

## Impact of Play-Based Learning among Preschool Children: A Case Study in the Province Punjab, Pakistan

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### Abstract

This case study examines the impact of play-based learning on the holistic development of preschool children in the Gujrat district of Punjab, Pakistan. The study employs a one-way analysis of variance (ANOVA) to assess children's development across seven dimensions: personal and social, languages and literacy, basic mathematics, physical play, creative art and scientific play, poems and stories, and play in different subjects' corners. Twelve schools representing various types, including provincially-administrated public model schools, private schools, rural public-private partnership schools, and federally-controlled schools, were selected using a two-stage cluster sampling technique. The study collected data on 360 ECE students' growth in various dimensions over two semesters through school administrators, teachers, and parents. The study considered students' overall performance as the independent

variable and their marks/grades as the dependent variable. The hypothesis tested (oHI) was that students would achieve better results, and there would be a significant difference in children's attained marks through play-based learning. The study also determined parents' involvement in children's activities and the impact of their economic status on children's performance.

**Keywords:** Learning, Preschool, Children, Case Study, Punjab, Pakistan

## Introduction

Early childhood education has significant impacts on the holistic development of a child. Play-based learning has emerged as a popular educational strategy for promoting children's development in several areas in recent years. Studies have shown that early experiences significantly affect an individual's success later in life, and those ECE classes, where kids spend most of their preschool years, significantly affect child development. Early childhood education is crucial as it shapes children's development from 0-6 years. Early childhood education is vital as it shapes children's development from 0-6 years. Children are cared for throughout their first three years in various locations, including kindergartens and daycare facilities, but particularly at home. Preschool education programs encourage children's development from ages 3 to 6. Preschool education in Pakistan is often provided through public and private independent playschools (for children 3-5 years old) or playschools housed inside schools (for children 3.5-6 years old). Preschool education has short- and long-term effects on children and society, as early childhood development is a cornerstone of social development. In a child's educational journey, their physical and social surroundings significantly impact their growth. To enhance the conditions of the physical environment, designers can seek optimal design solutions that influence the holistic development of children in their educational settings. In a study conducted at ECE schools in Gujrat, Preschool students can learn about children's holistic requirements through the physical environment in ECE classes.

The impact of play based learning on students holistic development of children assessed by analyzing their results under different domain is most important for further improvements and continuity of this program. Preschool education is the process through which youngsters leave the safety zone of their family to enter a more extensive social network. A good education helps a child's intellectual, social, physical, and emotional growth (Cirhinliolu, 2001). The period spanning from birth to six years of age is an incredibly fast-paced phase of physical, intellectual, and social growth. Children acquire fundamental motor skills during preschool years as part of physical development.

Furthermore, this is when personality, social awareness, and creativity emerge. It is crucial to recognize that the growth process during this period holds significant importance for the years ahead. Studies have shown that 60-70% of learning capacity is acquired during this time (Bilgin, 2006; Başal, 1998; Berk, 2003; Poyraz & Dere, 2001).

In recent years, preschool education has gained popularity and prominence. Many factors have contributed to the increased demand for preschool education, such as the proportion of working women, the value of early childhood education for the future of society, the desire of parents to give their children a better start in life and school, and the realization of the long-term advantages of high-quality early childhood programs (Wortham, 2003). Given that, today's children spend most of their time in school buildings, and that interest in early childhood education has grown, the design elements of such facilities will undoubtedly become increasingly relevant based on their influence on child development.

Research has shown that the physical surroundings at educational facilities greatly influence children's behavior. Children's learning depends just as much on their interactions with the physical environment as on their everyday interactions with others (Maxwell, 2007). Nicholson (2005) asserts that infants learn about the world via their senses. Thus, design plays a significant role in infant growth through feeding senses and emotions (Day, 2007). Day goes on to say that sensory input throughout infancy is essential in preparing for maturity, and he expresses displeasure with the contemporary disregard for the value of design.

