriateness of the school climate to the extent that it is able to create human capital that can achieve the visions and missions of the school.

Table 6. Pearson correlation between sustainable leadership and school climate in rural SMK

Correlation coefficient	
	Sustainable leadership
School climate	0.607*

*p<0.05

5. CONCLUSION

Based on the findings of this study, it is concluded that SMK in rural areas has principals with a high level of sustainable leadership practices, a positive school climate, and a strong positive relationship between sustainable leadership and the school climate. There is still room and opportunity to ensure that this desire is achieved by incorporating elements of sustainable leadership in school leaders. The study also reveals that rural SMK in Malaysia have the lowest mean value of school facilities, but sustainable leadership practices can improve the school climate. These practices help leaders navigate differences in facilities, culture, and social economy, enabling them to pursue their mission and vision. Sustainable leadership builds relationships, enhances organizational knowledge, and prepares leaders for future leadership roles. This positive work environment contributes to excellence towards the Malaysia Education Development Plan 2013–2025 and adherence to SDGs by 2030 in terms of providing quality education with access to inclusive and equitable quality education, besides encouraging lifelong learning.

This study suggests that the Malaysia Ministry of Education places special emphasis on a special syllabus in preparation for school leaders on the best practices in sustainable leadership. For instance, during the National Professional Qualification for Educational Leaders course. There is also a need to upgrade the facilities in rural schools to provide a better and more conducive school climate. To further enhance the practice of start-up leadership, the State of Education Departments in all countries need to continuously implement assessments in order to identify sustainable leadership practices of principals in the state and plan appropriate activities to improve their practices, if necessary. To better explore the relationship between sustainable leadership practices and school climate, future studies should examine the relationship between sustainable leadership practices and school climate, focusing on teachers' commitment levels. The study should also consider school leaders' perceptions of sustainable leadership practices to validate findings. Incorporating principals as respondents could provide in-depth insights into sustainable leadership reasons.

REFERENCES

[1] United Nations: Department of Economic and Social Affairs, *The sustainable development goals report 2022*. United Nations, 2022.
[2] H. Morgan, "Best practices for implementing remote learning during a pandemic," *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, vol. 93, no. 3, pp. 135–141, May 2020, doi: 10.1080/00098655.2020.1751480.
[3] R. Molato-Gayares *et al.*, "How to recover learning losses from COVID-19 school closures in Asia and the Pacific," *ADB Briefs*, no. 217, pp. 1–11, 2022, doi: 10.22617/BRF220301-2.
[4] K. H. Kamarudin, M. F. Rashid, and N. Loganathan, "COVID-19 impact on socioeconomic sustainability of rural areas in Malaysia: Segamat Johor District Case Study," (in Malay) *Journal of Education and Social Sciences*, vol. 18, no. 3, p. 33, 2021.
[5] A. Schleicher, "Education disrupted – education rebuilt: Some insights from PISA on the availability and use of digital tools for learning," OECD Education and Skills Today, 2020. [Online]. Available: https://oecdedutoday.com/coronavirus-education-digital-tools-for-learning/ (accessed Nov. 11, 2021).
[6] N. K. Malik, "Sustainable leadership and school improvement-a conceptual research," in *2021 Sustainable Leadership and Academic Excellence International Conference (SLAE)*, Nov. 2021, pp. 1–8. doi: 10.1109/SLAE54202.2021.9788098.
[7] P. N. Aung and P. Hallinger, "Research on sustainability leadership in higher education: a scoping review," *International Journal of Sustainability in Higher Education*, vol. 24, no. 3, pp. 517–534, Feb. 2023, doi: 10.1108/IJSHE-09-2021-0367.
[8] A. A. Rahaman, M. J. A. Rahman, S. A. M. Alias, N. A. Roslan, and N. Daud, "STEM applications in teaching and facilitation in rural schools: opportunities and challenges," (in Malay), in *International Conference on Education and Regional Development 2018 (ICERD 3rd 2018)*, 2018, pp. 1–5.
[9] W. N. W. Jaafar and S. M. Maat, "The relationship between motivation and mathematics achievement among rural school students," (in Malay), *Jurnal Pendidikan Sains and Matematik Malaysia*, vol. 10, no. 1, pp. 39–48, 2020, doi: 10.37134/jpsmm.vol10.1.5.2020.
[10] M. N. Parzi, "No devices make learning difficult online," (in Malay), *BHOnline*, 2020. [Online]. Available: https://www.bharian.com.my/berita/nasional/2020/07/711421/tiada-peranti-sukarkan-pembelajaran-dalam-talian (accessed Nov. 18, 2021).
[11] UNICEF, "Strengthening education systems and innovation: getting all children in school and learning takes strong, innovative education systems," United Nation Children's Fund (UNICEF), 2022. [Online]. Available: https://www.unicef.org/education/strengthening-education-systems-innovation (accessed Nov. 11, 2021).

