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Mediating Effects of School Climate on the Link Between Leadership Self-Efficacy and Student Performance in Public Secondary Schools in West Shewa Zone

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ABSTRACT

In recent years, trends indicate that student academic achievement particularly national examination results in secondary schools has faced significant challenges, prompting the need for multiple interventions. The study investigates the effect of school leaders' self-efficacy on student academic achievement, while exploring the mediating role of school climate. By analyzing how school leaders' confidence in their role provision shapes the school environment and ultimately contributing to boosting student academic achievement. The study employed quantitative survey design by applying AMOS version 23 and SPSS version 25 for data analysis with 235 determined using multistage sampling method. The finding of the study revealed that self-efficacy has a direct positive effect on student academic achievement (β = 0.07, p = .001), confirming Hypothesis H1. Leaders' self-efficacy also significantly influenced school climate (β = 0.38, p = .001), supporting Hypothesis H2. School climate itself was found to be a significant predictor of student academic achievement (β = 0.11, p = .001), thereby confirming Hypothesis H3. Mediation analysis further demonstrated that school climate partially mediates the relationship between self-efficacy and student achievement, with an indirect effect of β = 0.56, p = .001. Overall, the study underscores the critical role of school leaders' self-efficacy in shaping positive school climates and driving students to success. It highlights the importance of strengthening leadership capacities as a strategic approach to addressing the current persistent academic achievement decline in public secondary schools.

Keywords: School Leaders, School Climate, Self-Efficacy and Effect

INTRODUCTION

Self-efficacy, a cornerstone of Bandura's (1977, 1986) social cognitive theory, refers to an individual's belief in their capacity to execute tasks and achieve desired outcomes. Within educational leadership, self-efficacy is particularly vital, as it shapes school leaders' ability to navigate complex challenges, foster teacher development, and drive student success (McBrayer et al., 2020). This section examines the determinants, implications, and strategies for enhancing self-efficacy in school leaders.

Recent scholarship underscores the centrality of leadership self-efficacy in educational management. Mohammad et al. (2023), through a systematic review, identify professional development as a recurring theme, highlighting its role in strengthening leaders' confidence and effectiveness. Röhl et al. (2022) demonstrate that leaders with strong self-efficacy are better equipped to initiate and sustain innovations during times of crisis, reinforcing the need for leadership training and preparedness. Similarly, Arastaman et al. (2024) reveal that self-efficacy shapes both the motivation to assume leadership positions and the apprehensions associated with them, thereby influencing the decision to become a school principal. Complementing these findings, Pascual (2023) emphasizes that leaders' self-efficacy not only informs their leadership styles but also exerts a significant impact on teachers' self-efficacy and job satisfaction, underscoring the importance of continuous professional development initiatives.

Bandura (1977, 1986) contends that successful outcomes are determined not merely by behavior, but by an individual's belief in their own ability to perform effectively. While much of the leadership literature has traditionally emphasized observable behaviors associated with school success (Leithwood & Riehl, 2003; Marzano et al., 2005), the present study shifts focus toward examining how school leaders' confidence in their capacity to exercise effective leadership influences school outcomes (Tschannen et al., 2004, 2005). The principal sources of school leaders' self-efficacy are mastery experiences, vicarious experiences, and verbal persuasion. Mastery experiences successfully overcoming challenges strengthen leaders' confidence, enhance decision-making, and contribute to a positive school climate, which in turn supports student achievement (Chen, 2024). Vicarious experiences, such as observing effective leadership practices, inspire both staff and students by fostering a culture of achievement. Verbal persuasion, delivered through constructive feedback and encouragement, further reinforces leaders' confidence to implement transformational practices that actively engage teachers and learners (Sila et al., 2023).

The impact of self-efficacy on student academic achievement is manifested through mechanisms such as instructional leadership and the cultivation of a positive school climate. Empirical evidence indicates that leaders who uphold high expectations and actively engage teachers contribute significantly to improved student outcomes (Parveen et al., 2023). Principals' confidence in their instructional and managerial abilities is closely linked to their expectations for student success, which in turn directly shapes academic performance (Schrik & Wasonga, 2019). The development of validated instruments, such as the Leaders' Self-Efficacy Scale School, highlights the multidimensional nature of leadership self-efficacy and its critical role in advancing school improvement initiatives (Petridou et al., 2014). Ultimately, strengthening self-efficacy among

school leaders is essential for inspiring both teachers and students, thereby fostering enhanced academic achievement (Benawa, 2017).

The urgency of this research is underscored by alarming trends in the country at large in student academic achievement and with particular scope within the West Shewa Zone of the Oromia Regional State. Data from the past two academic years reveal a significant decline in performance on the national secondary school leaving examination. In 2014 E.C., 14,973 students sat for the exam, yet only 279 (1.86%) scored 50% and above. In 2015 E.C., the number of examinees increased to 16,046, but only 171 students (1.06%) achieved scores of 50% and above, underscoring a worsening achievement gap.