Walden (2009) emphasizes the importance of stimulating children's senses in educational settings by providing various materials that offer fresh experiences and entertainment possibilities. Meanwhile, Olds (2001) asserts that a well-planned activity program can effectively guide young children in exploring and utilizing items. Preschool education settings, in reality, are places capable of providing children with a wide range of stimuli, both inside and outside. Outdoor play spaces, in particular, have been shown to benefit children's physical health, mental development, and social intelligence (Herrington, 2008). As stated by Dudek in 2000, "a design that gives the child opportunities to discover, develop, and learn" makes a children's facility effective. As a result of offering indoor and outdoor spaces, a well-equipped preschool education facility provides the appropriate physical environment to assist children's growth. Preschool education benefits for kids are essential to short-term and long-term community development. According to Jacques van der Gaag (2006), early experiences would provide significant learning opportunities for a society's long-term growth. Early childhood development offers several short-term benefits across various domains. Mental development can lead to higher IQ, improved practical reasoning, enhanced eye and hand coordination, and increased reading readiness. Additionally, it contributes to better health outcomes by reducing the risk of illness, minimizing digestive disorders, preventing growth inhibition, promoting better hygiene practices, and ensuring access to

healthcare. Furthermore, early childhood development positively impacts social development by fostering a well-developed personality perception, reducing aggression, encouraging interactive play, improving relationships with peers and parents, and enhancing social compatibility.

On the other hand, "human development" and "economic growth" are terms used to characterize the long-term impact of such advances on society. Long-term economic plans must incorporate early childhood development initiatives. Shonkof (2009) contends that early childhood development lays the groundwork for a thriving society. Children with access to high-quality education in their early years are more likely to become productive members of society. Children with access to high-quality education in their early years are more likely to become productive members of society.

In conjunction with the increasing recognition of the significance of early childhood education, there has been a corresponding rise in the prominence of life-long learning methods. Since the 1990s, there has been a growing emphasis on the importance of continuous learning for social development. This strategy has necessitated the restructuring of education systems, the allocation of more resources toward education, and the implementation of legislative laws in diverse nations. The objective is to educate individuals on strategies to perpetuate lifelong learning. It is essential to recognize the importance of the preschool years in human development. Consequently, this framework's endorsement of preschool education is a crucial objective. Enhancing education's quality and impact is widely acknowledged as the fundamental basis for adopting a lifelong learning strategy, thereby attributing it significantly (DPT, 2009).

There is a debate on the effectiveness of different educational models. The Single National Curriculum (SNC) claims that all models have similar outcomes. This study investigates the impact of play-based learning on preschool children's academic performance and development.

### **Literature Review:**

Early Childhood Education (ECE) is essential for the comprehensive development of children, influencing their cognitive abilities, character, social interactions, and physical development. Studies indicate that the brain undergoes substantial development until the age of five, underscoring the significance of a well-rounded home and societal environment (Rollick, 2004; Woodhead, 2006). Early Childhood Education (ECE) is crucial for establishing the fundamental basis for continuous learning and cultivating positive dispositions. Insufficient early development can have a negative impact on long-term cognitive abilities, skills, and even physical well-being (Mustard, 2002).

UNESCO and other international organizations acknowledge the significance of Early Childhood Education (ECE) and promote the principles of high standards, fairness, and effectiveness in early schooling. The "Education For All (EFA)" initiative and the World Education Forum Dakar have established objectives to enhance and broaden early childhood education (ECE), with a particular focus on vulnerable and underprivileged

children (UNESCO, 1990; 2000). Early Childhood Education (ECE) is widely recognized as a fundamental aspect of human development, where well-designed programs that focus on family and community culture have a substantial impact on a child's holistic growth (Myers, 1992).

The ECE also emphasizes the social and economic advantages, explicitly emphasizing the enhancement of quality and the development of skills. Heckman (2000) and Heckman & Masterov (2004) observe that early childhood education (ECE) plays a significant role in promoting economic growth at both the national and global levels by improving skills and investing in human capital. Nevertheless, there are still obstacles to overcome, such as the absence of significant links between children's home environment, early childhood education, and academic abilities (Singh, 1995). The curriculum of the EFA seeks to tackle these challenges by offering comprehensive development, promoting civic engagement, and prioritizing learning through play (Early Childhood Education curriculum - 5; Ministry of Education - 2007).

The Ministry of Education (MoE, 2003) emphasizes the significance of project-oriented and activity-based curricula in early childhood education (ECE) to enhance creativity and cognitive development. UNESCO highlights the importance of early education in addressing poverty and attaining the goals of Education for All (EFA) and the Millennium Development Goals (MDGs). It emphasizes the significance of a stimulating learning environment for children's educational development (Kizlik, 2009; UNESCO, 2007).

