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A Prelude to Improving School Education in Punjab, Pakistan

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Abstract

The current study identifies shortages of infrastructure, poor teacher training, rigid curriculum, and gender gaps as the problems that continue to hinder educational progress. A mixed-methods research design was used to collect data from 100 school administrators and 200 teachers in public and private schools in urban, semi-urban, and rural areas. Findings indicate that 62% of the subjects reported poor infrastructure, and 55.5% reported poor teacher training. A positive relationship between teacher training and the performance of the students was established, with students with trained teachers performing 82.9%, compared to 48.3% with untrained teachers. Rigid curriculum was also a major problem, as it constrained the critical thinking and problem-solving ability of the students. Despite the problems, schemes such as the Female Secondary School Stipend Program (FSSP) and Education Voucher Scheme (EVS) have improved school access and female enrollment. The study advises more investment in infrastructure, structured teacher training, competency-based reforms in the curriculum, and the incorporation of digital learning to effect long-term change. The study calls for continued policy intervention and community engagement to address the educational gaps. The study advises future longitudinal research and inter-provincial comparisons to determine the long-term impacts of education reforms in Pakistan.

Keywords: Education Reforms, Punjab, Teacher Training, Curriculum Development, Gender Disparities, Infrastructure, Policy Interventions.



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Introduction

Education is the backbone of a nation's development, the platform for economic development, social cohesion, and individual prosperity. Educationist nations enjoy sustainable development, low poverty rates, and effective mechanisms of governance (UNESCO, 2022). Pakistan, as a developing country, is confronted with ensuring quality education for its citizens. Despite the constitutional assurances of Article 25-A, ensuring free and compulsory education to all children of the ages 5–16 years, the implementation is uneven due to fiscal constraints, administrative inefficiencies, and socio-economic disparities (UNICEF, 2023). Among Pakistan's provinces, Punjab with a population of over 110 million people is the educational hub of the country. Despite having a relatively advanced infrastructure, the quality of school education is a cause of concern, with issues of access, quality, and equality remaining a concern (Government of Punjab, 2023). Punjab, in the last decade, has done a lot in terms of improving the enrollment of schools, with the figure improving from 84.8% in 2011 to 90.4% in 2017 (ASER Pakistan, 2022). Enrollment, however, is no guarantee of quality learning. Evidence points to the fact that a high number of Punjab students fail to achieve the minimum literacy and numeracy competencies expected of them for the level they study (Pakistan Bureau of Statistics, 2023). The Annual Status of Education Report (ASER) 2022 found that only 41% of Grade 5 students could read a Grade 2-level text in the local language of Urdu and the language of instruction, i.e., English, reflecting a critical shortfall in teaching practices and effectiveness of the curriculum (ASER Pakistan, 2022). These harsh realities call for urgent education reforms that extend beyond the increase in enrollment to address teacher development, improvement of the curriculum, students' participation, and development of infrastructure.

One of the most critical issues that Punjab's education sector is currently facing is the lack of infrastructure. A majority of public schools in rural areas lack proper amenities such as clean water for drinking, electricity, functional toilets, and proper classrooms (Pakistan Bureau of Statistics, 2023). In addition, poor quality of teaching and old pedagogy continue to impede the learning of students. Most of the teachers in Punjab lack professional training and practice traditional rote-based learning methods, which repress critical thinking and problem-solving among the students (World Bank, 2023). In addition, the issue of gender remains a critical issue, with several girls out of school due to socio-cultural restrictions, long distances to travel to school, and safety concerns (UNESCO, 2023). In rural areas, economic deprivation also exacerbates the issue, as most families prioritize the labor of children as a more urgent economic need than education (UNICEF, 2023).

To address these issues, the Punjab government has launched several programs to increase the quality of education as well as its access. The Punjab Education Sector Reform Program (PESRP) has taken a central role in improving the school system, teacher capacity development, and infrastructure development (Government of Punjab, 2023). Initiatives to integrate digital learning tools and new pedagogy through the use of digital learning platforms and smart classrooms have also been launched (Pakistan Digital Education Report, 2023; Afzal, Gul & Shahbaz, 2024). In addition, public-private partnerships have also been used to increase educational access in remote areas (World Economic Forum, 2023). Scholarships and stipends to poor families have also been launched to reduce the dropout ratio as well as to increase girls' education (UNICEF, 2023).

Despite all these initiatives, Punjab is still faced with several issues in achieving high-quality education to international standards. More inclusive policy responses that address systemic deficits in the realms of governance, infrastructure, teacher development, and curriculum development are necessary for sustainable progress. This study aims to critically analyze the effectiveness of past

and present education reforms in Punjab, identify the key barriers to quality education, and explore potential solutions to increase the learning achievements and educational equality of the province. Through a review of Punjab's education policies, infrastructure problems, and teaching methodologies, this research presents evidence-based policy advice to policymakers, teachers, and stakeholders. The aim is to facilitate a more inclusive, effective, and high-quality education system that prepares students with the competencies and information to lead Punjab and Pakistan into a better future.

