

An Empirical Study on Instructional Leadership, School Climate and Teacher Efficacy

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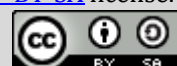
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ABSTRACT

The goal of this study is to evaluate how instructional leadership, teacher efficacy, and school climate influence students' academic performance. The study included 381 teachers from six divisions in Sarawak, Malaysia. This study used a cross-sectional survey approach. Questionnaires were used to collect data from respondents. For descriptive analysis, SPSS version 26.0 was utilised, while SmartPLS 3.0 was employed for partial least squares-structural equation modeling (PLS-SEM) analysis. By focusing on secondary school teachers, the paper adds new knowledge to literature. Surprisingly, the results of the investigation revealed that principals' instructional leadership and school climate had no substantial impact on student academic performance. Meanwhile, it was discovered that teacher efficacy has a considerable impact on student academic performance, implying that teacher efficacy is a predictor of student academic performance. Furthermore, teacher experience was not a significant moderator variable. Future research should focus on principals' self-assessment of instructional leadership and the moderating effect of school climate on student performance. The ramifications of the disparity between Asian instructional leadership and western literature should also be investigated.

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Introduction

Instructional leadership research has just lately gained traction in Asia, Africa, and Latin America [1,2]. There is widespread academic consensus, policy implementers, and policymakers that effective school leadership is critical to raising students' performance [3,4]. Recent worldwide empirical research [5,6] have identified instructional leadership as a leadership style that has been shown to promote school performance and student academic achievement. As a result, policymakers continue to place emphasis on conventional leadership practises and leadership development in order to achieve the highest possible student outcomes [7]. However, some studies over the last three decades have suggested that the link between instructional leadership and student academic performance is indirect, weak, or non-significant necessitating further research in this area in the current study.

In the twenty-first century, instructional leadership remains important and competitive, especially in the face of numerous leadership styles such as transformational leadership and distributed leadership. The Malaysian Ministry of Education (MoE) places a high value on school administrators' instructional leadership role in overseeing students' education from pre-school to secondary school [8]. As reported in the Malaysian Education Blueprint (2013-2025), instructional leadership improved students' performance by 20 per cent [9]. However, citations in the blueprint were from international literature, and more research has to be carried out in the local culture or context and school climate [10]. The findings show that instructional leadership has a different impact on student academic performance depending on the country [11]. Furthermore, few studies on the impact of instructional leadership on student performance have been conducted in Malaysia [12-14]. As a result, the current study was conducted to fill a research gap in Sarawak, Malaysia.

Education administrators should be held accountable for their students' academic success and overall performance. Additionally, principals must participate in instructional leadership activities at their schools because it is considered that these activities assist students in achieving academic performance [15]. On the other hand, principals cannot fully exercise instructional leadership characteristics since the theories and dimensions that underpin instructional leadership are separate. Besides, very few studies have investigated how principals manage curriculum and instruction. School principals play the role of instructional leaders by improving students' performance and supervising classroom teaching and learning process [16].

Other factors, however, have a significant effect in pupils' achievement. Previous studies have found a strong and significant link between instructional leadership and student achievement [17]; student performance and teacher efficacy [17]; teacher efficacy and student performance [18]; and student performance and school climate [19]. Over the last two decades,

experts have proposed that more research is needed to prove the link between teacher effectiveness and student learning results [20]. Furthermore, experienced teachers might be more effective in applying behavioural and classroom management approaches in their classrooms compared to novice teachers, and significant effects may thus be predicted [21]. However, no contemporaneous studies have been conducted including all four of these variables, and the current research was conducted to fill this gap in existing literature.

Researchers have also specified that findings from past studies have contradicted that instructional leadership significantly affects students' performance [15]. Also discovered by researchers was a scarcity of studies on the effect of instructional leadership by principals, teacher efficacy, and school climate on the academic performance of students in Malaysia, in particular the state of Sarawak, and in other countries. Furthermore, there has been a considerable difference in findings between teacher and principal assessments of the principle's instructional leadership abilities [22]. Therefore, this study used teacher samples to reflect on principals' instructional leadership.