A closer look at the results highlights the severity of the problem. In 2014 E.C., only one student scored above 600 in the Natural Sciences or 500 in the Social Sciences. A total of 279 students achieved 50% and above, while 1,023 students reached the remedial pass mark, yielding a combined pass rate of 8.69%. By contrast, in 2015 E.C., no students surpassed the 600 (Natural Sciences) or 500 (Social Sciences) thresholds. Only 171 students scored 50% and above, resulting in a pass rate of 1.06%. Although 2,122 students achieved the remedial pass mark that year, raising the remedial pass rate to 13.22%, the overall pass rate stood at 14.29%, reflecting a decline in higher-level achievement compared to the previous year (West Shewa Education Office, 2023).

These findings illustrate the magnitude of the academic achievement crisis and highlight the need for research into leadership accountability as a potential contributing factor. Accordingly, this study seeks to examine school leaders' self-efficacy across selected dimensions of problem-solving capacity, task management capacity, and the ability to influence the school community toward achieving desired outcomes. It further explores the mediating role of school climate in shaping student achievement, particularly in the context of the persistent decline observed in Ethiopian secondary schools and, more specifically, within the West Shewa Zone over the past two academic years.

1.2 Objectives

The objective of this study is to examine the effect of school leaders' self-efficacy on student academic achievement, with particular attention to the mediating role of school climate, and to draw implications for addressing the current academic achievement crisis in the study area.

1.3 Research Question/Hypothesis

1. What is the effect of school leaders' self-efficacy on student academic achievement?
2 Does school leaders' self-efficacy significantly influence school climate?
3. Does school climate significantly influence student academic achievement?
4. What is the mediating effect of school climate between leaders' self-efficacy and student achievement?

1.3.1 Hypothesis

H1: Leaders' self-efficacy has a significant effect on student academic achievement.
H2: Leaders' self-efficacy significantly influences school climate.
H3: School climate significantly affects student academic achievement.
H4: School climate mediates the relationship between school leaders' self-efficacy and student academic achievement.

2. Theoretical Review

This framework examines the dynamic relationship among self-efficacy, school climate, and academic achievement, suggesting that a supportive school climate fosters students' self-efficacy, which subsequently promotes higher levels of academic success. Grounded in Bandura's Social Cognitive Theory, self-efficacy is defined as an individual's belief in their capacity to perform tasks and achieve desired outcomes. It plays a critical role in shaping goal setting, persistence, and motivation within educational contexts (Bandura, 1997).

School climate refers to the overall quality and character of school life, encompassing the nature of interactions among students, teachers, and the broader school environment. A positive climate is characterized by safety, support, and a sense of belonging, all of which encourage student engagement and effective learning (Thapa et al., 2013). Academic achievement commonly assessed through grades, standardized test scores, and overall performance, reflects the extent to which students can apply the knowledge and skills acquired through their education (Gottfried, 2010).

2.1 Conceptual Framework

The study conceptualized the construct between the school leaders' self-efficacy effect on the student academic achievement and the mediating role of school climate variables.

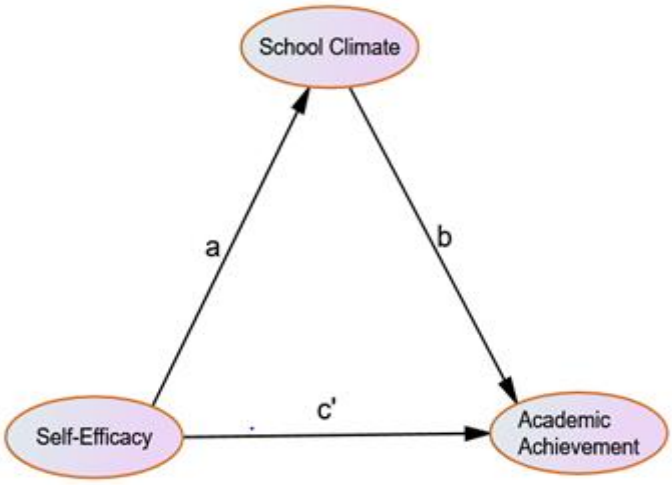

Figure 1: Conceptual Mediation Model for study

METHODOLOGY

3.1 Study Area

The study is intended to examine the school leaders' self - efficacy effect on enhancing student academic achievement the mediating roles of school climate in the Oromia region West Shewa zone public secondary schools. The area encompasses 23 administrative Districts, 85 public secondary schools and 2668 male and 433 with total of 3101 secondary school teachers (West Shewa Zone Education office, 2024).

3.2 Research Design

This study employed an explanatory quantitative design, which employed quantitative approaches to give a whole picture of the subject being studied, based on the conceptual framework that has been developed.

This method is appropriate for examining the strength and direction of relationships among variables and for testing mediation effects (Creswell & Creswell, 2018). Assuming the hypothesized direct and indirect pathways between school leaders' self-efficacy, school climate, and student academic achievement**,** the study employed structural equation modeling (SEM) as the primary analytical technique. SEM allows for the simultaneous estimation of multiple relationships among different variables in the construct, making it suitable for testing mediation models (Kline, 2023).