[12] Ministry of Education Malaysia, "Malaysian certificate of education results analysis report (SPM) year 2020," (in Malay), 2020. [Online]. Available: https://www.moe.gov.my/muat-turun/laporan-dan-statistik/lp (accessed Oct. 25, 2021).

[13] P. Miller, V. Gaynor, C. Powell, S. Powell, and E. Simpson, "Leadership as sustainability: context and primary school principals in Jamaica," *Journal of School Leadership*, vol. 29, no. 2, pp. 130–149, Mar. 2019, doi: 10.1177/1052684619832153.

[14] Ministry of Education Malaysia, *Malaysia education development plan 2013-2025 (preschool to post-secondary education)*. Putrajaya: Ministry of Education Malaysia (in Malay), 2013.

[15] A. Al-Zawahreh, S. Khasawneh, and M. Al-Jaradat, "Green management practices in higher education: the status of sustainable leadership," *Tertiary Education and Management*, vol. 25, no. 1, pp. 53–63, Mar. 2019, doi: 10.1007/s11233-018-09014-9.

[16] N. T. Nisha, N. Nawaz, J. Mahalakshmi, V. Gajenderan, and I. Hasani, "A study on the impact of sustainable leadership and core competencies on sustainable competitive advantage in the information technology (IT) sector," *Sustainability*, vol. 14, no. 11, pp. 1–12, Jun. 2022, doi: 10.3390/su14116899.

[17] L. Gerard, J. McMillan, and N. D'Annunzio-Green, "Conceptualising sustainable leadership," *Industrial and Commercial Training*, vol. 49, no. 3, pp. 116–126, Mar. 2017, doi: 10.1108/ICT-12-2016-0079.

[18] A. Hargreaves and D. Fink, *Sustainable leadership*. Hoboken NJ: Wiley, 2006.

[19] UNICEF, "Are children really learning? Exploring foundation skill in the midst of a learning crisis," *United Nation Children's Fund (UNICEF)*, 2022. [Online]. Available: https://data.unicef.org/resources/are-children-really-learning-foundational-skills-report/ (accessed Jul. 22, 2022).

[20] M. S. B. M. Hussin and R. B. A. Rahman, "The influence of the school climate and commitment to teachers in Malaysia," *Jurnal Penyelidikan Sains Sosial (JOSSR)*, vol. 3, no. 9, pp. 101–113, 2020.

[21] V. H. Manla, "School climate: its impact on teachers' commitment and school performance," *Journal of World Englishes and Educational Practices*, vol. 3, no. 2, pp. 21–35, Feb. 2021, doi: 10.32996/jweep.2021.3.2.3.

[22] S. Maxwell, K. J. Reynolds, E. Lee, E. Subasic, and D. Bromhead, "The impact of school climate and school identification on academic achievement: multilevel modeling with student and teacher data," *Frontiers in Psychology*, vol. 8, pp. 1–21, Dec. 2017, doi: 10.3389/fpsyg.2017.02069.

[23] S. Longobardi, M. M. Pagliuca, and A. Regoli, "School climate and academic performance of Italian students: the role of disciplinary behaviour and parental involvement," *Statistical Methods & Applications*, vol. 31, no. 5, pp. 1355–1373, Dec. 2022, doi: 10.1007/s10260-022-00632-7.

[24] Syahril and Hadiyanto, "Improve school climate for better quality education management," *Journal of Educational and Learning Studies*, vol. 1, no. 1, pp. 16–22, Dec. 2018, doi: 10.32698/0182.