Instructional leadership establishes the mission of a school by prioritising and emphasising students' academic achievement. Additionally, an instructional leader motivates, supervises, and monitors education in the school; enhances the school climate and promotes classroom instruction and student learning [23]. Following that, teacher efficacy can be defined as instructors' teacher of their capacity to affect student performance, which is related to their own performance, student behaviour, and student performance. Additionally, school climate refers to the psychosocial environment in which teachers perform their tasks and teach, as well as students' shared standards, values, and teachers' authority. Additionally, teacher experience is a binary or categorical variable that refers to teachers with less than three years of experience or with no experience at all. Finally, all national secondary schools in Malaysia are managed by principals who follow the Education Ministry of Malaysia's policies and a single standardised curriculum. Principals are required to complete a leadership and school management training programme called the National Professional Qualification for Educational Leaders, which is offered by Malaysia's Institute Aminuddin Baki [13](Ministry of Education, 2013).

As a result, the importance of this study is to justify principals' instructional leadership, teachers' efficacy, and how school climate influences students' academic performance so that principals and teachers in East Malaysia can receive systematic training, specifically in the state of Sarawak. This study also hopes to improve school climate to enhance the quality of students' learning environments, which is primarily an integral part of any school climate. Furthermore, to increase the quality of teachers, classroom instruction, and student learning, the teaching

profession necessitates knowledge and skill training and up skilling. A teacher's teaching practice based on their knowledge, skills, and actions greatly influence student learning, development and performance. Therefore, this study also evaluates teacher experience as a moderator.

Malaysian national religious schools [24] and rural national secondary schools have been reported to have a high level of instructional leadership [25]. According to studies, instructional leadership practises differ significantly amongst boarding schools, special model schools, Religious Schools, and Technical/Vocational Schools. Additionally, disparities in instructional leadership were discovered among Malaysia's regions [26]. Although instructional leadership was at a high level in Sarawak schools, there was no significant correlation between instructional leadership and student performance [17]. Additionally, instructors' efficacy was required in digital teaching and learning because it had an effect on students' performance in all schools under the Malaysian Ministry of Education [27]. Additionally, Ref. [28] hypothesised that school climate has a favourable effect on the performance of secondary school pupils in Perak, Malaysia.

The current study is guided by the following research questions: (i) Does instructional leadership have an effect on students' academic performance? (ii) Does teacher efficacy have an effect on student performance? (iii) Does school climate have an effect on student performance? Was teacher experience a moderator of the relationship between instructional leadership, teacher efficacy, and school climate? The current investigation was guided by the following hypotheses: H1: Instructional leadership has a considerable impact on students' academic performance; H2: Teacher efficacy has a substantial impact on students' academic performance; H3: School climate has a substantial impact on students' academic performance. H4: Teacher experience acts as a moderator in the relationship between instructional leadership, teacher efficacy, and school climate and students' academic performance.

Method

A. Research Design

This study employed a quantitative method and a cross-sectional design to collect data on the influence of study variables through the use of questionnaires. The researchers chose this strategy because it is effective at elucidating the relationship between variables, determining how these variables interact, and determining whether the factors are determinants of the expected outcome. Theory has a critical influence in determining the sort of study. The conceptual framework (theory) for this study was established in a systematic manner, taking into account all important constructs affecting students' academic performance. According to measurement theory, the literature study developed the necessary independent constructs to

explain and predict outcomes. As a result, this study necessitated a quantitative methodology in order to address all of the research issues.