3.3 Sampling Techniques

This study targeted all secondary school teachers and leaders as the population. A multi-stage sampling technique was employed to determine the actual sample size. At the beginning, stratified sampling, a type of probability sampling was used to divide the study area into four administrative clusters (Creswell, 2014). From these clusters, systematic random sampling was applied to select four districts out of the 23 districts available in the zone (Kumar, 2019).

Next, all secondary school teachers within the schools located in the selected districts were considered as the sampling frame. Finally, using Cochran's finite population, sample size determination formula, a total of 240 secondary school teachers were determined to participate in the study. Accordingly, Cochran's Sample Size Formula with Finite Population Correction (N = 464) from four secondary school teachers.

Where Confidence level: Z=1.96Z = 1.96, Margin of error: e=0.05e = 0.05, Proportion: p=0.5, q=0.5p = 0.5, \ q = 0.5, Population: N=464

$$n = \frac{z^2 * p * q * N}{e^2 (N-1) + Z^2 * p * q} = \frac{(1.96^2) * (0.5) * (0.5) * 464}{(0.05)^2 (464-1) + (1.96)^2 * (0.5) * (0.5)} = \frac{445.1}{2.1179} = 210$$

Finally, to increase the chance of overcoming the nonresponse it's common in survey research to adjust for nonresponse due to different reason as indicated by World Bank, (2005). Therefore, the total sample size becomes 240 after applying 10-15% non-response adjustments.

3.4 Data Collection Instruments

The primary data for this study were collected using structured survey questionnaires, which served as the main data collection instrument (Creswell, 2014). The questionnaires were carefully designed

to align with the research objectives and included both closed-ended and a limited number of open-ended items. This combination allowed the researcher to capture not only quantifiable responses but also more detailed insights into the perceptions, experiences, and practical challenges in maintaining leaders' self-efficacy issues of secondary school leaders.

The closed-ended questions were primarily used to gather standardized data suitable for statistical analysis, while the open-ended items provided space for participants to elaborate on their views and add contextual depth to the findings. This mixed format supported both the breadth and depth of data collection (Creswell & Plano Clark, 2018).

The instrument was standardized and carefully adapted going through expert reviews taking account of their rating those from the related subject matter focusing on key variables identified in the research construct. Finally, items were measured using a Likert scale and confirmatory factor analysis was done to facilitate the validity and reliability of the instrument (Creswell & Poth, 2018).

3.5 Reliability and Validity

According to Kothari (2004), the reliability of a research instrument refers to its ability to produce consistent and stable results over repeated applications, while validity pertains to the extent to which an instrument accurately measures what it is intended to measure (Lewis, and Thornhill, 2019). Ensuring both validity and reliability will be essential for the credibility and integrity of the research findings.

To this end, a pilot study has been conducted prior to the main data collection phase. AMOS Software (Analysis of Moment Structures) has been used to estimate model parameters and assess model fit using appropriate indices. Additionally, a minimum sample size of 200 is generally recommended for structural equation model to ensure adequate statistical power been maintained. Linearity and the absence of multi co linearity among variables have been also assessed to validate the model requirements (Kline, 2016; Byrne, 2016).

Accordingly, the measurement model's reliability and validity were evaluated through confirmatory factor analysis (CFA). Reliability was assessed using Cronbach's (α), with values above 0.7 indicating consistency. Validity was checked for convergent and discriminant (AVE > 0.50, CR > 0.70) validity, ensuring constructs were distinct. In the case of the structural model, the analysis examined both direct and indirect effects of leaders' accountability on student academic achievement through school climate variables. It assesses the direct influence of school leaders' self-efficacy on academic achievement and school climate, as well as the mediating role of school climate between them, following the causal sequence: SE → SC → Acad. The indirect effect of SE on Acad through SC was tested using bootstrapping techniques in SEM-AMOS, which provide robust estimates without assuming normality. Model fit is evaluated using several indices, including chi-square, CMIN/df < 3, p-value > 0.05, GFI and Adjusted GFI > 0.95 and 0.90, SRMR < 0.05, RMSEA < 0.08, TLI and NFI > 0.90, and CFI > 0.95, confirming a good fit and supporting the study's findings (see detail model fit analysis from Table 6).

3.6 Measurement Review of the construct

Table 1: Review of Measurement Instrument

Item No	Construct to be Measured	Measurement Tools	Literature Support
1	Self-Efficacy	Leadership Self-Efficacy Scale	Bandura, A. (1977), Luthans, F., & Youssef, C. M. (2007), Newman, A., et al. (2018), U.S. Department of Education, first developed 2016 and officially launched in 2017
2	School climate	School Climate Survey (SCS)	Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013), Gregory, A., et al. (2010)
3	Student Academic Achievement	Standardized Test Score/National Exam Test, GPA	Hattie, J. (2009), Woolfolk, A. (2016)

RESULTS AND DISCUSSION

4.1 Questionnaire Response Rate

The target respondents were secondary school teachers from public secondary schools in West Shewa Zone. A total sample size of 240 was determined, and questionnaires were distributed accordingly. Out of these, 235 were returned fully completed, while incomplete questionnaires were excluded from analysis. This represents an overall response rate of 97.9%, which is considered excellent to proceed with data analysis. According to Mugenda (2003), a response rate of 70% or above is regarded as very good and sufficient to proceed with data analysis. The realized rate in this study therefore exceeded the recommended threshold, ensuring reliability of the findings.