[25] D. L. Fisher and B. J. Fraser, "Validity and use of the school-level environment questionnaire," *Annual Meeting of the American Educational Research Association*, pp. 16–20, 1990.

[26] B. Johnson, J. J. Stevens, and K. Zvoch, "Teachers' perceptions of school climate," *Educational and Psychological Measurement*, vol. 67, no. 5, pp. 833–844, Oct. 2007, doi: 10.1177/0013164406299102.

[27] S. Manca, V. Cerina, V. Tobia, S. Sacchi, and F. Fornara, "The effect of school design on users' responses: a systematic review (2008–2017)," *Sustainability*, vol. 12, no. 8, pp. 1–37, Apr. 2020, doi: 10.3390/su12083453.

[28] S. N. Syaima and M. H. Nuruhuda, "Relationship between school climate and primary school teachers performance," *Science International (Lahore)*, vol. 32, no. 2, pp. 139–141, 2020.

[29] M. A. B. M. Kasim, S. N. Ismail, S. Mohammad, and H. Ibrahim, "School climate and teachers' commitments in Kelantan State religious school of religious Aid," (in Malay), *Proceedings of The ICECRS*, 2016, pp. 699–708. doi: 10.21070/picecrs.v1i1.543.

[30] H. A. bin Zainuddin and F. binti Subri, "The school facilities towards the improvement of students' academic achievement: case study-secondary schools in Klang," *Journal of Modern Education Review*, vol. 7, no. 9, pp. 647–653, 2017.

[31] M. I. M. Hamzah, N. S. Alias, and B. Salwana, "Sustainable leadership practices of the school administration and its relationship with the competence of the teacher's constant professionalism," (in Malay), *Jurnal Pengurusan dan Kepimpinan Pendidikan*, vol. 31, no. 1, pp. 69–79, 2020.

[32] M. T. Jamil and A. H. A. Hamid, "Headmaster's sustainable leadership practices and their relationship with teacher work satisfaction at the Federal Territory of Kuala Lumpur high performance primary school," (in Malay), *International Seminar on Educational*, 2018, pp. 111–115.

[33] R. N. R. H. Shah and M. Y. M. Nor, "Headmaster's sustainable leadership practices and teacher work satisfaction at Sekolah Kebangsaan Padang Jawa Shah Alam," (in Malay), *Jurnal Dunia Pendidikan*, vol. 3, no. 1, pp. 385–393, 2021.

[34] Z. Zakaria and M. I. M. Hamzah, "Sustainable leadership practices of the principal of Harian Middle School in Gombak District, Selangor," (in Malay), *International Conference on Innovative Approaches in Business, Education and Technology*, 2020, pp. 159–168.

[35] N. S. N. Sasliza and M. H. M. Izham, "Sustainable leadership practices of principals and the effectiveness of National Schools in Hulu Langat, Selangor," (in Malay), *JuPiDi: Jurnal Kepimpinan Pendidikan*, vol. 7, no. 3, pp. 20–37, 2020.

[36] S. Ahmad, S. Wasim, S. Irfan, S. Gogoi, A. Srivastava, and Z. Farheen, "Qualitative v/s. quantitative research-a summarized review," *Journal of Evidence Based Medicine and Healthcare*, vol. 6, no. 43, p. 2828, 2019, doi: 10.18410/jebmh/2019/587.

[37] E. R. Babbie, *The practice of social research*, 14th ed. Boston MA: Cengage Learning, 2016.

[38] "Statistics of schools, students and teachers," (in Malay), Ministry of Education Malaysia (MOE), 2020. [Online]. Available: https://www.moe.gov.my/statistik-menu/statistik-bilangan-sekolah-murid-guru (accessed Aug. 18, 2020).

[39] U. Sekaran and R. Bougie, *Research methods for business: a skill-building approach*, 7th ed. John Wiley & Sons Ltd., 2016.

[40] J. T. Roscoe, *Fundamental research statistics for the behavioral sciences*, 2nd ed. New York: Holt, Rinehart and Winston, 1975.

[41] R. V. Krejcie and D. W. Morgan, "Determining sample size for research activities," *Educational and Psychological Measurement*, vol. 30, no. 3, pp. 607–610, Sep. 1970, doi: 10.1177/001316447003000308.

