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School Heads' Leadership Quality, Organizational Climate, and Learning Environment as Predictors of Teachers' Innovativeness

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Abstract. This study aimed to investigate the impact of school administrators' leadership quality, organizational climate, and learning environment on teachers' innovativeness in elementary and secondary public schools in the Lagonglong District, Misamis Oriental Division. Employing a descriptive-correlational and causal research design, the study included public school teachers as participants. Data were collected using proportionate stratified random sampling and analyzed with descriptive statistics, correlational analysis, and multiple regression analysis. The findings revealed a highly positive educational landscape characterized by effective leadership, a supportive organizational climate, conducive learning environments, and a culture of innovation among teachers. Significant positive relationships were identified between school leaders' leadership quality, organizational climate, learning environment, and teachers' innovativeness. Enhanced leadership quality, a favorable organizational climate, and a nurturing school learning environment were associated with increased levels of teacher innovation. The study emphasized the importance of leadership development, creating positive climates, supportive learning environments, and fostering an innovative culture to achieve long-term educational excellence. Multiple regression analysis identified significant predictors of teachers' innovativeness, with organizational climate being statistically significant. The results demonstrated the influential impact of quality leadership, organizational climate, and learning environment on teacher innovativeness in school settings. Effective communication and team building were key contributing factors to enhancing innovative teaching. Schools developed team-building activities, communication strategies, a common vision, and meaningful support to inspire and guide teachers in creating an environment conducive to innovative learning.

Keywords: Teacher innovativeness; School leadership; Organizational climate; Learning environment.

1.0 Introduction

In exploring effective educational practices, teachers' innovativeness emerges as a crucial element influencing learning dynamics and student outcomes (Anaktototy, 2023). Innovative pedagogies, encompassing holistic approaches, adaptability, and continuous improvement, are pivotal for enhancing student experiences (Peterson et al., 2018). Teachers, as key figures in education, must foster adaptability and inspiration, catering to diverse learning styles through varied strategies (Chia & Goh, 2016; Ukpokodu, 2019). In the context of the Fourth Industrial Revolution (4IR), rapid technological advances and evolving pedagogies underscore the importance of teacher innovation (Haleem et al., 2022; Kovacs, 2017).

Research highlighted the transformative power of dedicated teachers in preparing students for future challenges by linking classroom learning to real-world applications and equipping them with critical 21st-century skills

(Grigoropoulos, 2021; Han & Abdrahim, 2023). Despite theoretical discussions, there is a scarcity of empirical studies examining how leadership, organizational climate, and learning environment impact teacher innovativeness, particularly in specific geographic contexts like the Lagonglong District (Aquino et al., 2021; Oco, 2022).

Using a hybrid methodology combining qualitative insights from focus group discussions and in-depth interviews, the study seeks to fill this gap by exploring leadership quality, organizational climate, and learning environment dynamics. Theoretical frameworks like Transformational Leadership (Burns, 1978), Path-Goal Theory (House, 1971), and Diffusion of Innovations (Rogers, 1962) guide the research. These frameworks emphasize the role of leaders in fostering innovation, creating conducive environments, and understanding the adoption of new practices (Fairhan et al., 2023; Hasbi, 2018; Daing & Mustapha, 2023).

The study aims to provide insights into how school leaders can influence teacher innovativeness through their practices, organizational climate, and the learning environment, with a focus on the Lagonglong District. Findings are expected to inform leadership training, enhance organizational climates, and improve teaching methods and curricula, ultimately contributing to educational research and practice in the Philippines (Peschl, 2023; Akbar, 2020).

2.0 Methodology

2.1 Research Design

The study aimed to explore how school heads' leadership quality, organizational climate, and learning environment affect teachers' innovativeness. It used descriptive-correlationaland causal research design. It assessed teachers' perceptions on leadership quality, organizational climate, and learning environment . employing ANOVA to identify differences in innovativeness across various demographics. Correlational analysis and regression were used to assess relationships and impacts of the independent variables on teachers' innovativeness.

2.2 Research Participants

The study was conducted in the district of Lagonglong, Misamis Oriental Division, the district is comprised of six school principals, five head teachers, and two schools in charge, covering 13 public schools. Proportionate stratified random sampling was used in determining teacher-respondents. The study involved 167 public school teachers. Using proportionate stratified random sampling method, where proportionate random samples were taken according to population size per school relative to a total population was adopted.