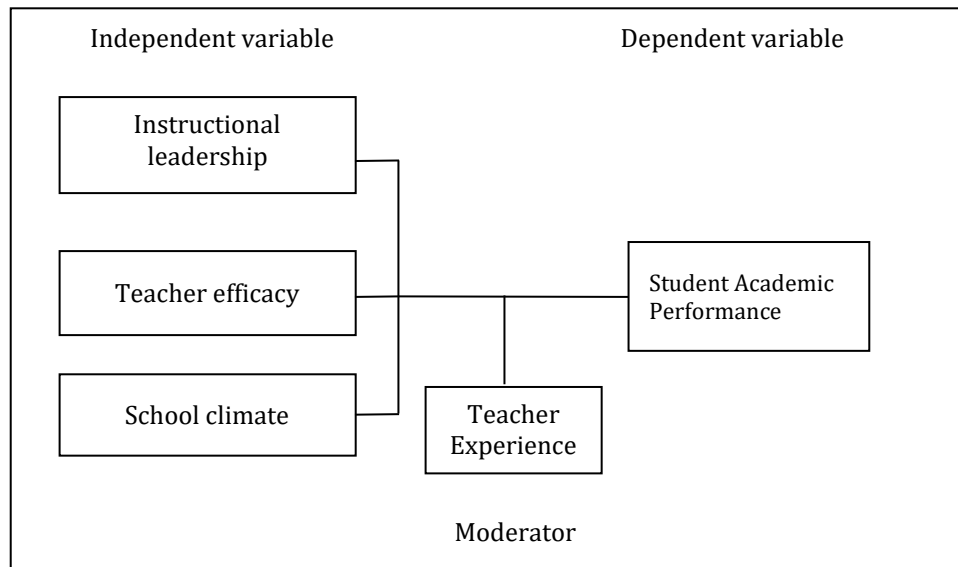


Fig. 1. Conceptual Framework

B. Sample and Data Collection

According to data collected from the Sarawak Education Department's Academic Management Sector on August 16, 2018, Sarawak's 12 administrative divisions had a total of 177 national secondary schools and 14,752 national secondary school teachers. The study, however, concentrated on teachers teaching in just six divisions of Sarawak: Betong, Kuching, Samarahan, Sarikei, Serian, and Sri Aman. The decision to divide the country into six divisions was made after conducting a unit analysis to evaluate which schools adhere to the standard national curriculum and National Education Policy in Malaysia. As a result, the school climate is consistent across all schools. Furthermore, it was a cost-cutting and time-saving measure.

The researchers conducted random sampling to determine the selection of six divisions in Sarawak as the study population. Meanwhile, data was collected from 7786 teachers teaching at 88 national secondary schools across six divisions. This study selected only teachers as samples based on findings in previous studies. Teachers were suitable to provide feedback for the study on instructional leadership. Teachers are more accurate in giving feedback compared to principals. For sampling purposes, researchers used a balanced stratification sampling approach to select 450 teachers as respondents, although only a minimum of 367 respondents is needed. A total of 381 teachers responded, which made the response rate of 84.7%, and this percentage was considered appropriate to continue with data analysis as the minimum response rate needed was 60%. Moreover, it adhered to the standard rule that to avoid 'non-response bias', 85 per cent of the sampled individuals must engage in the survey analyses.

C. Respondent's Demography

The demographic information in the analysis is based on a descriptive analysis of the respondents' number and percentage. The survey respondents in this study were 381 teachers who provided their perspectives and opinions.

Table 1. Respondent's Demography (N = 381)

Background	Respondent	Number	Percentage (%)
Gender	Male	152	39.9
	Female	229	60.1
Age	30 and below	82	21.5
	31 – 40 years	158	41.5
	41 – 50 years	114	29.9
	51 years and above	27	7.1
	Less than one year	-	-
Teaching experience	2 – 5 years	101	26.5
	6 – 10 years	79	20.7
	11 – 15 years	88	23.1
	16 years and above	113	29.7
	PhD	-	-
Academic qualification	Master's degree	59	15.5
	Bachelor's degree	322	84.5

Table 1 describes the participants' backgrounds, who were 381 Sarawak secondary school teachers. There were 152 male participants (39.9%), and 229 female teachers (60.1 per cent). In terms of age, 82 (21.5 percent) were under the age of 30, 158 (41.5 percent) were between the ages of 31 and 40, 114 (29.9 percent) were between the ages of 41 and 50, and 27 (7.1 percent) were over 51. According to their teaching experience, 101 participants (26.5%) had served between two and five years, 79 participants (20.7%) had served between six and ten years, 88 participants (23.1%) had served between eleven and fifteen years, and 113 participants (29.7 percent) had served for more than sixteen years. Finally, academic background analysis found that 59 participants (15.5%) had a master's degree, 322 participants (84.5%) had a bachelor's degree, and none had a PhD.

