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Study on Quality of Preschool Education through Effective Teaching Practices in Selected Public Preschools of China

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Abstract

Regardless of income level, early childhood education is crucial in preparing children for school. In China, although progress has been made in increasing access to preschool education, maintaining quality remains a challenge. The present study examines the impact of learning environments, teacher competence, interactive teaching and school inspection on the quality of preschool education in China. The aim is to improve understanding and inform strategies for comprehensive child development. The research combines qualitative methods using open-ended interview questions and quantitative methods using closed-ended questionnaires. The results show that teachers from different age groups, educational backgrounds, teaching experiences and regions have different perceptions of teacher competence, interactive teaching and quality of pre-school education. Notably, there is a positive and significant relationship between these factors, with teacher competence having the greatest influence on the quality of preschool education.

Keywords: Education Quality, Preschool Education, Teaching Practices

Introduction

High-quality preschools prepare children for school and strengthen the entire education system. They consistently predict school readiness, reduce achievement gaps, ensure equity and minimise the need for costly interventions. Economic analyses worldwide emphasise the high returns on investment in early childhood education. However, global progress in preschool enrolment has been slow and uneven. In 2017, only 50% of children of preschool age had access to preschool education, leaving 175 million children without basic skills. The shortage of qualified preschool teachers is a major barrier. In 2016, nearly 17% of preschool children lived in low-income countries, but only 4% had teachers who met their educational needs.

SABER data is the main source of information on early childhood teacher qualifications. The global database lacks depth and quality information on training. Most early childhood teachers are female, younger and less experienced. Furthermore, only 20 of the 34 countries with data oversee pre-service training for early childhood care and education professionals, highlighting the need for comprehensive reform and support. Globally, 38% of countries allocate less than 2% of their education budget to preschool education. To encourage the necessary investment, governments should allocate at least 25% of their recurrent budgets for preschool education to non-wage costs. There is limited comparable global data on the quality of preschool education, particularly on teaching and learning processes, with a focus on structural quality. Over the past five years, 55 countries have not reported data on expenditure on preschool education, indicating a lack of attention to quality assurance.

Problem Statement

The quality of preschool education is crucial as it lays the foundation for children's holistic development and the overall effectiveness of the education system. However, preschool education faces global challenges, including disparities in enrolment and a shortage of qualified teachers. These issues are compounded by limited domestic and international funding and a lack of comprehensive data for informed decision-making. Public preschools in China face constraints such as large class sizes, teacher shortages and limited opportunities for professional development. The present study aims to assess the impact of teacher competency and interactive teaching on the quality of preschool education in China. The aim is to improve our understanding of these factors and provide guidance on strategies to promote children's holistic development.

Limitations

Quantitative methods provide valuable numerical insights, but may not capture the complex nuances of factors such as teaching practices, teacher competencies and learning environments. Cross-sectional research designs, while efficient, make it difficult to explore changes or trends over time. The complex interplay of language and cultural subtleties poses challenges for survey questions and qualitative responses. Ensuring the validity of data requires careful translation and cultural sensitivity. This study may not fully account for external contextual factors and may overlook the influence of socio-economic status, parental involvement and local policies on teaching practices and quality of education. Finally, involving different stakeholders, including teachers, school leaders, parents and others, in both quantitative and qualitative data collection may require significant resources and time.

Research Questions

The following research questions and corresponding hypotheses guided present study:

1.What are the effects of learning environment, teacher competency, interactive teaching and school inspection on the quality of preschool education in public preschools?

2.How to improve the performance of preschool education quality in public preschools in China?

Research Objectives

1.To assess the impacts of learning environment, teacher competency, interactive teaching and school inspection on the quality of preschool education in public preschools.

2.To provide suggestion to improving the performance of quality preschool education in public preschools of China.

Research Methodology

Surveys collect data from samples using questionnaires or interviews to elicit specific responses about participants' attitudes, behaviors, opinions and characteristics. Interviews are a primary qualitative technique, allowing one-on-one conversations to elicit personal perspectives and narratives, facilitating the expression of thoughts, motivations and experiences. Mixed methods research combines these approaches to tailor research and promote rich understanding. In this study, a mixed research paradigm, drawing on positivism and interpretivism, comprehensively discusses factors influencing the quality of preschool education in China's public preschools to promote children's holistic development.