2.3 Research Instrument

The questionnaire developed by the researchers was divided into four sections. Part I aimed to gather important background information about the teacher respondents. This section helped to understand the demographics and characteristics of the sample, which were useful for data analysis and identifying any potential demographic factors that influenced the research results. Part II is a self-created questionnaire that assessed teachers' perceptions of school administrators' leadership. It focused on gathering data about how teachers perceive the leadership quality of school administrators. Part III is a self-created questionnaire on organizational climate. The questions explored the teachers' perceptions of the overall atmosphere within the school, including relationships, communications, and collaboration. Part IV is another self-made questionnaire. This one assessed the learning environment's conduciveness to innovation. Questions included were about resource availability, safety and well-being, and instructional strategy. Part V teachers' innovativeness utilized a self-made questionnaire designed to measure the level of innovativeness exhibited by teachers themselves. It assessed their innovative practices, creative teaching methods, and the extent to which they apply new ideas or techniques in their teaching. Questions in this section focused on technology integration, adaptability, and creativity in the classroom.

The questionnaire's validation process involved expert review and evaluation by qualified validators to ensure its accuracy. Three validators were selected based on their extensive experience and expertise in relevant fields such as psychology, counseling, and education. Through expert review, the questionnaire's content validity was assessed to ensure that it comprehensively covered all relevant aspects of the constructs being measured. Additionally, factor analysis examined construct validity to confirm alignment with theoretical constructs. The

researchers tested for reliability to see if these instruments could accurately measure what they were intended for. The reliability test was done to gauge whether the questionnaire was reliable, and it found that its internal consistency and test-retest reliabilities were acceptable. To measure the internal consistency of the items on the questionnaires, Cronbach's Alpha Reliability Coefficient was employed.

2.4 Data Analysis

For problems 1, 2, 3, 4, and 5, descriptive statistics such as frequency, mean, and standard deviation were employed to determine the level of innovativeness exhibited by teachers. ANOVA was utilized to determine whether there was a significant difference in teachers' innovativeness based on differences in respondents' demographic profiles. Pearson product correlation was employed to determine whether there was a significant relationship between the leadership qualities of school heads, organizational climate, learning environment, and the innovativeness of the teachers. Correlation analysis was used to determine the strength and direction of the relationship between these two variables. Moreover, multiple regression analysis was used to examine the combined effect of several independent variables on a dependent variable—in this case, teachers' innovativeness.

2.5 Ethical Considerations

Ethical considerations, carried out by this study, were very strict to ensure that the rights and welfare of the respondents are protected. All participants gave informed consent, thereby ensuring openness about the purpose of the research. Participants were assured that becoming part of this investigation was completely voluntary. They had the right not to participate or drop out at any time without influencing anything in the research. All study-related information was kept secret within the limits of the law. Information was maintained securely, with only the researchers having access to it. The participants maintained the strictest confidentiality, as no names were used in any research publications or presentations.

3.0 Results and Discussion

3.1 Demographic Profile

Table 1 presents the distribution of respondents based on their age, sex, rank, highest educational attainment, and years of service.

Table 1. Descriptive statistics of the demographic profile of the respondents

Age (in years)	Frequency	Percentage (%)
21-25	7	4.2
26-30	24	14.4
31-35	35	21.0
36-40	29	17.4
41-45	29	17.4
46-50	17	10.2
51-above	26	15.6
Sex		
Male	52	31.1
Female	115	68.9
Rank		
Teacher I	74	44.3
Teacher II	28	16.8
Teacher III	52	31.1
Master Teacher	13	7.8
Educational Attainment		
College Graduate	56	33.5
Postgraduate	111	66.5
Years of Service		
1-5	25	15.0
6-10	47	28.1
11-15	52	31.1
16-20	17	10.2
21-above	26	15.6

Table 1 shows that 21.0% of respondents were aged 31-35, 17.4% are 36-40, another 17.4% were 41-45, 14.4% were 26-30, and 15.6% were 51 and older. A large proportion of the sample belonged between 30 and 40 years old. Research highlights the importance of age in teaching efficiency and professional development (Afzal et al., 2023).