4.2 Demographic Characteristics of Respondents

Table 2: Demographic Profile of Respondents

Demographic Profile	Category	Frequency	Percent
Gender	Male	199	84.7
	Female	36	15.3
	Total	235	100.0
Age	20-30	72	30.6
	31-40	95	40.4
	above 41	68	28.9
	Total	235	100.0
Experience	1-5	40	17.0
	6-10	68	28.9
	11-15	49	20.9
	16-20	44	18.7
	above 21	34	14.5
	Total	235	100.0

Level of Education	Diploma	13	5.5
	BA/B.Sc.	131	55.7
	MA/M.Sc.	91	38.7
	Total	235	100.0

Source: Survey Data Analysis, 2025

The demographic profile of respondents shows that as indicated by Table 2, the majority of them were male holding 84.7% and the female respondent's shares 15.7% of the total. Concerning age categorization, 30.6% of them fall between (20-30) age range, while 40.4% of them were among the age range of (31-40) and lastly 28.9% of the respondents are from 40 and above. In relation to educational holdings most of them hold BA/B.Sc. that is about 55.7% and about 38.7 % of them hold MA/M.Sc. degrees.

4.3 Descriptive Analysis

Table 3 :Descriptive Analysis

Main Variables	Sub- Dimensions	Items	Mean	Std. Deviation
SE	Problem solving (prso)	prso5	3.745	.042
	μ=3.736	prso4	3.745	.042
	σ=.042	prso3	3.715	.043
		prso2	3.745	.042
		prso1	3.728	.042
	Task management(tamgt)	tamgt5	3.634	.043
	μ=3.623	tamgt4	3.613	.044
	σ=.043	tamgt3	3.617	.043
		tamgt2	3.609	.044
		tamgt1	3.643	.043
	Influence over (infov)	infov5	3.591	.043
		infov4	3.587	.043
	μ=3.581	infov3	3.583	.043
	σ=.043	infov2	3.574	.043
		infov1	3.566	.043
	Academic press (ap)	ap5	3.711	.055
	μ=3.770	ap4	3.757	.056
	σ=.054	ap3	3.791	.053
		ap2	3.813	.055
		ap1	3.779	.055
SC	Collegial leadership (col)	col5	3.715	.053
		col4	3.698	.053
	μ=3.709	col3	3.711	.053
	σ=.052	col2	3.677	.054
		col1	3.745	.051
	Community engagement (Ce)	ce5	3.711	.041
		ce4	3.732	.041
	μ=3.721	ce3	3.728	.041

	σ=.041	ce2	3.732	.041
		ce1	3.706	.042
	Teachers professionalism(tp)	tp5	3.617	.054
	μ=3.638	tp4	3.613	.055
	σ=.055	tp3	3.706	.055
		tp2	3.651	.055
		tp1	3.604	.055
AA	Academic Achievement	Acad4	32.255	.644
	(acad) μ=32.74	Acad3	32.740	.679
	σ=.683	Acad2	31.740	.613
		Acad1	34.243	.796

μ=Mean, σ= standard Deviation

Source: Survey Data Analysis, 2025

Due to the conceptual and metric differences between perceptual indicators and performance outcomes, interceptions were interpreted independently. This allowed for construct-specific insights without imposing artificial scale equivalence (Abu-Bader & Jones, 2025). This is more elaborated by Field, A. (2013) that reveals assumption of independence in the different constructs of the study.

Accordingly, as presented by Table 3 the descriptive analysis provided that leaders' self-efficacy three basic dimensions as of problem solving with a mean value of (proso) (μ=3.745, σ=.042) and task management sub dimensions of self-efficacy scored (tamgt) (μ=3.623, σ=.043). Similarly, the third dimension of self-efficacy influence over (infov) scored (μ=3.581, σ=.043). Those sub dimensions show that the three sub dimensions collectively indicate the role of leaders' self-efficacy in improving adequate academic achievement. Concerning the school climate dimensions as of community engagement (ce) score shows (μ=3.721, σ=.043) and the Collegial leadership (col) scored **(**μ=3.709**,** σ=.052) while Teacher's professionalism (tp) scored (μ=3.638, σ=.055) and the last indicator that is Academic press (ap) reveals (μ=3.770, σ=.054). The overall results of school climate variables support how leaders' accountability frameworks able to significantly contribute to the student academic achievement enhancement by bridging the ecological gap between the independent and outcome variables. The outcome variable that is student academic achievement (Acad) scored mean and standard deviation of (μ=32.74, σ=.683) and the values should be considered to independently interpreted due to the conceptual and metric differences between perceptual indicators and performance outcomes, the intercepts were interpreted independently. This allowed for construct-specific insights without imposing artificial scale equivalence **(**Abu-Bader & Jones, 2025, Hoffman, L. 2013). The result directly reveals the current student academic achievement deficit that is the critical concerns of this particular study and to be seen from different angles accountability frameworks than relying on centralized and controlled assessment alone as if it solves lasting solution.