The study focuses on teachers working in public kindergartens in Yubei District, Chongqing, China. The study involved the administration of closed-ended questionnaires to a carefully selected sample of public kindergarten teachers. In addition, the research complements its methodology by including input from key stakeholders through open-ended interviews. This inclusive approach includes two respected principals, three outstanding teachers, and a group of four engaged and insightful parents.

Data Analysis Plan

Collect and organise survey responses and interview transcripts. Ensure data quality by addressing missing or erroneous entries. Compute descriptive statistics for quantitative survey data and summarise qualitative interview data by identifying common themes and patterns. Analyse relationships between variables using SPSS for quantitative data. Visualise key findings using charts, graphs and tables. Undertake thematic analysis of interview transcripts using NVivo software for coding and data management. Interpret findings according to research objectives and relevant literature. Discuss implications and significance, summarise key findings and make recommendations.

Reliability

The present study, SPSS software was used to assess the reliability of the scale using Cronbach's alpha coefficient. Typically, coefficients greater than 0.70 indicate higher reliability, with higher values reflecting greater internal consistency between the measured variables. The Cronbach's alpha coefficients for learning environment, teacher competency, interactive teaching, school inspection and quality of preschool education ranged from 0.883 to 0.959, indicating excellent internal consistency between these variables(see below).

Reliability analysis

variable	Number of items	Cronbach's α
Teacher competency	7	0.911
Interactive teaching	6	0.959
Quality of Preschool Education	6	0.883

Validity

In the present study, we used exploratory factor analysis (EFA). First, we conducted the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test. The KMO test yields a value between 0 and 1, with higher values indicating greater suitability for factor analysis. According to Kaiser's (1970) criteria, KMO > 0.9 indicates high suitability, 0.8 to 0.9 indicates good suitability, 0.7 to 0.8 is considered moderate, and below 0.6 indicates poor suitability for factor analysis. Higher KMO values indicate better fit, while lower values may require alternative methods of data

analysis. Bartlett's sphericity test assesses the null hypothesis that the correlation matrix (Pearson correlation matrix) is an identity matrix, indicating no correlations between variables and unsuitability for factor analysis. Rejection of the null hypothesis ($p < 0.05$) indicates the presence of correlations between variables, supporting the appropriateness of factor analysis.

In the present study, the KMO value was 0.921 and the chi-square value of the Bartlett sphericity test was 7267.793 with 465 degrees of freedom (see below). The significance level was below 0.001, confirming the suitability of the scale data for exploratory factor analysis.

KMO and Bartlett's Test

KMO sample appropriateness measure		0.921
Bartlett's sphericity test	Approximate Chi-Square	7267.793
	Degrees of freedom (df)	465
	Significance Level (p-value)	0.000

Exploratory Factor Analysis

Common factors were extracted using variance-maximising rotation, retaining only those with eigenvalues > 1. The results were consistent with the expected factor structure, indicating the presence of common factors. Each factor had loadings > 0.5 for its component items, and cross-factor loadings remained < 0.4. These factors accounted for 72.973% of the total variation, indicating strong validity and effective capture of essential information from the original scale items (see below).

Exploratory factor analysis result

Eigenvalue	13.554	3.391	2.645	1.790	1.241
Percentage of Variance	43.724	10.939	8.533	5.775	4.003
Cumulative Explained Variance	43.724	54.663	63.195	68.970	72.973

Quantitative Data Analysis

Demographic Statistics

Females make up 90.8% of the population, while males make up only 9.2%. The age distribution of pre-school teachers in the region is balanced, with the highest proportion in the 31-36 age group (38.6%), followed by the 37-42 age group (24.7%). There are few teachers aged under 25 and over 42. In terms of academic qualifications, the majority have a Bachelor's degree (43.0%), followed by those with a Master's degree (23.1%). Teachers with a junior college degree, high school diploma or less are in the minority. Regarding teaching experience, the most common range is 3-4 years (38.6%), followed by 5-6 years (22.7%). Teachers with less than one year or more than seven years of experience are less common. Geographically, teachers are mainly located in villages and towns, with 41.4% in rural areas and 33.9% in urban areas. The proportion of teachers in urban areas is lower at 24.7%(see below).