Younger teachers tend to use technology more effectively and adopt innovative instructional approaches (Haleem et al., 2022). For the sex distribution, 68.9% of participants were female and 31.1% were male, highlighting a gender disparity in teaching roles. Teaching is traditionally viewed as a nurturing profession, leading to more women in the field. This trend is reinforced by societal norms and lower salaries, making it challenging to attract more male teachers. Studies, like those by ElAtia et al. (2022) and Stewart et al. (2021), confirm women dominate education and face specific career challenges. Research also indicates that male and female teachers bring different perspectives and teaching styles, affecting classroom dynamics and outcomes (Tarrayo et al., 2021). The distribution of teaching ranks among participants: 44.3% were Teacher I, 31.1% were Teacher III, 16.8% were Teacher II, and 7.8% were Master Teacher. This indicated a varied composition of teaching ranks within the sample. Most teachers were in the Teacher I position, often fresh graduates facing challenges like classroom management and curriculum development. Research emphasized the importance of supporting early-career teachers to enhance job satisfaction and retention. Studies by Johler et al., (2022) and Hulme & Wood (2022) highlight the significance of tailored support systems for novice teachers. The Table also shows that 33.5% of participants were college graduates, and 66.5% held postgraduate degrees. This indicated a highly educated group. Teachers with postgraduate degrees tend to have better teaching skills and positive learning outcomes. Research supports that higher education levels lead to greater teaching effectiveness and professional development (Malanchini et al., 2020; Ventista & Brown, 2023). Among the respondents, 31.1% have served for 11-15 years, 28.1% for 6-10 years, 15.0% for less than five years, 10.2% for 16-20 years, and 15.6% for over 21 years. This distribution highlighted a mix of early-career, mid-career, and experienced teachers. Research indicated that teachers at different career stages have varying views, abilities, and interactions. Experienced teachers often have better teaching and classroom management skills, positively affecting student engagement and performance (Hayak & Avidov-Ungar, 2020; Cents-Boonstra et al., 2020). Studies also show that long-serving teachers might experience job dissatisfaction and poor work-life balance. Additionally, there is a correlation between length of service and factors like burnout, turnover intentions, and organizational commitment (Hoque et al., 2023).

3.2 Level of Leadership Quality of the School Administrators

Table 2 shows teachers perceived visioning ability, team-building skills, supportive nature, and innovativeness as indicators of administrators' quality leadership.

Table 2. Descriptive statistics of the level of leadership quality of the school administrators as perceived by teachers

Components	Mean	SD	Interpretation
Vision	3.53	0.50	Outstanding
Team Building	3.52	0.51	Outstanding
Support	3.51	0.53	Outstanding
Innovation	3.54	0.51	Outstanding
Total Measure	**3.53**	**0.47**	**Outstanding**

Table 2 shows high mean scores (3.51 to 3.54) with low standard deviations, indicating strong consensus among teachers. "Innovation" scored highest at 3.54, while "Support" rated lowest at 3.51 but still "Outstanding." These results highlighted effective leadership across various dimensions like vision, teamwork, support services, and innovation. Research confirms that visionary, inclusive leadership, along with support for innovation, enhances teacher motivation and student outcomes. Effective leaders foster collaboration, provide professional development, and encourage creativity, creating a positive environment for better educational results. It has been concluded that creative practices by school principals can enhance teacher creativity, improve instruction quality, and increase student motivation, consequently improving their performance at school (O'Shea, 2021). Furthermore, innovatively inclined instructors use technology in conjunction with data-driven decision-making to ensure constant improvement and adaptation in teaching settings (Schmidt, 2023).

3.3 School's Organizational Climate

Table 3 provides a consolidated overview of teachers' perceptions of the school's organizational climate, encompassing the components of relationships, communication, and collaboration. Table 3 shows consistently high mean scores (3.45 to 3.54) across components, indicating strong agreement on the positive organizational climate in the school. "Relationships" received the highest mean score at 3.54, reflecting strong camaraderie among colleagues. "Communication" had the lowest mean at 3.45 but was still rated as "Outstanding" for effective information sharing.