Ultimately, Early Childhood Education (ECE) is widely acknowledged on an international scale for its crucial contribution to the development of children from birth until they reach the age of mandatory schooling. It establishes a basis for the cultivation of problem-solving abilities, social interaction, and holistic growth (European Edu.; Cirhinlioglu, 2001).

#### HISTORY OF ECE IN PAKISTAN

Pakistan's Early Childhood Education (ECE) has undergone different stages and encountered numerous obstacles throughout its history. In the early 1970s, educational courses for children between the ages of 3 and 5 were introduced. However, they were not explicitly focused on Early Childhood Education (ECE) and were later terminated due to political complications. These classes were designed to equip children with the necessary skills for formal primary education. However, they did not require a formal enrollment process, resulting in a lack of records for enrolled students.

In 1992, the establishment of "Katchi" classes in the public sector was officially initiated. However, the program encountered difficulties in implementation due to inadequate educational facilities, insufficient infrastructure, and the absence of age-appropriate educational methods. Merely 10% of the specified demographic was registered for these courses. Montessori approaches were primarily accessible to children from affluent families, as the private sector embraced them.

In the late 1990s, the population of children under five in Pakistan accounted for 14.2% of the total population, highlighting the urgent requirement for investment in early childhood education. In light of this, the Government of Pakistan, dedicated to the World Declaration on the Survival, Protection, and Development of Children, launched the National Plan of Action (NPA) in 2003. This plan designated Early Childhood Education (ECE) as a fundamental domain, with a specific emphasis on enhancing the availability, persistence, and prospects of young children.

Since its inception at the inaugural Education Conference in November 1947, ECE has been acknowledged as a significant field. The conference's primary and secondary committees incorporated measures for pre-primary education, thereby paving the way for government intervention in the establishment of nursery schools. The age range designated for early childhood during this period was 3-6 years. This historical overview emphasizes the changing characteristics and increasing acknowledgment of the significance of Early Childhood Education (ECE) in Pakistan's national policy.

### **Methodology:**

The study employs a case study design and focuses on preschool children in the Gujrat district of Punjab, Pakistan. The participant selection process was conducted with utmost care and precision, utilizing a meticulous two-stage cluster sampling technique to ensure accuracy and reliability. The first stage involved selecting the Gujranwala division from the nine administrative Divisions of Punjab. The first stage of the selection process involved choosing one administrative division out of the nine available in Punjab. For this objective, the Gujranwala division was the chosen location. Specifically, out of the six districts in the Gujranwala division, the Gujrat district was selected in the subsequent phase. Each step of the process was executed with precision and scrutiny to guarantee the highest level of quality. Three schools, one from each Tehsil (Gujrat, Kharian, and Sarai Alamgir), were selected from different categories in Gujrat.

1. Provincially administrated public model primary school, offering ECE classes run by the MoE Punjab, catering to children from low and middle-class backgrounds.
2. Private schools registered under the MoE Punjab have been operational for over ten years, serving children from upper- and middle-class environments.
3. Rural public and private partnership schools have ECE programs under the control of the Punjab Education Foundation (PEF), which the MoE Punjab runs, has operated for more than five years, and serves children from middle- and lower-class backgrounds.
4. Federally-controlled schools in each Tehsil (Gujrat, Kharian, and Sarai Alamgir), established for more than fifteen years, catering to children from professional to middle and upper economic backgrounds, were selected using a lottery method where applicable.

### **Sample size;**

The study included a total of 12 schools. We took great care in collecting data by administering questionnaires to school teachers/principals and parents of ECE children. The questionnaires assessed children's holistic development across the seven dimensions

and gathered information about implementing play-based learning in the selected schools. A ratio of One-third of parents were selected for assessment of the economic conditions of parents.

The total sample size for assessments of students' results was found to be 360(calculated=323+37 @ 10% nonresponsive) as per the formula:  $n = z^2 * p * (1 - p) / e^2$

Where:  $z = 1.96$  for a confidence level ( $\alpha$ ) of 95%,  $p =$  proportion (expressed as a decimal),  $e =$  margin of error.

The QAED Gujrat recorded a total population of 2000, including the 70 schools established for ECE education. Of these, 67 schools met the requirements, while 3 lacked preschool prerequisites. In addition, until 2015, 3 Federal schools and 378 private schools were registered under the provincial government.