Frequency Counts for Demographic Variables			
Variables		N	%
Gender	Male	23	9.2
	Female	228	90.8
Age	below 25	20	8.0
	25-30	36	14.3
	31-36	97	38.6
	37-42	62	24.7
	More than 42	36	14.3
Education Background	Certificate	18	7.2
	Associate degree	32	12.7
	Bachelor	108	43.0
	Master	58	23.1
	Others	35	13.9
Teaching Experience	1 year or less	14	5.6
	1-2 years	36	14.3
	3-4 years	97	38.6
	5-6 years	57	22.7
	7 years or more	47	18.7
Administrative Area	Village	104	41.4
	Town	85	33.9
	City	62	24.7
	total	251	100.0

Learning Environment Descriptive

Preschool teachers rated different aspects of the learning environment, each with its mean and standard deviation.

Places and facilities: Mean = 3.490, Std. Deviation = 1.111.

Personal care practices: Mean = 3.474, Std. Deviation = 1.177.

Environmental support for language development: Mean = 3.606, Std. Deviation = 1.176.

Nature, appropriateness and participation in activities: Mean = 3.502, Std. Deviation = 1.214.

Quality and frequency of interactions with carers/teachers: Mean = 3.590, Std. Deviation = 1.198. Cooperation between teachers and parents: Mean = 3.645, Std. Deviation = 1.155.

Safety and welfare measures for young children: Mean = 3.633, Std. Deviation = 1.190.

Teacher Competency Description

Teachers' abilities in different aspects of their role were assessed with mean scores and standard deviations as follows(see below)

Understanding of child development theories and individualised teaching: mean = 3.741, std. Deviation = 1.070.

Designing appropriate curricula and learning experiences: Mean = 3.657, Std. Deviation = 0.997.

Observing, recording and assessing children's progress: Mean = 3.625, Std. Deviation = 1.010.

Creating an organised, safe and inclusive learning environment: Mean = 3.614, Std. Deviation = 1.116.
Communicating effectively with children, colleagues and parents: Mean = 3.861, Std. Deviation = 1.142.
Sensitivity to cultural and linguistic diversity and creating an inclusive classroom: Mean = 3.805, Std. Deviation = 1.087.
Professional development, self-reflection and commitment to continuous improvement: Mean = 3.841, Std. Deviation = 1.084.

Results of statistical analysis of describing the teacher competency

Teacher Competency	Mean	Standard Deviation	Skewness	Kurtosis
TC1: Teachers' understanding of child development theories and milestones, and the ability to use this knowledge to tailor teaching to individual children's needs	3.741	1.070	-0.969	0.722
TC2: The ability of the teacher to design curricula and learning experiences that are developmentally appropriate	3.657	0.997	-1.100	1.362
TC3: Teachers' capacity for observation, documentation and assessment of children's progress	3.625	1.010	-1.099	1.217
TC4: Teacher skills in creating an organised, safe and inclusive learning environment	3.614	1.116	-0.566	-0.022
TC5: The ability of the teacher to communicate effectively with children, colleagues and parents, using appropriate language and strategies	3.861	1.142	-1.023	0.571
TC6:Teachers' awareness of and sensitivity to cultural and linguistic diversity and their ability to create an inclusive and respectful classroom environment	3.805	1.087	-1.300	1.428
TC7:The commitment of the teacher to ongoing professional development, self-reflection and continuous improvement	3.841	1.084	-1.427	1.715

Interactive Teaching Description

Teachers' abilities in various aspects of their role, along with their respective means and standard deviations(see below)
Creating a warm and caring classroom environment: Mean = 3.709, SD = 1.293.
Providing a sense of safety and effective behaviour management: Mean = 3.741, SD = 1.207.
Managing behaviour with clear expectations and positive discipline: Mean = 3.849, SD = 1.243.
Maximising instructional time and engagement: Mean = 3.777, SD = 1.209.
Providing meaningful feedback and encouraging critical thinking: Mean = 3.797, SD = 1.234.
Using a variety of languages to support language development: Mean = 3.709, SD = 1.311.