4.4 Measurement Model Analysis

Table 4: Reliability and Factor Loading Analysis

Main Variables in the construct	Factor Loading	Sub - Dimensions	Factor Loading	Items	Reliability
Self-Efficacy (SE)	.60	-->proso	.991	-->prso5	.991
			.999	-->prso4	
			.939	-->prso3	
			.990	-->prso2	
			.972	-->prso1	
	.71	-->tm	.923	-->tamgt5	.971
			.961	-->tamgt4	
			.934	-->tamgt3	
			.946	-->tamgt2	
			.899	-->tamgt1	
	.65	-->infov	.952	-->infov5	.991
			.963	-->infov4	
			.986	-->infov3	
			.995	-->infov2	
			.995	-->infov1	
School Climate(SC)	.50	-->ce	.980	-->ce5	.988
			.985	-->ce4	
			.999	-->ce3	
			.995	-->ce2	
			.975	-->ce1	
	.81	-->cl	.931	-->col5	.984
			.854	-->col4	
			.910	-->col3	
			.880	-->col2	
			.920	-->col1	
	.84	-->tp	.938	-->tp5	.992
			.978	-->tp4	
			.889	-->tp3	
			.958	-->tp2	
			.984	-->tp1	
	.72	-->ap	.945	-->ap5	.990
			.936	-->ap4	
			.929	-->ap3	
			.867	-->ap2	
			.909	-->ap1	
Academic achievement (AA)	.88	-->acad	.897	-->Acad4	.974
			.933	-->Acad3	
			.758	-->Acad2	
			.856	-->Acad1	

Source: Survey Data Analysis, 2025

As it was presented by (Table 4 and Figure 3) the measurement model analysis shows that the Leaders' self-efficacy (SE) Overall construct loading was provided .65, indicating convergence of the sub-dimensions on the latent variable. Furthermore, the results from Sub-dimensions indicated as problem solving (proso) loading .60, with item loadings ranging from (.93 to .99), within high reliability (.991) showing internal consistency. While task management (tamgnt) loading was .71, with items loading between .92 and .96 and reliability score of (.971) provided that strong values confirming that task management items consistently measure the sub-dimensions very adequately. The third dimensions, the ability to influence over (infov) scored loading of .65, with items loading that range from (.95–.99) and with strong reliability values of (.991), insuring strong internal consistency. This can be justified and interpreted as that leaders' level of self-efficacy is a robust construct, with all sub-dimensions strongly represented and items showing nearly strong reliability. This indicates that problem solving capacity, task management capacity, and the extent to influence over are valid and reliable indicators of leaders' self-efficacy.

From the school climate (SC) sub dimensions, community engagement (ce) loading .50, with items ranging (.97–.99). Reliability (.988) is very strong. Again, collegial leadership (cl): Loading .81, with items (.91–.93) and reliability score of (.984) that is strong enough while teachers' professionalism (tp) loading of .84, with items from (.93–.95) and with strong reliability (.992) values. The academic press (ap) shows loading of .72, with items loading range from (.90–.94) within strong reliability (.990) values. This suggests that the construct loading for school climate is modest within each sub-dimension demonstrates strong loadings and high reliability. This suggests the sub-dimensions are internally consistent and valid. The academic achievement (Acad) construct loading holds .88, indicating very strong representation of the construct similarly with dimensional (acad) loading .88, with items ranging (.75–.93) and reliability results of (.974) that are strongly reliable and valid across the construct represented.

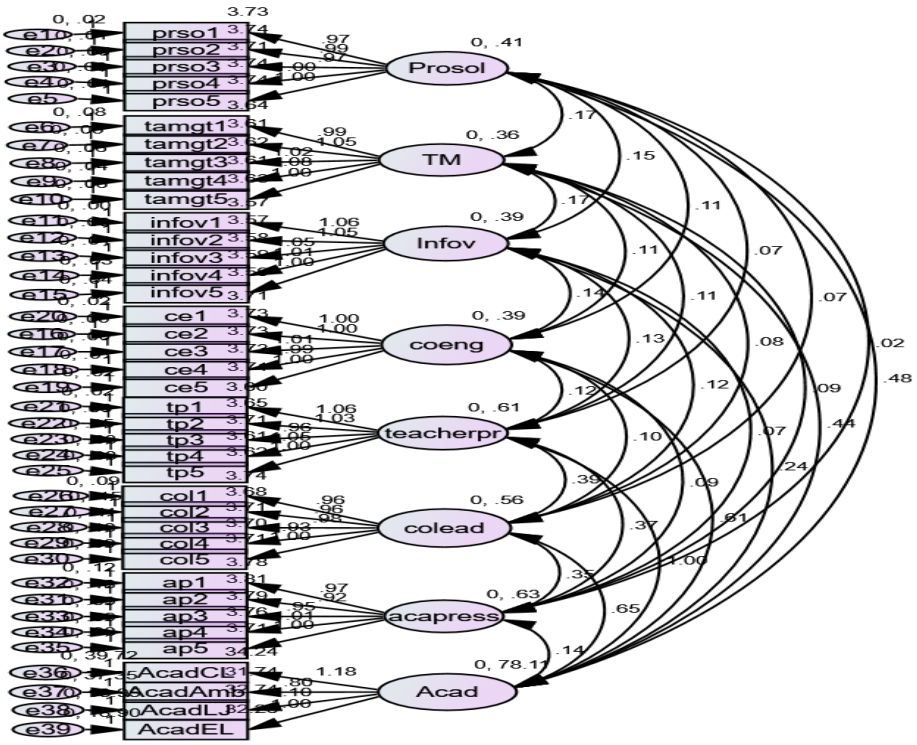

Figure 2: Factor loading Analysis AMOS Output, Source: Survey Data Analysis, 2025