**Data analysis method;**

The observation results contained two parts of the assessment, namely table A = first term assessment, table B = B=second term assessment, and ANOVA used for holistic development as a variance under seven dimensions. The observation criteria also consider the effect of the socioeconomic conditions of parents of preschool children on children's holistic development.

The observation results of students used the following marks/Grading criteria:

Teachers	n	%
<b>Teaching Experience</b>		
0 – 5 years	3	25
6 – 10 years	7	58.33
11 – 15 years	2	0.08
<b>Experience with Preschool Children</b>		
0 – 5 years	6	50
6 – 10 years	3	25
11 – 15years	3	25
<b>Assessment related to the ECE course</b>		
Yes	12	100
No		
<b>Level of Education</b>	-	-

12 years Education	1	0.1
Bachelor's degree education	6	50
Masters education years	4	25
Higher studies	1	0.1
<b>ECE course</b>		
Yes	12	100
No	-	-

Table 1 shows the distribution of teaching experience, educational background, and course participation among 12 respondents:

About 25% of responders have 0–5 years of teaching experience. 58.33% have taught for 6–10 years, a considerable rise. Only 0.08% have 11–15 years and 16+ years experience. Focusing on preschool teaching experience modifies the pattern. 50% of responders have 0–5 years of experience. The ratio of individuals with 6 to 10 years of experience reduces to 25%, matching those with 11 to 15 years. Like overall teaching experience, only 0.08% have been teaching preschool for 16 years or more. Educational qualifications have changed drastically. The majority of respondents (50%) have a Bachelor of Education. 4% of respondents have a Master's degree, and 0.1% have 12 years of schooling or more. 100% of respondents took Early Childhood Education courses. Additionally, 100%



participation in assessment-related courses and ECE-related courses demonstrates a total focus on this subject among respondents.

Results:

Table 2

Comparison of Mean Scores for Different School Types in the 1st Term

Schools	N	Mean	SD
Private school	3	14.27	0.72
Federal schools	3	14.70	1.00
PEF schools	3	13.44	1.20
Public schools	3	13.94	0.74
<b>Total</b>	12	14.09	0.93

Note. Mean scores are based on the first-term performance of students. SD = Standard Deviation. PEF = [Punjab Education Foundation].

Table 2(a)

Analysis of Mean Scores and Post-hoc Comparison (Tukey HSD) Among Different School Types in the 1st Term

ANOVA Summary

Source	Sum of Squares	df	Mean Square	F
Between Groups	2.536	3	.845	.969
Within Groups	6.982	8	.873	-
Total	9.518	11	-	-

Post-hoc (Tukey HSD)

Schools	N	Mean	Sig.
PEF schools	3	13.44	.407
Public schools	3	13.94	

Private school	3	14.27	
Federal schools	3	14.70	

Note. Mean scores are based on first-term performance.

Tukey HSD is used for post-hoc comparisons.

**Results:**

The study conducted an ANOVA to examine the correlation between academic performance and overall child development across various school types. Mean scores from private (14.27), federal (14.70), PEF (13.44), and public schools (13.94) indicated academic success. In the first Term, the ANOVA results showed no statistically significant relationship between academic performance and overall child development. The F-value obtained from the analysis was 0.969, with degrees of freedom (3, 8). Post-hoc comparisons using Tukey's Honestly Significant Difference (HSD) test revealed no significant differences between specific pairs of school types (PEF, Public, Private, and Federal schools) based on their mean scores ( $p = 0.407$ ). The null hypothesis, which holds that students do better and that there is a substantial difference in the grades obtained by children through play-based learning, is thus not denied based on these data. The alternative hypothesis contends that while students perform better, there is no significant distinction in the grades obtained through play-based learning. These findings imply that factors other than academic achievement may impact children's general development in these schools.

**Table 3**

**Comparison of 2nd Term Mean Scores for Different School Types**

Schools	N	Mean	SD
Private schools	3	17.62	0.49

Federal schools	3	17.82	0.39
PEF schools	3	16.96	0.38
Public schools	3	17.32	0.93
<b>Total</b>	12	17.43	0.61

Note. Mean scores and standard deviations (SD) are based on second-term performance.

**Table 3(b)**

**ANOVA Summary and Tukey HSD posthoc Comparison of 2nd Term Grades Among School Types**

ANOVA Summary

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.252	3	0.417	1.188	0.374
Within Groups	2.811	8	0.351	-	-
Total	4.063	11	-	-	-

Tukey HSD Comparison

Schools	N	Mean	Sig.
PEF schools	3	16.96	0.352
Public schools	3	17.32	
Private schools	3	17.62	
Federal schools	3	17.82	

Note. Tukey HSD is used for post-hoc comparisons.