Results of statistical analysis of describing the interactive teaching

Interactive Teaching	Mean	SD	Skewness	Kurtosis
IT1: Teacher creates warm, nurturing, positive classroom environment where children feel valued is crucial for ensuring Quality of Preschool Education	3.709	1.293	-0.575	-0.820
IT2: Teacher promotes a sense of security for children by effectively addressing and minimising negative behaviours and disruptions.	3.741	1.207	-0.495	-0.770
IT3: The teacher establishes clear expectations and routines, effectively managing classroom behaviors while promoting positive discipline	3.849	1.243	-0.705	-0.723
IT4: The teacher maximizes instructional time and keeps children engaged in learning activities through smooth transitions and efficient use of resources	3.777	1.209	-0.754	-0.351
IT5: Teacher provides meaningful feedback to children's contributions, extending their understanding and encouraging their thinking	3.797	1.234	-0.856	-0.265
IT6:Teacher actively uses rich and varied language to promote children's language development and expressive skills	3.709	1.311	-0.747	-0.545

School Inspection Description

The preschool teachers' assessment of the school inspection for ensuring the quality of early childhood education was as follows

Overall importance of school inspection criteria: Mean = 4.008, SD = 1.088.
Importance of frequency and method of inspection: Mean = 4.131, SD = 1.140.
Importance of public reporting of results: Mean = 4.139, SD = 1.187.
Importance of professional quality of supervisors: Mean = 4.016, SD = 1.088.
Importance of feedback to ensure quality: Mean = 4.167, SD = 1.086.

Results of statistical analysis of describing the school inspection

School Inspection	Mean	SD	Skewness	Kurtosis
SI1: School inspection standard is crucial for ensuring Quality of Preschool Education	4.008	1.088	-1.143	0.879
SI2:Frequency and method of school inspection is crucial for ensuring Quality of Preschool Education	4.131	1.140	-1.356	1.145
SI3:The public reporting of school inspection is important for ensuring Quality of Preschool Education	4.139	1.187	-1.503	1.481
SI4: The degree of professionalism of the inspectoris important for ensuring Quality of Preschool Education	4.016	1.088	-1.253	1.236
SI5: The feedback of school inspection is crucial for ensuring Quality of Preschool Education	4.167	1.086	-1.357	1.310

Statistical Analysis of Preschool Education Quality

The preschool teachers' assessments of the factors influencing the quality of preschool education were as follows:

Importance of teacher-child relationship: Mean = 3.992, SD = 1.073.
Importance of curriculum and teaching: mean = 3.940, SD = 1.047.
Importance of effective leadership, communication and management: Mean = 3.777, SD = 1.050.
Importance of continuous evaluate: Mean = 4.016, SD = 1.081.
Importance of parental involvement: Mean = 3.904, SD = 1.099.
Importance of physical environment: Mean = 3.713, SD = 1.072.

Results of statistical analysis of describing the quality of preschool education

Quality of Preschool Education	Mean	SD	Skewness	Kurtosis
QPE1:Teacher-child relationship is crucial for ensuring Quality of Preschool Education	3.992	1.073	-0.982	0.528
QPE2:Quality of Preschool Education depends on Curriculum and Instruction	3.940	1.047	-1.229	1.522
QPE3: Effective leadership, clear communication, and strong management practices that contribute to a well-functioning early learning environment.	3.777	1.050	-0.735	0.381
QPE4:Continuous assessment is very important for the quality of pre-school education, in order to understand each child's development and to adjust teaching practices.	4.016	1.081	-1.105	0.862
QPE5: The involvement of parents is important for the Quality of Preschool Education	3.904	1.099	-0.941	0.545
QPE6: The physical environment is of great importance for the Quality of Preschool Education	3.713	1.072	-0.801	0.510

Analyse the gender, age, educational background, teaching experience and regional differences of preschool teachers

Gender differences

There were no significant differences between male and female preschool teachers in terms of teacher competence, interactive teaching and quality of preschool education.
Teacher Competence: t= 0.313, p > 0.05;Interactive Teaching: t= 0.785, p > 0.05；
Quality of Preschool Education: t = 0.776, p > 0.05

Age Differences

Significant age-related differences exist in preschool teachers' perceptions across various dimensions.These findings highlight the impact of age on preschool teachers' perspectives in these areas.Learning Environment: F = 7.198, p < 0.001;Teacher Competence: F = 8.042, p < 0.001;Interactive Teaching: F = 4.515, p = 0.002;School inspection: F = 7.550, p < 0.001 Quality of Preschool Education: F = 5.996, p < 0.001

Educational Backgrounds Differences

Preschool teachers from different educational backgrounds show significant differences in their perceptions on several dimensions.Learning environment: F = 7.263, p < 0.001;Teacher competence: F = 7.642, p < 0.001;Interactive teaching: F = 7.232, p < 0.001; School inspection : F = 6.449, p < 0.001;Quality of pre-school education: F = 2.816, p = 0.026.