Table 3. Descriptive statistics of the school's organizational climate as perceived by teachers

Components	Mean	SD	Interpretation
Relationship	3.54	0.50	Outstanding
Communication	3.45	0.56	Outstanding
Collaboration	3.51	0.50	Outstanding
Total Measure	**3.50**	**0.48**	**Outstanding**

These findings underscored the importance of a positive school climate, promoting teacher satisfaction and collaboration through effective leadership practices, ongoing professional development, and team-building activities. Fostering supportive relationships, transparent communication, and collaboration are essential for creating a positive organizational climate, benefiting both teachers and students. Importantly, these findings demonstrated the need to prioritize a holistic approach toward organizational climate in school leadership and management practices. School leaders can foster a positive organizational climate by building supportive relationships, creating transparent communication, and facilitating collaboration among staff members (Cooray, 2023). Investing in leadership development programs and training initiatives that focus on relational, communicative, and collaborative skills could further boost the overall school climate, thereby increasing teacher satisfaction and student success (Tingle et al., 2017).

3.4 School's Learning Environment

Table 4 shows school's learning environment as perceived by teachers.

Table 4. Descriptive statistics of the school's learning environment as perceived by teachers

Components	Mean	SD	Interpretation
Resource Availability	3.35	0.55	Very Satisfactory
Safety and Well-being	3.47	0.55	Very Satisfactory
Instructional Strategy	3.53	0.53	Very Satisfactory
Total Measure	**3.45**	**0.48**	**Very Satisfactory**

Tabble 4 shows consistently high mean scores ranging from 3.35 to 3.53, with an overall average of 3.45 and standard deviations between .48 and .55, indicating strong agreement among teachers about the positive learning environment in the school "Instructional Strategy" received the highest mean score at 3.53, indicating high satisfaction, while "Resource Availability" had the lowest mean at 3.35, still rated as "Very Satisfactory." Teachers reported positive experiences with resource availability, safety measures, and instructional strategies, emphasizing the importance of a holistic approach to the learning environment. Positive perceptions of the environment are crucial for teacher morale, teaching effectiveness, and student engagement. A positive learning environment fosters motivation, student success, and feelings of belongingness among teachers and students. Rusticus et al.'s (2023) findings highlighted the significance of an affirmative learning space in school leadership and management approaches. Based on teachers' opinions, principals may solve some problems related to resource allocation, self-preservationist guidelines, and instructional support (Yang et al., 2021).

3.5 Level of Innovativeness

Table 5 provides an overview of teachers' innovativeness based on various factors such as technology integration, adaptability, and creativity.

Table 5. Descriptive statistics of the level of innovativeness exhibited by teachers

Components	Mean	SD	Interpretation
Technology Integration	3.52	0.37	Highly Innovative
Adaptability	3.61	0.39	Highly Innovative
Creativity	3.62	0.38	Highly Innovative
Total Measure	**3.59**	**0.32**	**Highly Innovative**

Table 5 reveals a high level of teacher innovation across various dimensions, with an overall average score of 3.59. Teachers exhibit significant innovativeness in areas like technology integration, adaptability, and creativity, as reflected in mean scores ranging from 3.52 to 3.62. These findings emphasize the importance of nurturing teacher innovation, which significantly impacts successful learning dynamics. Supportive school leadership and a positive organizational climate are crucial in fostering teacher innovation, with professional development programs focusing on enhancing teachers' capacity for technology integration, adaptability, and creativity. Innovative teachers demonstrate flexibility, seek growth opportunities, and view obstacles as chances for innovation.

Creativity in teaching involves designing compelling learning experiences that foster creative thinking among students and enhance their problem-solving capabilities. This underscored the importance of supporting and providing resources for teachers to enhance their innovativeness across different dimensions (Barcelona et al., 2023). As such, professional development programs should focus on building teachers' capacity for technology integration, adaptability, and creativity. School leaders play a critical role in creating a supportive environment that values and rewards innovative practices (Westgate & Noble, 2019).

3.6 Test of Difference in Teachers' Innovativeness and Profile

Table 6 presents the results of a test of difference in teachers' innovativeness based on their sex, examining three dimensions: technology integration, adaptability, and creativity, along with a total measure.

Table 6. Analysis for the difference in teachers' innovativeness when grouped to their sex

Teachers' Innovativeness[1]	Sex group		t-value (p-value)[2]	Remarks
	Male (n=52)	Female (n=115)		
Technology Integration	3.51 (.37)	3.53 (.37)	-.306 (.760)	Not significant
Adaptability	3.58 (.41)	3.63 (.38)	-.838 (.403)	Not significant
Creativity	3.57 (.43)	3.64 (.36)	-1.083(.281)	Not significant
Total Measure	3.55 (.35)	3.60 (.31)	-.882 (.379)	Not significant

Note: [1]based on Mean (SD), [2]based on Independent Two-sample T-test, Not significant (p>.05)