Table 5: Validity Analysis of Dimensions in the Construct (Convergent and Discriminant validity)

Sub-Dimensions	Indicators loadings	**AVE**	**CR**	TP	CE	Infov	CL	AP	TM	Proso	Acad
TP	.889–.984	0.903	0.96	**0.950**							
CE	.975–.999	0.974	0.99	0.45	**0.987**						
Infov	.952–.995	0.957	0.98	0.38	0.42	**0.978**					
CL	.854–.931	0.809	0.93	0.39	0.41	0.42	**0.899**				
AP	.867–.945	0.842	0.95	0.40	0.43	0.41	0.44	**0.917**			
TM	.899–.961	0.870	0.95	0.41	0.40	0.43	0.42	0.44	**0.933**		
Proso	.939–.999	0.957	0.98	0.41	0.42	0.40	0.43	0.42	0.46	**0.978**	
Acad	.758–.933	0.746	0.91	0.36	0.40	0.36	0.41	0.43	0.42	0.47	**0.864**

Notes: Tresholds (AVE > 0.50, CR > 0.70) =Proso=Problem solving, TM=Task Management, Infov= Influence over,Tp=Teachers Professionalism, CE=Community Engagement, CL=Collegial leadership, AP=Academic Press, Acad=Academic Achievement

The results presented in Table 5 demonstrate that the validity analysis of the construct dimensions confirms strong reliability, convergent validity, and discriminant validity. Specifically, the convergent validity values are all above the threshold of 0.70, ranging from 0.91 (Academic Achievement) to 0.99 (CE), indicating robust internal consistency. Likewise, the AVE values surpass the minimum cutoff, thereby ensuring adequate convergent validity, with scores ranging from 0.746 (Academic Achievement) to 0.957 (Proso), showing that each construct is well represented by its indicators. Furthermore, discriminant validity is established, as the square root of each construct's AVE is greater than its correlations with other constructs (for example, TP √AVE of 0.950 exceeds its correlations with CE and Inflov). Overall, these findings confirm that the sub-dimensions are both reliable and distinct within the model.

4.5 Structural Model Analysis

The structural model analysis was performed to check the hypothesized relationships between the leaders' accountability, school climate and student academic achievement. To address this structural equation modeling using AMOS was used to assess the direct, indirect and total effects of the variables in the construct. Main aspects of the analysis include the path coefficients, significant levels and conduction model fit induces. Accordingly, the model fit statistics showed that as indicated by Table 6 assures strong model fits as it provides the Chi square/df ratio (CMIN/DF) is 1.779 which falls within acceptable range of between 1 and 3 suggesting an excellent fit. The comparative fit index (CFI) provided 0.969 exceeding the cutoff of 0.95 indicating the model adequately fits the data when compared to a null model. Similarly, the Tucker-Lewis Index (TLI) is 0.966 which falls below the acceptable thresholds of >0.95 providing that excellent fit indicating parsimony by avoiding over fitting by simplifying the model complexity. Moreover, the Root means square error of approximation (RMSEA) is observed 0.021 which is still acceptable thresholds that falls less than desired threshold of 0.06. The overall values indicated that the model exhibits the strong fit indices with possible room for improvement.

4.6 Mediation Analysis: Direct, Indirect and Total Effect Analysis

After preceding the measurement analysis, the structural model examined the significant relationship between the latent variables. Then the mediation analysis was performed to justify if school climate plays the mediating roles in linking the leaders accountability and student academic achievement as exhibited by (see Figure 3).