**Results:**

The study employed ANOVA to investigate differences in academic performance and child development among various types of schools. The mean scores for academic performance were as follows: private (17.62), federal (17.82), PEF (16.96), and public (17.32) schools. The ANOVA results indicated no significant correlation between academic performance and overall child development in the second semester. The F-

value obtained from the analysis was 1.188, with degrees of freedom (3, 8). Subsequent Tukey HSD post-hoc tests, comparing mean scores among PEF, Public, Private, and Federal schools, also found no significant differences between these groups ( $p = 0.352$ ). This suggests that the observed differences in mean scores among the various school types were not statistically significant.

As a result, we cannot reject the null hypothesis that there is no significant difference in the marks attained by children through play-based learning, indicating that students have similar results. Conversely, the alternative hypothesis proposes that students have achieved outcomes, but the marks achieved through play-based learning are the same as those achieved through other teaching methods. These findings imply that academic performance alone may not be the sole determining factor in the overall development of children across these types of schools. Further investigation is required to explore other potential influences on child development within the educational setting.

### **Effect of socioeconomic condition of parents;**

The setting of preschool programs we have described has developed naturally, rather than deliberately, in response to the shifting demographics of the children and families who benefit from early education. This system must aid low-income children from diverse backgrounds to catch up to their more privileged peers. In addition, the existing system cannot accommodate the increasing number of children and families from diverse language and cultural backgrounds. These children face impossible challenges caused by cultural and language differences as well as insufficient family resources, which cause the gaps between home, preschool, and primary school to be infinite. This section raises concerns regarding this ecology's ability to support and promote the developmental growth of children and families that will soon be a part of it by outlining some of its features. Studying early childhood education aims to bridge skill gaps in low-income households. Children who live in low-income homes need more money for housing, food, clothing, books, educational materials, high-quality child care and early education, or health care (Duncan & Brooks-Gunn, 1997; Sewell & Hauser, 1975). As a result, they often have a hard time growing up (Duncan & Brooks-Gunn, 1997; Sewell & Hauser, 1975). When we look at the data that describes current situations and predicts what will happen, it is clear that the preschool landscape will be under much stress; this includes the connections between child care, preschool, and schools, the connections between families and adults who teach their children, and the abilities of the "system" to help children who are becoming more different in terms of race, culture, language, and economic background develop positively. The stresses in the environment and relationships among children and families can hinder healthy development in preschools.

Respondent (Parents) Demographics;

Items found in the respondent's demographic section were experience with preschool children, social and financial status, education level, knowledge about early child education and providing material related to ECE.

**TABLE 4**

Demographics of Respondents

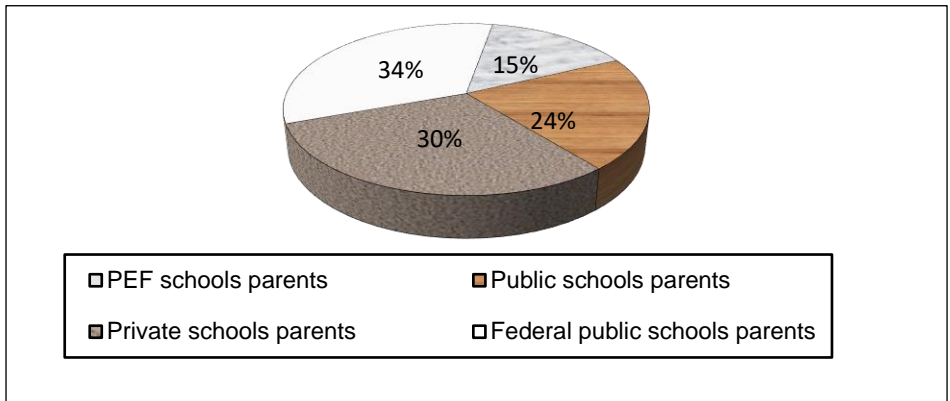
<b>PARENTS</b>	<b>n</b>	<b>%</b>
<b>Experience with Preschool Children</b>		
0 – 5 years	62	50.4
6 – 10 years	50	40.6
11 – 15 years	13	10.5
<b>Social Financial status</b>		
10000 – 50000 PKR	30	24.4
60000 – 100000 PKR	63	51.2
100000 – 150000PKR	30	24.4
<b>Knowledge about Early Childhood Education (ECE)</b>		
0 – 5 years	76	61.7
6 – 10 years	35	28.4
11 – 15 years	35	28.4
<b>Level of Education</b>		
12 years Education	23	18.6
Bachelor’s degree education	80	65
Masters education years	20	16.2
<b>Providing Materials Related to ECE at home</b>		
Yes		