Table 6 presents data showing no significant differences in innovativeness between male and female teachers across various dimensions. For instance, in technology integration, men scored 3.51 (SD=0.37) and women 3.53 (SD=0.37), with a non-significant t-value of -0.306 (p=0.760). These findings suggest that a gender-neutral approach to supporting teacher innovation is crucial for fostering an inclusive and collaborative environment. Wrigley-Asante et al. (2023) discussed the importance of gender inclusivity in professional development initiatives, emphasizing equal opportunity and fairness. Conversely, Lord et al. (2020) suggest subtle, non-significant gender-based differences that warrant further investigation. While some studies show gender-based creativity gaps (Huang et al., 2022), recent research, including Alnahdi & Schwab (2023) and Copur-Gencturk et al. (2023), indicate no significant distinctions, underscoring the need to move beyond traditional gender divisions.

Table 7 shows the test of difference in teachers' innovativeness when grouped to their age.

Table 7. Analysis for the difference in teachers' innovativeness when grouped to their age

Teachers' Innovativeness[1]	Age group						F (p-value)[2]	Remarks
	21-30 (n=31)	31-35 (n=35)	36-40 (n=29)	41-45 (n=29)	46-50 (n=17)	51+ (n=26)		
Technology Integration	3.66^{b} (.35)	3.50^{ab} (.30)	3.41^{a} (.35)	3.65^{b} (.28)	3.51^{ab} (.55)	3.39^{a} (.37)	2.995*(.014)	Significant
Adaptability	3.46^{a} (.34)	3.54^{ab} (.38)	3.66^{abc}(.37)	3.79^{c} (.28)	3.51^{ab} (.54)	3.72^{bc}(.39)	3.316**(.007)	Significant
Creativity	3.52 (.36)	3.63 (.29)	3.59 (.42)	3.68 (.38)	3.53 (.47)	3.72 (.39)	1.231 (.297)	Not significant
Total Measure	3.55 (.27)	3.56 (.24)	3.56 (.34)	3.71 (.28)	3.51 (.51)	3.61 (.34)	1.213 (.306)	Not significant

Note: [1]based on Mean (SD), [2]based on One-way ANOVA test, Not significant (p>.05), *significant (p<.05), **significant (p<.01), abc-based on Duncan test

According to Table 7, the results of a one-way ANOVA showed that technology integration (F=2.995, p=0.014) and adaptability (F=3.316, p=0.007) significantly varied across age groups. Duncan's test revealed age-related differences in technology integration and adaptability among teachers, with younger teachers excelling in technology integration and older teachers showing higher adaptability. However, no significant differences were found in creativity across age groups. Tailored professional development strategies based on age could enhance technology integration and adaptability skills. Recent research suggests ongoing professional development can improve competencies across all age groups. Younger teachers are more open to experimenting with innovative methods, while older teachers adjust their approaches based on learner needs. Age does not significantly impact teachers' creativity levels, suggesting diversity-oriented creativity programs can benefit teachers at all career stages.

Table 8 shows the results of the test on the differences in innovativeness levels among instructors of different ranks.

Table 8. Analysis for the difference in teachers' innovativeness when grouped to their rank

Teachers' Innovativeness[1]	Rank group				F (p-value)[2]	Remarks
	T1 (n=74)	TII (n=28)	TIII (n=52)	MT (n=13)		
Technology Integration	3.56 (.33)	3.54 (.44)	3.45 (.39)	3.57 (.33)	1.079 (.360)	Not significant
Adaptability	3.59 (.38)	3.57 (.43)	3.61 (.40)	3.85 (.17)	1.752 (.158)	Not significant
Creativity	3.62[a](.35)	3.57[a] (.43)	3.57[a] (.42)	3.91[b] (.16)	3.024* (.031)	Significant
Total Measure	3.59 (.28)	3.56 (.39)	3.54 (.36)	3.77 (.20)	1.907 (.131)	Not significant

Note: [1]based on Mean (SD), [2]based on One-way ANOVA test, Not significant (p>.05), *significant (p<.05)
ab-based on Duncan test

The result in Table 8 indicates higher creativity levels among Master Teachers compared to other ranks, but no significant differences in technology integration or adaptability were observed. Master Teachers may possess unique skills acquired over their careers, enabling them to innovate more in instructional practices. Further research could explore how rank influences teachers' adaptability and inform professional development initiatives for fostering adaptive teaching practices across all ranks.