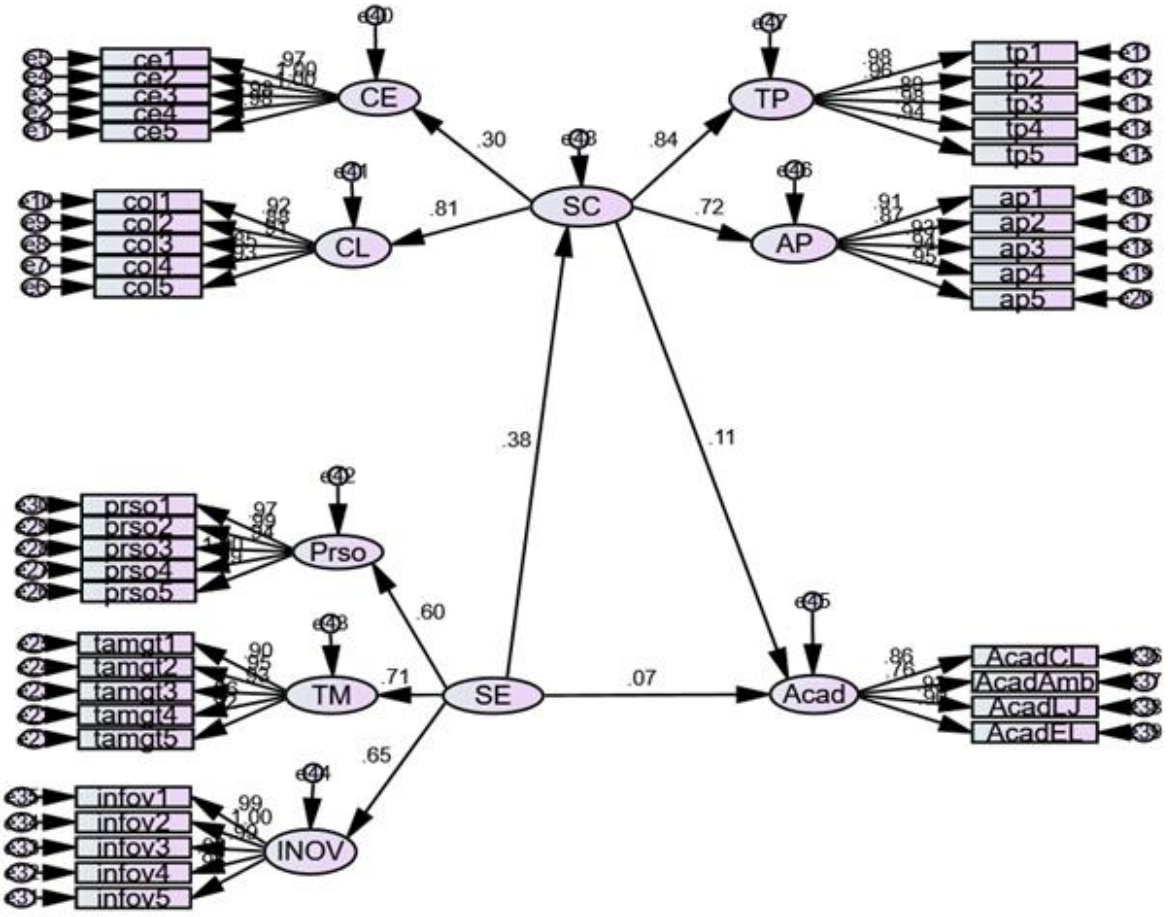

Figure 3: Mediation Model Diagram and Amos Results

Table 6: Model Fit Measures Analysis

Measures	Estimate	Threshold	Interpretation
CMIN/DF/(χ^2/df)	1.779	Between 1 and 3	Excellent
CFI	0.969	>0.95	Excellent
TLI	0.966	>0.95	Excellent
RMSEA	0.058	<0.06	Excellent

Source: Survey Data Analysis, 2025

As it was presented by the Table 6 the model fits taking account the most common model fit induces reveals that the Chi- (CMIN/DF) is 1.779 that falls within the acceptable range of 1 to 3 suggesting an excellent fit. The Comparative Fit Index (CFI) is 0.969, exceeding the cutoff criteria of 0.95, indicating that the model fits the data very well. Similarly, the Tucker-Lewis Index (TLI) is 0.966, within threshold, which reflects an excellent fit showing parsimony by avoiding over fitting by simplifying the complexity. Again, the Root Mean Square Error of Approximation (RMSEA) is 0.058, which provides still reasonable and exceeds the desired value of 0.06, indicating only an acceptable fit. Overall, the model exhibits a strong fit, but there is a bit of a chance for improvement.

Based on the cutoff criteria's by Hu and Bentler (1999) and Gaskin, J. & Lim, J. (2016), after insuring the reliability and validity through appropriate measurement model as shown by Table 6, the structural models hypothesized relationships were tested with the help of AMOS outputs through 2000 number of bootstrapping which is more recommended over sobel test by Preacher and Hayes (2004, 2008). The results demonstrated that the four hypothesized paths are significant and positive, confirming the theoretical framework predictive validity.

Table 7: Mediation Result and Hypothesis Testing

Description	Paths	Hypothesis	Effects	P- Values	Decision	Mediation type
Direct effect	SE-->Acad	H1	.07	***	Supported	Partial
	SE-->SC	H2	.38	***	Supported	
	SC-->Acad	H3	.11	***	Supported	
Indirect pass	SE-->SC-->Acad	H4	.56	***	Supported	
Total Effect	DE+IE		.63			

Source: survey Data, 2025, p=.001

4.6.1 Direct Effect of Leaders' SE on Student Academic Achievement (H1)

The analysis result indicated that SE has direct positive influences on the Acad within conveying the standardized coefficient of β= 0.07 with p-values of .001 since the p- values yields less than 0.05, Hypothesis H1 is confirmed, suggesting that leaders with high self-efficacy has the contribution in boosting the Acad achievement through the three dimensions as of problem solving ability, task management and capacity to influence. This is done by approaching being able to believe in own ability to make difference in intended school objectives, ensuring the ability of problem solving, task management and making influence on the school actors about the school performance specifically enhancing student outcomes.