	110	89.4
No	13	10.5

TABLE 4 The Demographic segment of the survey, which explicitly targets parents, provides information on various facets of their personal history and participation in early childhood education (ECE). A considerable proportion of the parents, precisely 50.4% (62 respondents), possess yet to gain prior experience with preschool-aged children. In contrast, 40.6% (50 respondents) have six to ten years of experience, and 10.5% (13 respondents) have eleven to fifteen years of experience. Regarding social financial status, a significant proportion of respondents (61.2%; 30 individuals) fall within the income bracket of 60,000 to 100,000. This is followed by 24.4% (30 individuals) who fall within the income brackets of 100,000 to 150,000 and 10,000 to 50,000. In terms of academic attainment, 65% (80 participants) possess a Bachelor's degree, 16.2% (20 participants) hold a Master's degree, and 18.6% (23 participants) have completed 12 years of education. In the same experience brackets, knowledge of ECE is segmented, with 76, 35, and 12 respondents, representing 61.7%, 28.4%, and 0.1% of the total, respectively, in the 0-5, 6-10, and 11-15 years brackets. It is worth mentioning that a substantial proportion, 89.4% (110 respondents), furnish ECE-related materials within their residences, signifying a profound involvement in the early education of their children. Conversely, a mere 10.5% (13 respondents) do not do so.

The assessment results of students, when linked with their economic conditions, are observed in the following pie graph.(Fig1)

Parents of all schools:



FigI:

This pie graph describes that students' economic circumstances directly impact the quality of their education and academic achievement. The observed pattern is consistent across Sarai Alamgir, Kharian, and Gujrat educational settings. Research in these regions has shown that schools primarily serving children from professional to upper-middle-class homes generally have higher academic achievement levels. For example, children at each Tehsil's federally-controlled schools, which have been in place for more than fifteen years, perform at a 34% higher rate than their peers, demonstrating better outcomes, explained by their improved economic circumstances, which often give them access to more significant resources, a welcoming learning atmosphere, and academic enrichment opportunities.

In contrast, private schools in Punjab, officially recognized by the Ministry of Education (MoE) and serving students from middle-class and upper-class families, have a 30% higher success rate. These schools have existed for more than ten years, which may be a symptom of the large sums of money and attention these schools expend on providing high-quality education. Most students enrolled in provincially managed public schools, especially those that provide Early Childhood Education (ECE) programs overseen by the MoE Punjab, come from lower-class to middle-class backgrounds. Compared to other schools in their peer group, these schools show a 24% improvement in results.

Fascinatingly, the Punjab Education Foundation's (PEF) function becomes vital in guaranteeing that children from various economic backgrounds get a high-quality

education. Public model primary schools run by the province that serve students from poor and middle-class households and provide ECE programs have a 15% higher success rate. Additionally, promising results have been seen at rural schools run by PEF and under a public-private partnership that provides ECE programs. Over the past five years, they have improved their academic results, mainly serving middle-class and lower-class students.

In summary, PEF efforts emphasize the significance and effects of organized educational programs and public-private partnerships, even if economic constraints may have a significant influence on academic performance and the quality of education (M Athar al., 2021; Selvitopu et al., M. (2021, December 24)

Play-based learning fosters a solid foundation for children's development by parents actively participating in their educational journey. Encouraging curiosity, creativity, and language proficiency through reading, singing, and rhyming games fosters critical thinking, problem-solving, and social aptitude. Involving children in household activities and fostering social aptitude, empathy, and emotional intelligence contributes to a supportive and nurturing environment, paving the way for a brighter future for their children.