Teaching Experience Differences

Preschool teachers with different teaching experience show significant differences in their perceptions on several dimensions.Learning environment: $F = 8.638$, $p < 0.001$;Teacher competence: $F = 4.695$, $p = 0.001$;Interactive teaching: $F = 2.272$, $p = 0.062$ (almost significant) School inspection: $F = 5.886$, $p < 0.001$;Quality of pre-school education: $F = 4.432$, $p = 0.002$.These results emphasise the influence of teaching experience on preschool teachers' perspectives in these areas.

Regional Differences

There were significant regional differences in the learning environment. ($F = 2.602$, $p = 0.076$). However, there were no significant differences between teachers from different regions in terms of teacher competence ($F = 0.959$, $p > 0.05$).In the perception of interactive teaching, there was no significant difference between preschool teachers in different regions ($F = 0.607$, $p > 0.05$). There were significant differences in the perception of school inspection between teachers from different regions ($F = 2.603$, $p = 0.076$). There were significant differences between preschool teachers from different regions regarding the quality of preschool education ($F = 2.503$, $p = 0.084$).

Comparative analysis

	Age	Teacher qualification	Teaching experience	Regional	Gender
Learning Environment(LE)	F = 7.263 p < 0.001	F = 7.263 p < 0.001	F = 8.638 p < 0.001	F = 2.602 p = 0.076	t = -0.181 p > 0.05
Teacher Competence(TC)	F = 8.042 p < 0.001	F = 7.642 p < 0.001	F = 4.695 p = 0.001	F = 0.959 p >0.05	t= 0.313 p > 0.05
Interactive Teaching(IT)	F = 4.515 p = 0.002	F = 7.232 p < 0.001	F = 2.272 p = 0.062	F = 0.607 p >0.05	t= 0.785 p > 0.05
School Inspection(SI)	F = 7.550 p < 0.001	F = 6.449 p < 0.001	F = 5.886 p < 0.001	F = 2.603 p = 0.076	t= -0.830 p > 0.05
Quality of Preschool Education (QPE)	F = 5.996 p < 0.001	F = 2.816 p = 0.026	F = 4.432 p = 0.002.	F = 2.503 p = 0.084	t = 0.776 p > 0.05

Correlation Analysis

In the present study, the Pearson correlation method (r) was used. In general, a value of r closer to 0 indicates a weaker linear relationship. A positive r indicates a positive correlation, while a negative r indicates a negative correlation. Statistical significance is indicated by a P value, where $P < 0.05$ indicates a significant correlation between the variables.

The table shows significant positive correlations between different aspects. There is a significant positive correlation between the learning environment and the quality of preschool education ($r = 0.484$, $p < 0.01$). This suggests that improvements in the learning environment are associated with improvements in the quality of preschool education. Similarly, there is a significant positive correlation between teacher competence and preschool quality ($r = 0.613$, $p < 0.01$), suggesting that improved teacher competence is associated with improved preschool quality. Interactive teaching also shows a significant positive correlation with preschool quality ($r = 0.431$, $p < 0.01$), suggesting that better interactive teaching methods are associated with better preschool quality. There is also a significant positive correlation between supervision and evaluation and preschool quality ($r = 0.583$, $p < 0.01$), suggesting that effective supervision and evaluation processes contribute to

improving preschool quality. These findings underline the interrelatedness of these factors and show how they contribute to improving the overall quality of preschool education.