D. Instruments

In this investigation, three instruments were used. Section A is a questionnaire that requests respondents for demographic information such as their gender, length of service, educational attainment, and age. A questionnaire in Section B is used to evaluate a principal's instructional leadership. The 50 elements of the Principal Instructional Management Rating Scale (PIMRS) [29] were assessed on a 5-point Likert Scale from 1 to 5, with 1 indicating "never," 2 suggesting "rare," 3 indicating "occasionally," 4 indicating "frequently," and 5 indicating "always". The Teacher Sense of Efficacy Scale (TSES) (24 items) was developed by Tschannen-Moran and Woolfolk Hoy (2001) to assess teacher efficacy in Section C. The items were assessed on a 5-point Likert scale from 1 to 5, with 1 denoting 'never', 2 denoting 'rarely',

3 denoting 'occasionally', 4 denoting 'frequently', and 5 denoting 'always'. Ref. [30] measure for assessing school climate is found in Section D (21 items). The items were assessed on a 5-point Likert Scale from 1 to 5, with 1 representing 'extreme disagreement', 2 representing 'disagreement', 3 representing 'neither agreement nor disagreement', 4 representing 'agreement', and 5 representing 'strong agreement'. In this study we issued common method bias to ensure and reduce a participant's tendency to use previous answers to inform subsequent answers. The PLS-SEM model is predictive in nature, and it uses an iterative series of OLS regression to optimise the explained variance of endogenous latent variables. The academic performance of pupils was determined using the Average School Grade (ASG) from the 2018 Sijil Pelajaran Malaysia (SPM) or Malaysia Education Certificate results. The Academic Management Sector of the Sarawak State Education Department provided the ASG. It took an hour for respondents to complete the measurements.

E. Analysing of Data

Structural Equation Modelling was used to analyse multiple data sets simultaneously in order to confirm a theory or a model in order to achieve the study objectives (Figure 1). The hypotheses and variable relationships were illustrated using partial least squares SEM (PLS-SEM) in this study. Besides, PLS-SEM is capable of modelling latent variables, identifying measurement errors and testing theories. Relationships are represented in path models as circles, manifest variables (indicators/items) are represented as rectangles. Also, this study emphasizes the effect of variables and thus aims to test the theory adapted to large populations.

The data was analysed using two statistical packages: i) Statistical Package for the Social Sciences (SPSS) v.26 and ii) SmartPLS 3.0. For descriptive analysis, SPSS was utilised, and SmartPLS was employed for path analysis. PLS-SEM was determined to be the most acceptable method for evaluating the data in this study based on the nature of the problem and the statistical requirements for conducting a reliable and precise analysis. Thus, it is suitable for answering a wide range of research questions. Besides that, a critical feature of the strength of PLS-SEM is its ability to obtain high precision with small sample sizes.

Result

The indicators utilised to build the measuring model in this study were reflective forms. As a result, the researchers used three techniques suggested by Ref. [31]. Firstly, the constructs' reliability was assessed using Cronbach's Alpha and composite reliability scores. Second, to determine convergent validity, the Average Variance Extracted (AVE) value was employed. Finally, the cross-loading coefficient and the Fornell-Larcker criterion are used to determine discriminant validity.

Cronbach's Alpha was discovered to be greater than 0.6, which is acceptable within the parameters, and the composite validity value was also discovered to be greater than 0.70, which is an approved value as advised by Nunnally and Bernstein Table 2 shows Cronbach's Alpha reliability values, with the composite reliability exceeding the threshold value chosen for all variables.

Table 2. Cronbach's Alpha Reliability and Composite Reliability

Construct	Cronbach's Alpha	Composite Reliability
Instructional leadership	0.957	0.964
Teacher efficacy	0.872	0.911
School climate	0.899	0.937
Student academic Performance	1.000	1.000

To evaluate construct validity, convergent and discriminant validity testing should be used. According to Table 3, the repeated indicator method was used to determine if the convergent validity and condition criteria that were required in this study were met, namely: the composite reliability value must be greater than 0.7; the AVE value must be greater than 0.5; and the value of each item's loading must be greater than 0.7. The results showed that all individual loading items exceeded the specified value of 0.7 and that the AVE values were greater than 0.5. This result established that the instrument used in the investigation met the convergent validity criteria.

