

A study on exploring the effects of the school climate and teacher's accountability on academic performance of students in early childhood care and education

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ABSTRACT

This study investigates parental perceptions of school climate, teachers' accountability, and students' academic performance, as well as the relationship among these three factors. The descriptive research uses the demographic background of parents as a stratified sampling method to collect primary data. The statistical procedure shows that Pearson's product-moment correlations between school climate and teachers' accountability affect the academic achievement, with effect sizes of $r=0.632$, $r=.646$, which significantly correlate with each other. Regression analysis reveals the variability of the effect sizes of school climate and teachers' accountability on academic achievement, with the values of $\beta=0.070$ and $\beta=0.115$. The independent variable, school climate and teachers' accountability, explains 45.4% of the variability of academic performance of the students in early childhood care and education. The present study recommends that training teachers would link their accountability and measures to track the supportive climate of school to improve the student's academic performance. Future research should conduct longitudinal studies to examine how relationships between school climates and teachers' accountability affect different student populations and their academic performance.

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1. INTRODUCTION

Early childhood is an important period for progress and development [1], [2]. It focuses on development, including basic care, education [3], makes the child to mature and prepare for a smooth transfer to formal school [4], [5]. A rich school climate and teachers' accountability enable children to experiment, explore and express themselves to others [6], [7]. It supports their social, mental, physical, psychological, health and nutritional development, from birth to the primary school going age [8]. It also nurtures students' academic performance [9].

However, global policymakers, educators, and researchers are trying to identify how best to measure students' academic performance, school climate and teachers' accountability to promote learning outcomes in early childhood care and education (ECCE) [10], [11]. For decades, many countries have used the test performance of students to evaluate academic achievements and educational outcomes. Despite many studies and efforts, the outcome is still elusive [11], [12]. The primary aim of the present study is to examine the relationship among the test scores of the school climate, teachers' accountability and their influence on the academic performance of students [13].

The teaching career in India has undergone significant reform due to the educational policy of 2020. The near-continuous state of change in students' academic performance on large-scale assessments has become the progress benchmark for reform efforts [14]. Moreover, teachers are accountable for students' academic performance and progress based on their formative and summative assessment [15], [16]. The school climate is an important factor for their academic performance [17]. However, school climate influences teachers' efficacy, classroom environment and students' academic performance [18].

The key findings of the research will assist the school administration in ECCE, providing a healthy environment to enhance students' academic performance [19], [20]. Furthermore, the study will determine a strong school environment and enable students to accomplish their potential for learning in a more effective way [21]. Teachers' accountability upholds the commitments, values and expectations of parents as well as students [22]. Therefore, the study explores the influence of the school climate and teachers' accountability on the academic performance of students in ECCE [23]. The present study creates 'win-win' situations for parents, teachers and children. The research objectives of the study are: i) to determine the relationship between school climate and students' academic performance in ECCE; ii) to examine the relationship between teachers' accountability and students' academic performance in ECCE; and iii) to identify the impact of teachers' accountability and school climate on students' academic performance in ECCE. Furthermore, the research questions of the study are:

- What is the relationship between school climate and students' academic performance in ECCE?
- What is the relationship between teachers' accountability and students' academic performance in ECCE?
- To what extent do teachers' accountability and school climate influence students' academic performance in ECCE?

2. THEORETICAL BASIS

The present study employed Bronfenbrenner's [24] social ecological model for school climate in ECCE. At the proximal level, the contextual factors were those of well-being and psychosocial development through the school, family and teachers [25]. This study focuses on the dynamics of the Mesosystem layer to describe the interaction of children with their school climate [26]. In ECCE, the ecological perspective provides the analysis of child development against the broader scope of school climate and environment [27]. School climate research emphasizes the significance of the school climate and teachers' accountability as facilitating or inhibiting academic performance [27]. The interaction between teachers and parents affects the child's cognitive development. The study describes the impact of the school climate on the child's cognitive development [28].