Table 9 presents the results of a test showing differences in teachers' innovativeness based on their educational attainment.

Table 9. Analysis for the difference in teachers' innovativeness when grouped to their educational attainment

Teachers' Innovativeness[1]	Educational Attainment group		t-value (p-value)[2]	Remarks
	College Graduate (n=56)	Postgraduate (n=111)		
Technology Integration	3.55 (.34)	3.51 (.38)	.544 (.587)	Not significant
Adaptability	3.62 (.34)	3.61 (.41)	.082 (.935)	Not significant
Creativity	3.64 (.33)	3.61 (.41)	.486 (.628)	Not significant
Total Measure	3.60 (.26)	3.58 (.35)	.461 (.646)	Not significant

Note: [1]based on Mean (SD), [2]based on Independent Two-sample T-test, Not significant (p>.05)

The study found no significant differences in teachers' innovativeness between college graduates and postgraduates, suggesting that educational attainment does not impact teachers' ability to integrate technology, adapt, or be creative in teaching. This implies that tailored professional development programs can be beneficial for all teachers, regardless of their educational background. Recent studies support these findings, indicating comparable abilities and willingness to use technology and similar levels of creativity among teachers with different academic qualifications.

Table 10 presents the results of a test comparing teacher innovativeness using years of service as a criterion.

Table 10. Analysis for the difference in teachers' innovativeness when grouped to their years of service

Teachers' Innovativeness[1]	Years of Service group					F (p-value)[2]	Remarks
	1-5 (n=25)	6-10 (n=47)	11-15 (n=52)	16-20 (n=17)	21+ (n=26)		
Technology Integration	3.65 (.37)	3.54 (.34)	3.51 (.34)	3.52 (.41)	3.42 (.44)	1.334 (.260)	Not significant
Adaptability	3.73[b](.34)	3.44[a] (.34)	3.67[b] (.36)	3.65[b] (.46)	3.68[b] (.46)	3.539** (.008)	Significant
Creativity	3.71 (.29)	3.52 (.38)	3.61 (.37)	3.64 (.46)	3.71(.42)	1.564 (.186)	Not significant
Total Measure	3.70 (.25)	3.50 (.28)	3.60 (.30)	3.60 (.41)	3.60(.42)	1.613 (.174)	Not significant

Note: [1]based on Mean (SD), [2]based on One-way ANOVA test, Not significant (p>.05), **significant (p<.01), ab-based on Duncan test

Table 10 highlights a significant difference in adaptability among teachers with varying years of service, particularly between those with 6-10 years and 11-15 years. However, no significant differences were observed in technology integration, creativity, or overall innovativeness based on years of service. This suggests the need for targeted professional development programs to enhance adaptability skills, especially for mid-career teachers. Despite variations in adaptability, technology integration, creativity, and overall innovativeness remained

consistent across different lengths of service, indicating similar competencies among teachers regardless of experience

3.7 Relationship Between Variables

Table 11 presents the correlation results examining the relationship between school heads' leadership quality and teachers' innovativeness across dimensions, including technology integration, adaptability, creativity, and the total measure.

Table 11. Analysis for the relationship between the school heads' leadership quality and teachers' innovativeness

School Heads' Leadership	Teachers' Innovativeness							
	Technology Integration		Adaptability		Creativity		Total Measure	
	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks
Vision	.137(.078)	NS	.435*** (.000)	S	.327*** (.000)	S	.356*** (.000)	S
Team Building	.174* (.024)	S	.461*** (.000)	S	.414*** (.000)	S	.415*** (.000)	S
Support	.174* (.025)	S	.365*** (.000)	S	.266** (.001)	S	.318*** (.000)	S
Innovation	.191* (.013)	S	.428*** (.000)	S	.339*** (.000)	S	.379*** (.000)	S
Total Measure	.185* (.017)	S	.461*** (.000)	S	.368*** (.000)	S	.402*** (.000)	S

Note: [1]based on Pearson Correlation Analysis, ***significant at .001 level, **significant at 0.01 level, *significant at .05 level

Table 11 shows strong correlations between leadership qualities and teachers' innovativeness. Visionary school heads and team-building efforts by administrators positively influence adaptability, creativity, and overall innovativeness. Supportive school leaders foster innovation in technology integration and creativity.Creating an innovative environment also correlates positively with teacher innovativeness. These findings stress the crucial role of school leadership in fostering an environment conducive to teacher innovation, advocating for investment in leadership development programs for sustained educational improvement. Smith et al. (2020) and Johnson's (2021) studies also established that it is important for leaders in educational institutions to have a clear vision to appreciate different levels of adaptation, such as technological assimilation. Various forms of creativity and other types of teachers' overall innovativeness should also be appreciated. Thus, it illustrates how strategic direction provided by school leaders can shape innovative practices among classroom practitioners.