When the square root of AVE is greater than the cross-loading latency value correlation, discrimination validity is attained. Thus, the study's findings suggested that the square root of AVE was more significant than the correlation value between latent variables. These results demonstrate that the instrument employed in this investigation satisfied the criteria for discriminatory validity with cross-loading values (Table 4).

Table 3. Convergent Validity

Constructs	Loadings	Average Variance Extracted (AVE)
Instructional Leadership		0.768
P1	0.870	
P2	0.885	
P3	0.866	
P4	0.866	
P5	0.900	
P6	0.844	
P7	0.906	
P8	0.870	
Teacher Efficacy		0.831
S1	0.790	
S2	0.904	
S3	0.780	
S4	0.909	
School Climate		0.719
N1	0.934	

Constructs	Loadings	Average Variance Extracted (AVE)
N2	0.916	
N3	0.885	
Experience		
F1	0.904	
F2	0.847	
F3	0.729	
Student's Academic Performance	1.000	1.000

Table 4. Discrimination Validity (Fornel & Larker Criterion)

	Performance	Instructional Leadership	School Climate	Teacher Efficacy
Performance	1.000			
Instructional Leadership	0.389	0.876		
School Climate	0.459	0.793	0.912	
Teacher Efficacy	0.675	0.609	0.729	0.848

PLS-SEM employs the SmartPLS 3.0 path modelling application package (Table 5). The principal's instructional leadership had a significant impact on students' academic performance, as expected in H1 ($\beta=0.071$, $t=2.8952$, $p>0.05$). Hypotheses 1 and 2 are so supported. The second hypothesis (H2), that teacher efficacy increases student academic performance, is supported ($\beta=0.681$, $t=11.740$, $p>0.05$). However, for hypothesis 3 (H3), there was no significant relationship between school climate and student academic performance ($\beta=0.050$, $t=0.640$, $p>0.05$). As a result, hypotheses three and four are rejected. Table 6 summarises the outcomes of all hypotheses. Meanwhile, before analysing the structural model with PLS-SEM, the value of R² for each dependent variable (endogenous) had to be determined in order to determine the structural model's predictive potential. Thus, the R² value for the dependent variable's (endogenous) academic performance was 0.458, a value of at least 0.100 was required.

Table 5. Path Analysis and Hypothesis Testing

Hypotheses	Relationship	Standardized Beta (β)	Standard Deviation	t-Values	p-Values	Results
H1	Instructional Leadership-> Performance	0.071	0.078	2.8952	0.004	Supported
H2	Teacher efficacy-> Performance	0.681	0.058	11.740	0.000	Supported
H3	School Climate -> Performance	0.050	0.078	0.640	0.523	Rejected

Collinearity assessment:

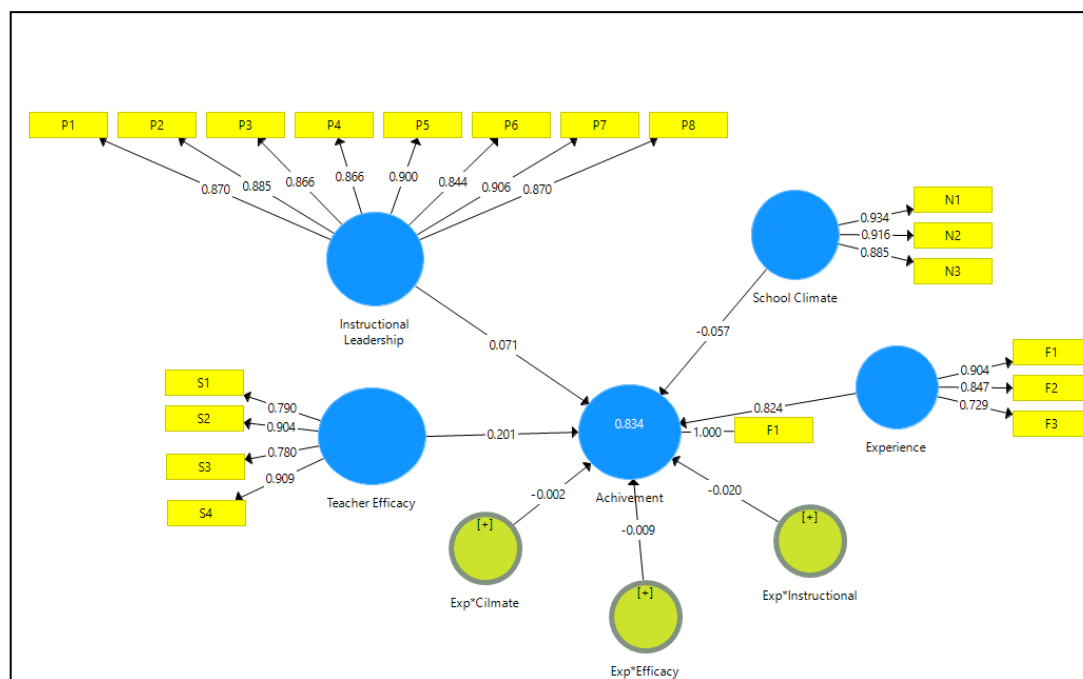
R ²	0.458
Q ²	0.405
Effect Size (f ²):	
Instructional leadership	0.003
Teacher Efficacy	0.452
School Climate	0.001