Teachers' accountability is significant in improving students' academic performance of students. Dewey [29] explains the influence of accurate and appropriate behavior of instructors and their responsibility towards their decisions and actions in the teaching and learning process of students [30], [31]. Teachers' accountability refers to formulate learner-centered approach to support beliefs related to positive interactions with students, enhancing their academic performance [32]. Learner-centered educators believe that work is supportive of many of their beliefs related to how students learn. This study explores how positive interactions between students and teachers can improve academic performance [33].

Eccles and Wigfield [34] have nuanced the dichotomy between distal and proximal determinants in relation to the academic performance of children. The two different dimensions and approaches combine and coordinate to make children more involved and committed to the ability and performance of the activity [35]. The proximal determinants (expectation of success and subjective task values), influence the academic performance and performance-related behavior. The school climate can monitor and evaluate the performance of teachers with rewarding systems and training to discipline the practices and behavior, to increase the academic performance of the students [36]. The conceptual framework is presented in Figure 1.



Figure 1. Conceptual framework

Research shows that those students with more support from their school and teachers report higher levels of academic performance [37]. Therefore, students who have a strong relationship with the teachers

and schools have better academic and behavioral outcomes [38]. Finally, school climate and teachers' accountability are the key players in the academic performance of students in ECCE. Furthermore, positive school climate and teachers' accountability influence the overall development of the students [39].

3. METHOD

Cross-sectional research design is used for the present research. The descriptive method with deductive approach examines the relationship between school climate, teacher's accountability and academic performance of the students. The study also explores the effect of school climate and teacher's accountability on the academic performance of the students in ECCE.

3.1. Research design

Quantitative study used 5-level Likert questionnaires to assess the research instrument, checking the perception of parents towards the independent variables of school climate and teachers' accountability. The research used the ASER toolkit [40] to evaluate the academic achievement as a dependent variable. Each item of the questionnaire was assessed with a mean score. Correlation of school climate, teachers' accountability and academic achievement was evaluated. Inferential statistics was used to evaluate the linear model with multiple linear regression analysis. The study examines how well school climate and teachers' accountability influence the academic performance of the students.

3.2. Population and sample

The population of the research comprises parents from the Saundatti and Chikodi districts of Belgaum, Karnataka, India. A total of 500 parents from the Saundatti and Chikodi districts of Belgaum, Karnataka, India, participated in the research. The sample size illustrates the parents from the selected district. Therefore, the sample size is adequate for representing population. Stratified sampling technique was applied to categorize parents into strata based on age, education and socio-economic background.

3.3. Questionnaire

The present study used a questionnaire consisting of two parts. Part I is the school climate questionnaire of Schueler [41] with 17 items, whereas the teachers' accountability questionnaire by Kucukturan [42] consists of 13 items and the academic performance of the students is assessed with the Annual Status of Education Report (ASER, 2023), Do-It-Yourself (DIYA) tool kit. Part II is the demographic information of the participants with age, education and socio-economic background.

4. FINDINGS

4.1. Correlation tests between school climate and students' academic performance

Hypothesis 1 evaluates the effects of school climate on students' academic performance in ECCE. Pearson correlation is used to measure the relationship between the items of school climate and students' academic performance. Table 1 shows the Pearson correlation between school climate and the students' academic performance.

- H0: There is no significant relationship between the school climate and students' academic performance in ECCE.
- H1: There is a significant relationship between the school climate and students' academic performance in ECCE.

Pearson's correlation test shows the significant relationship between the students' academic performance and school climate (Table 1). The result of the test shows that students' academic performance is significantly affected by the school climate ($r=0.632$, $p=0.001$). It indicates a strong positive moderate correlation between the teacher's accountability and academic performance.

Table 1. Correlation between the school climate and students' academic performance in ECCE

Variable		School climate scores	Students' academic performance
Teachers climate score	Pearson correlation	1	.632
	Sig. (2-tailed)		<.001

4.2. Correlation tests between teachers' accountability and students' academic performance

Hypothesis 2 explores whether students' academic performance is affected by the teachers' accountability in ECCE. Pearson correlation has been employed to evaluate the relationship between the

items of teachers' accountability and students' academic performance. Table 2 shows the Pearson correlation between teachers' accountability and students' academic performance.