Table 12 presents the correlation results examining the relationship between school organizational climate and teachers' innovativeness across dimensions, including technology integration, adaptability, creativity, and the total measure.

Table 12. Analysis for the relationship between the school organizational climate and teachers' innovativeness

School Organizational Climate	Teachers' Innovativeness							
	Technology Integration		Adaptability		Creativity		Total Measure	
	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks
Relationship	.153* (.048)	S	.397*** (.000)	S	.342*** (.000)	S	.353*** (.000)	S
Communication	.324*** (.000)	S	.374*** (.000)	S	.406*** (.000)	S	.435*** (.000)	S
Collaboration	.277*** (.000)	S	.391*** (.000)	S	.417*** (.000)	S	.428*** (.000)	S
Total Measure	.275*** (.000)	S	.418*** (.000)	S	.420*** (.000)	S	.439*** (.000)	S

*Note: [1]based on Pearson Correlation Analysis, ***significant at .001 level, **significant at 0.01 level, *significant at .05 level*

Table 12 reveals significant correlations between school climate and teacher innovativeness. Positive relationships exist between factors like relationships, communication, and collaboration within the school and teachers' technology integration, adaptability, creativity, and overall innovativeness. Smith et al. (2021) emphasized the

importance of supportive relationships, while Salamandra (2021) highlighted the role of effective communication in enhancing teacher innovation.

Table 13 presents the correlation results exploring the relationship between the school learning environment and teachers' innovativeness across dimensions, including technology integration, adaptability, creativity, and the total measure.

Table 13. Analysis for the relationship between the school learning environment and teachers' innovativeness

School Learning Environment	Teachers' Innovativeness							
	Technology Integration		Adaptability		Creativity		Total Measure	
	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks	r-value[1] (p-value)	Remarks
Resource Availability	.161* (.038)	S	.292*** (.000)	S	.233** (.002)	S	.271*** (.000)	S
Safety and Well-being	.117 (.131)	NS	.276*** (.000)	S	.285*** (.000)	S	.268*** (.000)	S
Instructional Strategy	.172* (.026)	S	.328*** (.000)	S	.332*** (.000)	S	.329*** (.000)	S
Total Measure	.169* (.029)	S	.338*** (.000)	S	.319*** (.000)	S	.327*** (.000)	S

Note: [1]based on Pearson Correlation Analysis, ***significant at .001 level, **significant at 0.01 level, *significant at .05 level

The result in Table 13 highlighted significant positive correlations between aspects of the school learning environment and teachers' innovativeness. Resource availability correlates moderately with technology integration ($r=0.161$, $p=0.038$), adaptability ($r=0.292$, $p<0.001$), creativity ($r=0.233$, $p=0.002$), and overall innovativeness ($r=0.271$, $p<0.001$). Safety and well-being show significant correlations with adaptability ($r=0.276$, $p<0.001$), creativity ($r=0.285$, $p<0.001$), and overall innovativeness ($r=0.268$, $p<0.001$). Instructional strategy has strong positive relationships with technology integration ($r=0.172$, $p=0.026$), adaptability ($r=0.328$, $p<0.001$), creativity ($r=0.332$, $p<0.001$), and overall innovativeness ($r=0.329$, $p<0.001$). These findings suggest that a supportive school learning environment, encompassing adequate resources, safety, and varied instructional strategies, is essential for fostering teacher innovativeness. Administrators should prioritize these factors to create a conducive environment for innovative teaching practices.

The correlation matrix in table 14 reveals strong positive correlations among school heads' leadership quality, organizational climate, and learning environment variables.