Results of correlation analysis

	Learning environment	Teacher competency	Interactive teaching	School inspection	Quality of preschool education
Learning environment	1				
Teacher competency	0.499**	1			
Interactive teaching	0.360**	0.419**	1		
School inspection	0.536**	0.725**	0.410**	1	
Quality of preschool education	0.484**	0.613**	0.431**	0.583**	1

Regression Analysis

Multiple linear regression analysis was used to assess the influences of the learning environment, teacher competence, interactive teaching and supervision and evaluation on the quality of pre-school education. In the model summary, it is noteworthy that the R-squared (R2) value is 0.459. This means that the combined effects of the learning environment, teacher competence, interactive teaching and supervision and evaluation can account for 45.9% of the variation observed in the quality ratings of preschool education. Overall, the model has a commendable level of explanatory power.The ANOVA results for the model show an F-value of 52.185 ($p < 0.001$), indicating a significant linear relationship between the independent variables and the dependent variable within this study.

Each predictor has a significant impact on the quality of preschool education:
The SD coefficient for the learning environment on the quality of preschool education is 0.159 ($p < 0.01$), which means that the learning environment has a significant and positive influence on the quality of preschool education.
Teacher competence has a SD coefficient of 0.325 ($p < 0.01$), indicating a significant and positive impact on the quality of preschool education.
Interactive teaching has a SD coefficient of 0.156 ($p < 0.01$), underlining its significant and positive role in influencing the quality of preschool education.
The SD coefficient for supervision and evaluation on the quality of preschool education is 0.197 ($p < 0.01$), confirming a significant and positive relationship between supervision and evaluation processes and the quality of preschool education.

Regression analysis result

Model		Unnormalized Coefficient	Standard Error	Standardization Coefficient	t-Value	Significance (p-value)	R	F
1	Constant (intercept)	1.099	0.198		5.537	0.000	0.459	52.185 ***
	Learning environment	0.139	0.050	0.159	2.783	0.006		
	Teacher competency	0.319	0.069	0.325	4.624	0.000		
	Interactive teaching	0.117	0.040	0.156	2.951	0.003		
	School inspection	0.162	0.059	0.197	2.750	0.006		

Qualitative Data Analysis

In the open coding phase , 83 reference points were created by coding 9 interview texts using NVivo 12.0 software, thus extracting 9 initial categories as shown in the table(see below).The 15 categories were defined as C1: Infrastructure and equipment, C2: Toys, C3: Human environment, C4: Communication and comprehension, C5: Managerial competence, C6: Pedagogical competence, C7: Observation of Needs, C8: Improvement of Participation, C9: Development of Critical Thinking, C10: Role of Assessment Agencies, C11: Impact on Schools, C12: Impact on Order of Teaching and Learning, C13: Improvement of Teachers' Work Environment, C14: Enhancement of Quality of Teaching and Learning, and C15: Understanding of Teachers by the Society.

Open coding	Reference point	Original Interview text
C1: Infrastructure and equipment	10	The equipment, including teaching tools and classroom furniture, is excellent and ample. The whiteboard setup is also impressive. Our kindergarten boasts a spacious building spanning over 6,000 square meters, and its layout is well-thought-out with designated play areas for children. <Interview text\\CXL>
C2: Toys	5	Due to budget constraints, we rely on limited resources for teaching materials, including DIY solutions and small purchases. Additionally, a significant source of materials comes from parents who donate or provide old toys. <Interview text\\YXL>
C3: Cultural environment	9	But I think our kindergarten is still very good in this kind of atmosphere, I feel that everyone's mind is still on teaching and everyone is relatively structured, not very concerned about some small things. <Interview text\\DW>
C4: Communication and understanding skills	10	First of all, he must understand the psychological characteristics of children ah, well, this is the most most basic, because only in the understanding of children's situation, he can make the correct way of some educational methods. <Interview text\\GYG>