- H0: There is no significant relationship between teachers' accountability and students' academic performance in ECCE.
- H1: There is a significant relationship between teachers' accountability and students' academic performance in ECCE.

The Pearson correlation enables one to measure the strength and direction of a linear association between two variables, and the value is given as r . Through Pearson correlation, an attempt is made to calculate the relationship based on the raw values of the variables, using covariance and standard deviations. From Table 2, it is evident that all the variables, namely, teachers' accountability and students' academic performance, are highly significantly correlated with each other. Teachers' accountability was positively correlated with ($r=.646$, $p=0.001$) (at 10% level). The null hypothesis 2 is rejected. The results suggest that teachers' accountability increases students' academic performance. The result of the Pearson correlation inferred that teachers' accountability could boost students' academic performance.

Table 2. Correlation between teachers' accountability and students' academic performance in ECCE

Variable		Teachers' accountability score	Students' academic performance
Teachers' accountability score	Pearson correlation	1	.646
	Sig. (2-tailed)		<.001
	N	500	500

4.3. Findings based on the tests of regression analysis between school climate, teachers' accountability, and students' academic performance

Hypothesis 3 determines the linear regression analysis to predict the causal inference between school climate, teachers' accountability, and students' academic performance. Regression analysis is primarily used to determine the linear equation of the predictor variables producing the most significant influence on the response. Table 3 signify the model summary between teachers' accountability, school climate, and students' academic performance in ECCE.

- H0: There is no main interaction effect of school climate and teachers' accountability on students' academic performance in ECCE.
- H1: There is main interaction effect of school climate and teachers' accountability on students' academic performance in ECCE.

The model summary (Table 3) shows that there is a moderate correlation between the dependent variable of academic performance and the independent variable of school climate and teachers' accountability ($R=.676$). Table 4 presents the ANOVA of students' academic performance, school climate, and teachers' accountability. Table 5 indicates the coefficients for the relationships between teachers' accountability, school climate, and students' academic performance in ECCE. The independent variable of academic performance of students explains 45.8% of the variability of the dependent variables - school climate and teachers' accountability - in this model. The independent variable, school climate and teachers' accountability, explains 45.4% of the variability of the dependent variable - academic performance of the students in ECCE. The effect size is large at 0.454 (45.4%) according to Cohen [43].

Table 3. Model summary between teachers' accountability, school climate, and students' academic performance in ECCE

Model	R	R Square	Adjusted R Square	Model summary ^b		Change statistics		
				Std. Error of the estimate	R Square change	F change	df1	df2
1	.676 ^a	.458	.454	3.109	.458	139.432	3	496

Table 4. ANOVA between students' academic performance, school climate, and teachers' accountability

ANOVA ^a				
Model	Sum of Squares	Df	Mean Square	F
Regression	4042.729	3	1347.576	139.432
Residual	4793.719	496	9.665	
Total	8836.448	499		

a. Dependent variable: students' academic performance

Table 5. Coefficient between teachers' accountability, school climate, and students' academic performance

Table 5: Correlation between teachers' accountability, school climate, and students' academic performance						
Model	Coefficients			T	Sig.	95.0% confidence interval for B Lower bound
	Unstandardized coefficients		Standardized coefficients Beta			
	B	Std. Error				
1 (Constant)	-1.050	.608		-1.725	.085	-2.245
School climate scores	.070	.046	.126	1.514	.131	-.021
Teachers accountability score	.115	.023	.317	4.957	<.001	.069

A linear regression established that the academic performance of the students statistically significantly predicts the school climate, $F(3,496) = 139.432$, $p < .0005$, and teachers' accountability accounted for 13% of the explained variability in the academic performance of the students. The regression equation predicted the academic performance of the students = $-1.050 + (0.070 \times 0.115) = 2.33$. The summary of regression analysis shows the significant influence of teachers' accountability and school climate on the academic performance of the students in ECCE.