To evaluate the effect of teacher experience as a moderator (H4) on the relationship between the independent and dependent variables, the product indicator technique was used. The hypothesis (H4) indicated the moderating effects of teacher experience (Experience*), which included H4a, H4b, and H4c (Table 6).

Table 6. Example table

Hypotheses	Relationship	Standardized Beta (β)	Standard Deviation	t-Value	p-Value	Results
H4 _a	Experience*Instructional → Performance	-0.020	0.034	0.583	0.560	Rejected
H4 _b	Experience*Efficacy → Performance	-0.009	0.036	0.245	0.807	Rejected
H4 _c	Experience*Climate → Performance	-0.020	0.043	0.043	0.966	Rejected

According to Table 6, the relationship between the independent variables (instructional leadership, teacher efficacy, and school climate) and the dependent variable (student academic performance) was unaffected by teacher experience. As a result, all three hypotheses (H4a, H4b, and H4c) were rejected. Due to these limitations, teacher experience (Experience*) as a moderator had no effect on the relationship between principals' instructional leadership, teacher efficacy, school climate, and student academic performance (Figure 2).

**Fig. 2.** Structural Model Evaluation

Overall, this research found a link between principals' instructional leadership and teacher efficacy and students' academic performance. Additionally, teacher efficacy had a significant impact on student academic performance. However, the results demonstrated that

school climate has no significant impact on student educational performance. Furthermore, of the three primary hypotheses proposed, H1 and H2 were supported, but H3 was rejected. The study findings also revealed that H4a, H4b, H4c, and H4d were rejected, indicating that teaching experience was not a relevant moderator variable.

Discussion

The objectives of this paper were to see how instructional leadership, teacher efficacy, and school climate affect students' academic performance. The findings revealed that principals' instructional leadership and teacher efficacy significantly impact students' academic performance. This result is consistent with the study's hypotheses. However, the results showed that school climate did not significantly influence students' academic performance. The importance of this study is that findings differ from what has been opined by previous researchers who used the same school climate and teacher experience surveys. Therefore, this study showed that school climate is not a contributor and did not influence student academic performance in Sarawak secondary schools. This demonstrated that teachers' efficacy is more important for enhancing pupils' academic progress.

This study contradicts Ref. [6] findings that a construct of instructional leadership had no discernible effect on student performance in China. The current study confirms the findings of Ref. [2,32] who found a link between principal instructional leadership and student academic performance. Furthermore, the current study supports Ref. [33] findings from a study of 387 secondary school teachers in Johor. With $r = 0.245$ and $\text{sig} = 0.000$ ($p < 0.05$), their study discovered a substantial positive association between a principal's instructional leadership and students' academic performance.