C5: management capability	3	Now that I'm a classroom head teacher, I feel like there's just so much to do, that you have to take everything into account, every aspect of it. <Interview text\\LQY>
C6: Instructional design and organisation	8	For example, the methodology, the teaching methodology, you, for example, uh, need to have some stories, or with the help of some situations, create a situation that children can understand that kind of situation. <Interview text\\LYH>
C7: Observation	2	I think the teacher should be a good observer, that is to say, a guide, a supporter, I think it is probably more important, not the traditional kind of teacher, you only need to be able to dance, sing, but I think the core of the most basic thing is to be able to like each child. But I think the core and most basic thing is to be able to like children, to be able to read and understand each and every child. <Interview text\\DW>
C8: Improving participation	8	I feel that in classes where we have project-based activities, there is definitely a need for more participation and interaction, whereas in classes where there is no project-based curriculum, there may be some regular activities that are carried out. There is a need to use games to engage the children in the teaching. <Interview text\\YK>
C9: Cultivating Critical Thinking	5	It's just that now this kind of thematic enquiry is something that kids kind of think critically more than before, but it's not fully unleashed yet because maybe the teacher, because the teacher's ability to do it, well, the teacher's also in the process of learning how to do it. <Interview text\\CXL>
C10: Effectiveness of school inspection	7	Supervision is just a walk in the park, is an emergency, that is, for example, today um said, for example, the higher-ups come to our school. If the researcher from the teacher training school comes to supervise, I think there is still a certain guidance, some specific comments, but if the other Ministry of Education, for example, comes to supervise, it is purely to say that ah, through the leadership to understand our school. <Interview text\\GYG>
C11: Impact on school improvement	3	The staff of the evaluation team are not responsible, have they reviewed the information carefully, if they have not reviewed the information carefully, if they have gone through the process, they may not look at it carefully, and then the feedback on the work of the kindergarten will not be very truthful. They will not be able to give good feedback to the kindergarten so that the kindergarten can make better improvements. It still depends on the level and attitude of the panel of experts. <Interview text\\YK>
C12: Impact on teaching and learning	5	I don't feel like it's useful because he comes and says, anyway, that's how your lesson was bad and how it was like, oh, that's how his feedback doesn't improve my thinking about teaching. If there's a problem with some session and he tells you about it, you know what you should do in the future for that session, and it's a little bit useful for classroom sessions sometimes. <Interview text\\ZYY>
C13: Improvement of teachers' working environment	9	I think it should be agreed by the management first and then passed down to us, instead of them not even agreeing on it yet, they tell us first, you guys do it first, and then they are agreeing on it later on, and after agreeing on it then they come back to you the teacher and say that it has to be changed, and I think that this kind of management is irritating, and this is what it boils down to here is just the way that they are managed. The first one is the teachers' welfare package, the second one is the way they are managed, and what about the other aspects? I think the curriculum can actually go and introduce some of that. <Interview text\\YK>
C14: Enhancing the quality of teaching	11	You simply don't have the time, he assigns you a lot of other things so that you simply don't have the time to focus on the quality of teaching, that is, you would have wanted to do that in terms of teaching and learning or in terms of some of the affairs of the class, but the school he may have some of his requirements, ah, some of his sudden to make you work overtime ah, to do all these, to do a lot of, a lot of things. <Interview text\\ZYY>
C15: Societal understanding of teachers	3	There are still some in society, just some who don't understand the teacher. I think it is unfair for preschool education, that is, we will think that our teachers, have engaged in education, or some people will think that we are babysitters, there is no real respect for teachers or recognition of teachers. However, I have also seen some, that is, most of them can still understand the teacher, support the teacher. <Interview text\\CXL>

Spindle-type Coding

In order to better understand the open coded initial categories obtained in the first stage, their attribute properties and relationships with each other need to be analysed in depth and

constantly compared and analysed. By following certain logical relationships, the initial categories are further categorised to form more abstract main categories. The main axial coding process in this paper resulted in the formation of five main categories, namely: B1: overall kindergarten environment, B2: teacher competence, B3: the current situation of interactive teaching, B4: the impact of supervision and evaluation on preschool education, and B5: improvement of the early childhood education system.

Spindle type coding results

Spindle-type coding	Reference point	Open Codes	Reference point
B1: Learning environment	24	C1: Infrastructure and equipment	10
		C2: Toys	5
		C3: Cultural environment	9
B2: Teacher competency	21	C4: Communication and understanding skills	10
		C5: Management capability	3
		C6: Instructional design and organisation	8
B3: Current situation of interactive teaching	15	C7: Observe children	2
		C8: Improving participation	8
		C9: Cultivating Critical Thinking	5
B4: Effectiveness of school inspection	15	C10: Effectiveness of school inspection	7
		C11: Impact on school improvement	3
		C12: Impact on teaching and learning	5
B5: Improvements in the preschool education system	23	C13: Improvement of teachers' working environment	9
		C14: Enhancing the quality of teaching	11
		C15: Societal understanding of teachers	3

Conclusion

Based on the research, the preschool learning environment is generally rated as moderately positive with some variability. Personal care practices, activities and interactions with caregivers/teachers show more variability, while collaboration with parents receives consistently positive feedback. Safety/protection measures and support for language development are seen as positive aspects. Preschool teachers excel in various roles, including understanding of child development, curriculum design and communication.