[42] J. Cohen, "A power primer," *Psychological Bulletin*, vol. 112, no. 1, pp. 155–159, 1992, doi: 10.1037/0033-2909.112.1.155.

[43] J. Fraenkel and N. Wallen, *How to design and evaluate research in education*, 7th ed. McGraw-Hill Higher Education, 2009.

[44] M. R. A. Rahman, "Quality management practices and their relationship with teacher quality: the mediator effects of principals' transformational leadership," (in Malay), Ph.D. dissertation, Universiti Kebangsaan Malaysia, Malaysia, 2021.

[45] A. Anathuri and R. Basri, "The school's climate relationship with teacher commitment in Kajang Zone," (in Malay), *Journal of Global Business and Social Entrepreneurship (GBSE)*, vol. 5, no. 16, pp. 101–111, 2019.

[46] N. Golafshani, "Understanding reliability and validity in qualitative research," *The Qualitative Report*, vol. 8, no. 4, pp. 597–607, Jan. 2015, doi: 10.46743/2160-3715/2003.1870.

[47] R. Johari, "Assessment of the implementation of primary school standard curriculum (KSR) of world science and technology subjects," (in Malay), Ph.D. dissertation, Universiti Kebangsaan Malaysia, Malaysia, 2017.

[48] U. Sekaran, *Research methods for business: a skill building approach*. Singapore: Wiley, 2003.

[49] J. W. Creswell, *Research design: qualitative, quantitative, and mixed methods approaches*, 3rd ed. Thousand Oaks, CA: Sage Publications, 2009.
[50] G. Darusalam and S. Husin, *Research methodology in education: study practice and analysis*, 3rd ed. Kuala Lumpur: Universiti Malaya (in Malay), 2021.
[51] J. Pallant, *SPSS survival manual: a step by step guide to data analysis using IBM SPSS*, 4th ed. McGraw-Hill Education, 2010.
[52] M. M. Konting, *Educational research methods*, 5th ed. Kuala Lumpur: Dewan Bahasa & Pustaka (in Malay), 2005.
[53] S. A. Mutalib, "Assessment of the implementation of formative assessment at Kedah Pre-School, Malaysia," (in Malay), Ph.D. dissertation, Universiti Kebangsaan Malaysia, Malaysia, 2015.
[54] M. A. M. Yusoff, "Evaluation of training programme in school-based assessment services," (in Malay), Ph.D. dissertation, Universiti Kebangsaan Malaysia, Malaysia, 2016.
[55] S. Senthilnathan, "Usefulness of correlation analysis," *SSRN Electronic Journal*, pp. 1–9, 2019, doi: 10.2139/ssrn.3416918.
[56] N. Williams, "Culturally responsive leadership in Aotearoa New Zealand secondary schools," Master Thesis, Auckland University of Technology, 2016.
[57] Y. J. Yun and N. M. Nordin, "The relationship between school organizational climate and teacher job satisfaction," (in Malay), *International Conference of Future Education and Advance*, 2020, pp. 6–11.
[58] H. M. Som and S. K. S. Ali, "Teacher's commitment in curriculum implementation and effective innovation," (in Malay), *Masalah Pendidikan*, vol. 34, pp. 99–119, 2011.
[59] J. Cohen, E. M. Mccabe, N. M. Michelli, and T. Pickeral, "School climate: research, policy, practice, and teacher education," *Teachers College Record: The Voice of Scholarship in Education*, vol. 111, no. 1, 2009, doi: 10.1177/016146810911100108.
[60] E. L. E. Fei and C. G. K. Han, "The relationship of principal leadership and school climate with teacher motivation (in Malaysia)," *Malaysia Journal of Social Sciences and Humanities*, vol. 3, no. 2, pp. 1–16, 2018, doi: 10.47405/mjssh.v3i2.70.
[61] R. bin Talip and R. bin Malinkun, "The relationship between school organizational climate and teacher emotional intelligence competence as a mediator for the quality of generation 'Y' teachers in Kudat regional high schools," (in Malay), *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, vol. 5, no. 3, pp. 58–78, Mar. 2020, doi: 10.47405/mjssh.v5i3.372.

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