5. RESULTS AND DISCUSSION

The finding shows that after adopting the theoretical lens of developing ability, the results add to the literature on school climate and teachers' accountability associated with the academic performance of students across ECCE in Karnataka. The research reveals the empirical evidence on structured enhancement of the academic performance of students in ECCE. With this study, the data analysis evaluates the perceptions of parents about school climate and teachers' accountability and academic performance of students in ECCE. The study demonstrates the moderate to strong positive correlation between teachers' accountability and academic performance ($r = 0.632$, $p = 0.001$) and school climate and academic performance ($r = 0.646$, $p = 0.001$). The study found that school climate and teachers' accountability explain 45.4% of the variability of the dependent variable, academic performance of the students in ECCE. The effect size is large at 0.454 (45.4%).

The study reveals that after adopting the theoretical lens of developing ability, the result adds value to the literature on school climate and teachers' accountability associated with the academic performance of students across ECCE in Karnataka. The research reveals the empirical evidence on structured enhancement of academic performance of students in ECCE [44]. Additionally, the conceptual model shows that there is a positive moderate association between school climate, teachers' accountability and academic performance of the students.

The study determines that the policies for teachers' accountability can be more effective with performance-based accreditation from the school to make them more accountable to students' performance [45]. The study supports the school climate with educational resources, creating a positive atmosphere for teachers to stimulate the academic skills and cognitive activities of students [46]. Darling-Hammond [47] suggests that reclamation of accountability can happen through 'collective action and a reassertion of academic and professional values.' The result of the present study is consistent with prior research that poorer school climate affects the cognitive and psychomotor development of students [48].

Tomaszewski *et al.* [49] explore the potential mechanisms underlying the relationship between the school climate and students' academic achievement. The regression analysis shows the association between the school climate's improved achievements on students' engagement [50]. Study by Amsalu and Belay [51] found the effects of the school climate on students' learning performance. The correlational design shows the mediation effects of the positive professional learning-teaching environment of school climate on students' learning achievement [52], [53]. More research is needed on low engagement in teachers' accountability and adverse effects on students' academic performance [54].

The present study is limited to evaluating the relationship between the school climate and teachers' accountability on students' academic performance, with smaller sample sizes in ECCE. A longitudinal study can be conducted to investigate how the school climate factors affect the academic performance, and secondly, how teachers' accountability factors influence the academic performance in ECCE. Future research can collect data from larger samples across different states in India.

6. CONCLUSION

The findings and reflections of the study show the parents' relationship with teachers' accountability and school climate with the academic achievement of the students. This research highlights the results in three themes, such as the impact of the school climate on academic achievement, the impact of teachers' accountability on academic achievement and the association between teachers' accountability, school climate and academic performance. Unlike other research, this study ensures the importance of teachers'

accountability and school climate on improving the academic performance of students. This research signifies the need to highlight the rational approach in the teaching-learning process and to develop the academic performance with a large number of participants and qualitative analysis.

Dimensions of teachers' accountability and school climate on students' academic performance are well-supported empirically in previous research, with less attention given to their dimensions. In line with the conceptual framework on academic performance, our findings show that the dimensions' comparison supports the effects on students' achievement. Findings of the study suggests that school climate and teachers' accountability add value to the conceptual framework on academic performance of the students.

At the same time, the study uses a stratified sampling within a short time frame in Karnataka, India. The findings support other researchers to obtain more valid and reliable outcomes. Moreover, the theoretical framework and statistical data provide useful information to investigate the impact of the school climate and teachers' accountability on the academic performance of the students, with some factors other than those stated in the present study. Therefore, the study recommends that researchers should investigate different approaches for better outcomes when exploring the school climate and teachers' accountability affecting the academic performance of students in ECCE in India and other countries.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

The research has ethical clearance from the Institutional Review Board (IRB). The consent forms for the participants have been included within the application form. Respondents have the freedom to eliminate the questions as per their convenience. The respondent's data have been kept confidential.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [KN], upon reasonable request.

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