Table 14. Correlation analysis between the school heads leadership quality, organizational climate and learning environment

Variables	Leadership Quality	Organizational Climate	Learning Environment
Leadership Quality	--		
Organizational Climate	.814*** (.000)	--	
Learning Environment	.766*** (.000)	.825*** (.000)	--

Note: Values expressed in r-value (p-value), ***significant at .001 level

Table 14 shows a strong correlation between leadership quality and both organizational climate ($r=0.814$, $p<.000$) and the learning environment ($r=0.766$, $p<.000$). This indicates that effective leadership fosters a positive organizational climate and conducive learning environment. Additionally, there is a strong link between organizational climate and learning environment ($r=0.825$, $p<.000$). Research by Converso et al. (2019) and Miller (2020) supported these findings, showing that transformational leadership and strong principal leadership significantly enhance trust, collaboration, and positive school climates. These findings highlight the critical role of school leaders in shaping educational outcomes, advocating for effective leadership strategies to improve both teacher and student performance. School heads' leadership quality, organizational climate, and learning environment as predictors of teachers' innovativeness

3.8 Multiple Regression Analysis

From Table 15, several significant predictors of teachers' innovativeness were obtained from multiple regression analysis.

Table 15. Multiple regression analysis

Predictor	Regression Coefficient (B)	S.E.	t-value	p-value	Remarks
(Constant)	2.528	0.178	14.167	<.001	Significant
Leadership Quality	0.121	0.086	1.404	0.162	Not significant
Organizational Climate	0.288	0.095	3.017**	0.003	Significant
Learning Environment	-0.109	0.086	-1.266	0.207	Not significant
Adjusted R^2 = 0.192 ANOVA for Regression: F=14.135***, p<.001					
Fitted Regression Model: Teacher Innovativeness = 2.528 + .288 * (Organizational Climate					

Note: **significant at .01 level

Table 15 indicates that organizational climate significantly predicts teacher innovativeness (p=0.003; t=3.017; B=0.288), underlining the importance of communication, relationships, and collaboration. However, leadership quality (B=0.121) and learning environment (B=-0.109) were not significant predictors. The adjusted R-squared value of 0.192 suggests that the predictors collectively explain about 19% of the variance in teacher innovativeness. ANOVA results (F=14.135, p<0.001) confirm the overall significance of the model, indicating that organizational climate, leadership quality, and learning environment jointly influence teacher innovativeness. Support from Kolleck et al. (2021) and Rusticus et al. (2023) reinforces these findings, emphasizing the connection between positive organizational climates and teacher engagement, satisfaction, and school effectiveness. While leadership quality and learning environment are important, their specific traits in this study did not directly influence innovativeness, indicating the need for further research.

4.0 Conclusion

This study revealed that quality leadership, a positive organizational climate, and a supportive learning environment significantly enhance teachers' ability to innovate. Key factors are effective communication, visionary leadership, and adequate support, which enhance job satisfaction, collaboration, and innovative teaching. School leaders are suggested to enhance communication, establish clear goals, and promote team building activities. These techniques cultivate collaborative decision-making, career advancement, and flexibility among teachers, resulting in enhanced teaching strategies and enhanced the use of technology. The study also underscored the essence of shared decision-making in formulating instructional programs tailored to students' needs, urging teachers to collaboratively engage in curriculum development. Future researchers, it would be interesting to explore more about the specific mechanisms that connect an organizational climate to teacher's innovativeness to gain a deeper understanding and provide for appropriate interventions. Moreover, the findings validated James MacGregor Burns' Theory of Transformational Leadership within the context of enhancing teacher innovativeness. The study confirmed that transformational leadership components—such as effective communication, visionary leadership, team building and adequate support—are instrumental in creating a positive organizational climate and supportive learning environment. These elements foster innovative teaching practices, thereby proving the theoretical framework's applicability and relevance in promoting teacher innovativeness. The study's results demonstrated the influential impact of quality leadership, organizational climate, and learning environment on teacher innovativeness in school settings. Effective communication, and team building were the main contributing factors to enhance innovative teaching. Schools have to develop team-building activities, communication strategies, a common vision, and meaningful support to inspire and guide teachers in creating an environment conducive to innovative learning. Future researchers may explore examining specific mechanisms through which organizational climate influences teacher innovativeness to inform targeted interventions for educators and administrators alike.

5.0 Contributions of Authors

Every authors delivered equal contributions to the writing which includes conception, design, analysis, revision and collectively reviewed and approved the final manuscript.

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7.0 Conflict of Interests

The authors declare no conflicts of interest concerning the publication of this paper.

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