Moreover, this study found that the principal's instructional leadership improves students' academic performance, which is consistent with Ref. [34]. Since the findings demonstrated the impact of instructional leadership practises on students' academic performance, instructional leadership practises should be strengthened further, as experts in the field have confirmed the critical role of instructional leadership in improving students' academic performance at school. Likewise, the findings of this study corroborated those of Ref. [35], who found a significant relationship between a principal's instructional leadership and academic performance despite the low correlation. In the meantime, a study of principals' leadership in Malaysia discovered a correlation between instructional leadership levels and students' academic performance. The current study echoed this finding as well. Additionally, this study supports Ref. [36] who asserted that instructional leadership plays a critical role in enhancing students' academic performance.

Additionally, the results of this study support those of Ref. [37,38] who found a strong and favourable association between teacher efficacy and student academic performance. It contrasted; however, Ref. [20] results in that teacher self-efficacy did not affect the classroom mean mathematical performance of eighth-graders in Sweden. Further, the findings of this study contradicted those of Ref. [39] who suggested a significant difference in student performance as a result of school climate. The findings of this study revealed that teacher experience (three-year or more) did not act as a moderator in the link between the independent and dependent variables.

Conclusion

This study's findings contribute to the current body of knowledge in a number of ways. Previous study has shown that the outcomes of research carried out in different countries differed significantly. The current study found a robust relationship between principals' instructional leadership, teacher efficacy, and school climate. This could be because principals are committed towards their responsibility to support teachers in carrying out teaching and learning as their core duty in school. Besides, the Malaysia Blueprint places a lot of emphasis on school principals as being instructional leaders and comprehensive professional development courses has been carried out to improve their leadership skills.

Furthermore, the results showed that principals' instructional leadership and teacher efficacy had a significant impact on students' academic performance. This could be because the students in rural districts in Sarawak depend totally on teachers and school leaderships for academic guidance and this is reflected by the findings in this study. Meanwhile, there is no evidence that school climate has a significant impact on the academic performance.

In conclusion, this study shows indisputably that principal instructional leadership and teacher efficacy have a significant impact on students' academic performance. However, the link between school climate and academic performance is weak. As a result, if principals' instructional leadership and teachers' efficacy are successfully and consistently implemented in schools, they can improve students' academic performance.

Furthermore, the influence of teachers' experience had no significant impact on student performance. School environments or climates must be emphasised and revisited in order to foster strong collegial connections among teachers, school principals, and teachers. All secondary schools, particularly those in rural locations such as Sarawak, should promote an assertive and professional working atmosphere. Furthermore, the Ministry of Education should enhance laws that ensure equal distribution of more experienced teachers and limit rookie teacher placement in rural secondary schools in collaboration with the respective state education ministries.

The findings of this study contribute to the field of knowledge in the area of principal training or professional development principals by suggesting that constructive input on instructional leadership training should be provided by specialised institutions such as the Institute Aminuddin Baki (IAB), Malaysia, which is a management and educational leadership training centre under the Malaysian Ministry of Education. As a result, the findings of this study can help the IAB in coordinating, reviewing, restructuring, and establishing new systematic course modules on leadership and the on-going professional development of school administrators and teachers.

Suggestion and Limitation

As this was a cross-sectional study, it is suggested that a longitudinal study be conducted to make more comprehensive conclusions. Since this study focuses solely on teachers as respondents, more extensive research should be undertaken among principals. This circumstance may cause a teacher's evaluation to be distorted. In addition, future work could modify the instruments used in this study by integrating principals and parents as respondents to eliminate bias in research. A longitudinal strategy that allows future researchers to evaluate instructors' self-efficacy across diverse teaching experience spans is highly recommended. Finally, mixed-method research can improve rigour while also enriching analysis and findings.

The current study has several limitations that are worthy of reflection. The sample size of 450, although enough to represent the population and to be analysed using PLS-SEM, is considered small to investigate the variables. Moreover, the research only employed a quantitative design that used a questionnaire to collect empirical data to save time and cost. Furthermore, only national secondary schools were considered in selecting the respondents. Private, technical and religious schools were not included. Besides, the survey was self-reported, and it cannot be determined if the questions were interpreted as the researchers had initially intended. The small sample size and limited location could have affected the results of the present research. All these factors should be given due consideration when designing future studies.

Conflict of Interest

We declare that there is no conflict of interest.

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