4.6.2 Direct Effect of Leaders' SE on School Climates (H2)

The leaders SE positively influence the SC variables by the pass coefficient of β= 0.38 and .001 p-values, supporting the Hypothesis two H2. This result indicates that schools' leaders can play the lion share as it is their responsibility to shape the school environment as attractive as possible for better teaching and learning activities by taking part with local actors at which the school was hosted in.

4.6.3 Direct Effect of School Climate on Student Academic Achievement (H3)

The school climate variables are among the major contributors for the student academic performance. Based on this study, finding school climate effect on student academic achievement is significant as it yields path coefficient of β= 0.11 and .001 p- values. This supported the hypothesized effect between school climates and student academic achievement H3. This finding concurs with Robert J.et al. (2005). Again, the study by Alem Amsalu and Sintayehu Belay, (2024) revealed that, learning-teaching climate had significant direct positive effects on student academic achievement. Accordingly, the school climate in which the school is operating in is very determinants for one's school to perform well and ultimately enhances the student academic achievement as it is the major indicator for the school performance measures.

4.6.4 The Mediation Effect of School Climate in the Leaders SE and Academic Achievement Relationship (H4)

The mediation analysis of this study reveals that school climate partially mediates the relationship between leaders' self-efficacy and student academic achievement with indirect effect coefficient of β=0.56 and .001 p - values. This is importantly relocated partial bridge between leadership roles, behavioral issues and academic achievement by producing strong partial mediating roles between the two constructs.

4.6.5 The Total Effect

The total effect of β=.63 and .001 P values found that leaders SE plays important contributing traits through direct effect and as well as through the mediation roles by boosting school climate to get improved and ultimately contribute for enhanced school performance indicator that is student academic achievement. This is aligned with the findings of Schrik & Wasonga,2019) and Zysberg (2020) those revealed that principals' self-efficacy beliefs significantly influence student achievement as well as school climate and academic self-efficacy jointly contribute to student performance. This can be more clarified as the leaders' Self-efficacy supports the leaders beliefs in their potential to be exhausted not only for supervising the class room teaching quality directly but also responsible to improve the school climate variables in such away it can contribute for the better teaching and learning environment as it is directly and ultimately contribute for improved student academic achievement.

CONCLUSION

The findings of the study revealed that school leaders' self-efficacy (SE)**,** measured across three pillar dimensions belief in problem-solving ability, effective task management aligned with school objectives, and the capacity to influence the school community plays a significant role in enhancing student academic achievement. Accordingly, SE demonstrated a direct positive influence on student academic achievement, with a standardized coefficient of β = 0.07, p = .001**.** Since the p-value is below the threshold of 0.05, Hypothesis H1 is confirmed. This suggests that leaders with high self-efficacy contribute to improved academic achievement by making sound decisions and fostering confidence in their ability to achieve school objectives. This finding aligns with prior studies by Schrik & Wasonga (2019), who reported that principals' self-efficacy beliefs significantly impact student academic outcomes. SE also had a significant positive effect on school climate, with a path coefficient of β = 0.38, p = .001, supporting Hypothesis H2. This indicates that school leaders play a pivotal role in shaping an attractive and supportive environment for teaching and learning, often through collaboration with local stakeholders.

This result indicates that schools' leaders can play the lion share as it is their responsibility to shape the school environment as attractive as possible for better teaching and learning activities by taking part with local actors at which the school was hosted in. School climate itself was found to be a significant predictor of student academic achievement, with a coefficient of β = 0.11, p = .001, thereby confirming Hypothesis H3. This finding is consistent with Robert J. et al. (2005) and more recent evidence by Alem Amsalu & Sintayehu Belay (2024), who reported that a positive learning-teaching climate directly enhances student achievement. Accordingly, the school climate in which the school is operating in is very determinants for one's school to perform well and ultimately enhances the student academic achievement as it is the major indicator for the school performance

measures. Finally, mediation analysis revealed that school climate partially mediates the relationship between leaders' self-efficacy and student academic achievement. The indirect effect was $\beta = 0.56$, $p = .001$, indicating that school climate serves as a partial bridge between leadership roles, behavioral practices, and student outcomes. This underscores the importance of fostering a supportive climate as a mechanism through which leadership efficacy translates into improved academic performance.

CRediT Authors Contributions

Mulu Negasa Abebe: Development of concepts, methodological fixing, data collection, analysis, investigation and drafting the original manuscript.
Tadesse Regassa Mamo: Validation and playing supervisory role for the study milestones.

Conflicts of Interests

The researcher likes to declare that there is no significant conflict of interest in this academic article in funding and all other possible factors of conflicts.

Ethical Approval

The study was conducted going through maintaining all ethical standards and secured ethical clearance number 270 /2025 from Ambo University the IEBS ethical review committee.

Data Availability

The corresponding Author can avail all required data upon requests

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