While there is some variability in their performance, they consistently show strengths in promoting inclusivity and commitment to professional development. In terms of interactive teaching, the means and standard deviations indicate moderate to high performance (means 3.7 to 3.8). These findings suggest effective dimensions of teaching, but further analysis and interpretation is needed to assess the full impact of interactive teaching methods and to identify areas for improvement. Preschool teachers stress the importance of school inspection and related factors in maintaining the quality of early childhood education.
Their evaluations vary, but they highlight inspection criteria, frequency/methods, public reporting, professionalism of inspectors and feedback mechanisms for improving the quality of preschool education.

In addition, these teachers highlight different factors in ensuring high quality early childhood education. Although the ratings vary somewhat, they highlight the teacher-child relationship, curriculum and teaching methods, effective leadership and management, continuous assessment, parental involvement and the physical environment as key components of quality preschool education.

Contribution
The research findings provide valuable insights into different aspects of preschool education and its quality. They show that the learning environment has a significant impact on the quality of preschool education, emphasis the need for educators to create supportive and enriching learning environments. Teacher competence plays a crucial role in improving the quality of preschool education, highlighting the importance of teacher training and continuous professional development. Interactive teaching methods have a positive impact on the quality of preschool education and contribute to better learning outcomes for young children.

Effective monitoring and evaluation processes are associated with better quality of preschool education and provide guidance to educational institutions and policy makers on how to implement robust evaluation mechanisms. Age-related differences in teachers' perceptions suggest the need for tailored training and support program for different age groups of educators. Differences in perceptions between teachers from different educational backgrounds highlight the importance of tailored professional development and training (Hossain et al., 2023).

Teaching experience influences teachers' perceptions, particularly in relation to the learning environment and teacher competence, and guides mentoring and support program for novice teachers (Javed et al., 2020; Al Qalhati et al., 2020. Regional differences in perceptions highlight the importance of taking regional contexts into account in the development of educational policies. Positive correlations between different aspects underline the interrelatedness of factors that shape the quality of preschool education. Identified predictors, including the learning environment, teacher competence, interactive teaching and supervision/evaluation, guide resource allocation and improvement efforts.

In summary, these findings provide a comprehensive understanding of the factors influencing the quality of preschool education and offer valuable insights for educators, policy makers and researchers to improve early childhood education programs and practices.

Recommendation

Provide targeted training and guidance for preschool teachers of different ages, educational backgrounds, teaching experience and regions. Recognize and address the significant age-related differences in the perceptions of preschool teachers. Consider providing targeted training or professional development opportunities to bridge these gaps and ensure consistency in perspectives across age groups. Consider creating a menu of training topics and allowing teachers to choose those most relevant to their age group.

Provide differentiated training to meet the needs and preferences of different age groups. For example, younger teachers may prefer interactive workshops, while older teachers may prefer self-paced online courses. Training and supporting the development of teachers from different educational backgrounds requires a tailored approach to meet the different needs and experiences of educators (Hossain et al., 2018). Provide basic courses for teachers with minimal educational qualifications, focusing on pedagogical foundations and subject knowledge. Provide advanced courses for teachers with higher educational qualifications, focusing on innovative teaching methods, curriculum development and educational leadership. Pairing teachers with mentors or colleagues with similar educational backgrounds who can provide guidance and support.

Improving the competence of teachers is key to improving the quality of education. Priorities the development of pedagogical skills and subject knowledge to ensure a well-rounded competence. Provide consistent coaching and constructive feedback to help teachers refine their teaching techniques. Cultivate a culture of peer learning where teachers can observe and provide valuable feedback to their colleagues. Motivate teachers to pursue advanced degrees or certifications related to education or their specific subjects. Provide financial incentives or support for their continuing education. Improving teacher competence is a continuous journey that requires structured training, ongoing support and an unwavering commitment to lifelong learning. When teachers continually improve their skills and knowledge, students benefit from a higher quality education.

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