**The play-based facility at home vs. high-scored achievement;**

**Table 4**

High-Scored Achievements Related to Play-Based Facilities at Home across Different Schools:

Schools	Assessment	Range of Score Obtained out of 28 Marks	Play-Based Facilities at Home
Federal schools	First Term Results	13-18	60%
	Second Term Results	15-22	
Private schools	First Term Results	12-18	50%
	Second Term Results	14-21	
Public schools	First Term Results	11-18	35%



	Second Term Results	13-21	
PEF schools	First Term Results	12-17	20%
	Second Term Results	13-18	

Note. This table shows the range of high scores achieved in first and second-term results in relation to the availability of play-based facilities at home for students from various schools.

**Result:**

The data illustrates a compelling correlation between play-based facilities at home and the rate of high-scoring achievements in various types of schools. Federal schools, where up to 60% of children have access to play-based facilities at home, are leading the pack, showing remarkable improvements in student performance. Private schools follow closely, with up to 50% of children having this facility and demonstrating enhanced results, albeit less than federal schools. Public schools must catch up, with only up to 35% of students having access to such facilities at home, which translates to performances lower than those of private and federal institutions. PEF schools, where only 20% of children have these facilities, witness the most minor progress. The findings strongly suggest that students' performance can be significantly enhanced if they are facilitated by parents at home and engaged in activities that mirror the play-based learning environments found in schools. Parents and educators may use these insights to synergize home and school environments, promoting holistic development that aligns with educational objectives.

**Discussion:**

The presented study investigates the impact of play-based learning on the holistic development of preschool children in the Gujrat district of Punjab, Pakistan. The research examines children's academic performance and overall development across different types of schools: provincially-administrated public model schools, private schools, rural public-private partnership schools, and federally controlled schools. The data analysis employs a one-way analysis of variance (ANOVA) to assess children's development in various dimensions and to determine if there is a significant difference in their marks through play-based learning.

The study's findings from the ANOVA tests suggest no significant relationship between academic performance and child overall development for both the first and second semesters across different types of schools. The null hypothesis, which suggests that students perform better and there is a substantial difference in grades attained through play-based learning, is not rejected based on the obtained p-values. The absence of noteworthy variations in academic achievement among different school types (private, federal, PEF, and public) indicates the possibility of uniform implementation of play-based learning in these institutions. This uniformity might contribute to a level playing field in academic performance.

Furthermore, the study also considers the socioeconomic conditions of parents and their impact on children's learning. The data highlights that parents from different school types have varying degrees of involvement in their child's learning. Federal school parents show a higher percentage of involvement (34%) compared to private school parents (30%), public school parents (24%), and PEF school parents (15%). The data showed a correlation between better socioeconomic status and enhanced learning at home and school. This finding highlights how family background and resources shape children's education. Parental involvement in play-based learning fosters development in multiple dimensions, including creativity, language proficiency, critical thinking, confidence, responsibility, and emotional intelligence.

The article also discussed the importance of the physical environment and its role in children's holistic development. The design and quality of indoor and outdoor preschool facilities can significantly impact children's physical health, mental development, and social intelligence.

### **Conclusion:**

In conclusion, the study's findings shed light on the complex relationship between play-based learning, academic performance, overall child development, and parental involvement. The results from the ANOVA tests suggest that while there might be differences in academic performance across different types of schools, these differences may not significantly correlate with children's overall development; this suggests that academic success and socioeconomic factors, teaching methodologies, and school environments influence a child's overall growth.

The uniformity in academic performance across various school types may reflect a standardized approach to play-based learning. While this may ensure equality, it also calls for further exploration into differentiated teaching methods that cater to diverse learning needs.

The significant role of parents' socioeconomic status and the physical environment in children's development emphasizes the need for a holistic approach to early childhood education. The study also underscores the importance of parental involvement in fostering a child's growth and learning. Parents can positively influence their children's development by engaging in activities such as reading, playing creatively, promoting curiosity, and encouraging social interaction. These findings emphasize the need for collaborative efforts between parents and educational institutions to create a supportive environment that nurtures children's cognitive, emotional, and social development.

In the broader context of early childhood education in Pakistan, these insights can guide policymakers, educators, and parents in refining educational approaches and improving the quality of preschool education. The study highlights the importance of complementing play-based learning with comprehensive strategies considering various dimensions of a child's development and involving parents' active participation.

In conclusion, play-based learning is not merely a teaching method but a complex interplay of various factors, including school type, socioeconomic background, physical environment, and parental involvement. A nuanced understanding of these dynamics is essential for leveraging play-based learning to foster children's holistic development. The findings of this study contribute to this understanding and offer a roadmap for future research and practice in early childhood education.

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