Background of Study

Education is commonly accepted as a primary driver of socio-economic development, economic development, social equality, and individual empowerment. Nations that invest in improving the quality of education and educational reforms experience a dramatic improvement in literacy rates, workforce productivity, and overall economic resilience (UNESCO, 2022). Pakistan's education system is faced with multi-dimensional problems, particularly in the province of Punjab, with access, quality, governance, and socio-economic inequalities issues continuing to hinder the development of an educated society (UNICEF, 2023). Punjab, the most populous province of Pakistan with over 110 million people, traditionally served as the educational hub of the country (Government of Punjab, 2023). Despite massive investment to promote school education, the quality of learning is below par. The province has registered a notable improvement in the increase in school enrollment, with primary school enrollment rising from 84.8% in 2011 to 90.4% in 2017 (ASER Pakistan, 2022). More enrollment, however, is not always a determinant of quality learning, as the surveys indicate that most students do not have proper literacy and numeracy competencies (Pakistan Bureau of Statistics, 2023). Interestingly, only 41% of Grade 5 students in Punjab could read a Grade 2-level text in Urdu or English, reflecting severe inadequacies in teaching methodologies and the effectiveness of the curriculum (World Bank, 2023). These figures indicate the need for targeted reforms in education that extend beyond the increase in access to increase teaching quality, learning participation, and modernized curriculum.

One of the primary barriers to educational progress in Punjab is the poor public-school infrastructure. Current surveys reveal that over 40% of schools lack minimum infrastructure such as functional toilets, access to clean water for drinking, and electricity (Pakistan Bureau of Statistics, 2023). Shortage of classrooms, overcrowding, and a lack of learning material exacerbate the learning crisis, particularly in rural and disadvantaged areas (UNICEF, 2023). The quality of learning is also significantly undermined by the unavailability of professionally qualified teachers. Most of the teachers in Punjab lack proper training in modern pedagogy and continue to practice rote learning methods, which limit the development of the cognitive and reasoning abilities of the students (ASER Pakistan, 2022). Evidence confirms that effective teacher training and professional development programs have a direct relationship with improved performance and learning achievements among students (World Bank, 2023).

Besides infrastructure and teaching quality, socio-cultural and economic barriers also continue to impede the access of children to education, particularly girls. Gender differences continue to remain a long-term issue, with many girls being driven out of school due to safety concerns, social norms, and economic considerations (UNESCO, 2023). In rural areas, children of low-income families end up working as child laborers or performing domestic chores, which diminishes the opportunity of formal education for them (UNICEF, 2023). Evidence of Pakistan's education sector confirms that parental attitudes toward schooling, economic conditions, and the perception that education is irrelevant contribute to high dropout rates among children of disadvantaged groups (Khan, Ahmad, & Malik, 2023). This highlights the need for immediate support programs

such as scholarships, stipends, and free school meals to enhance higher school retention rates (Government of Punjab, 2023).

Noting these issues, the Punjab government initiated various reforms in the education sector, including the Punjab Education Sector Reform Programme (PESRP), with the aims of enhancing the quality of governance, teacher capacity, and school infrastructure (Government of Punjab, 2023). Digital learning programs, including smart classrooms and online learning platforms, have also been initiated to modernize the education system (Pakistan Digital Education Report, 2023; Afzal, Zia & Khan, 2024). Public-private partnerships have also greatly enhanced educational access, particularly in remote and disadvantaged regions (World Economic Forum, 2023).

Punjab remains behind in terms of achieving quality education comparable to international levels despite these reforms. The current study intends to analyze the effectiveness of current reforms in the Punjab education sector, identify the key barriers to progress, and provide sustainable strategies to enhance teaching quality, infrastructure development, and socio-economic inclusivity in the province. Through a review of past and current policy responses, the study intends to contribute to evidence-based policy guidance to improve the quality of education in Punjab. The study findings inform policymakers, teachers, and development agencies in the formulation of a more equitable, high-quality education system in Pakistan.

Research Gap

Despite various attempts to promote education in Punjab, Pakistan, various gaps exist that hinder the achievement of quality and equitable education. One of the most important gaps is the lack of proper integration of critical thinking and analytical competencies into the curriculum. The existing curriculum focuses more on rote learning than the acquisition of critical thinking, thereby limiting the ability of students to use analytical reasoning and problem-solving. Such a practice limits the acquisition of competencies that are important for the 21st century (The City School (Pakistan)). Another gap is the lack of proper professional development of teachers. Most of the teachers lack exposure to modern pedagogical approaches, which limits the delivery of quality teaching and impacts the learning of the students adversely. Such a gap suggests the need for intensive teacher development programs that focus on modern teaching approaches (Education in Pakistan). Further, localized research that examines the unique issues of different districts of Punjab is scarce. Organizations such as the Society of Pakistan English Language Teachers have observed differences in educational performance in different regions, which suggests the need for studies by district to inform targeted intervention (Society of Pakistan English Language Teachers).

Rationale

Closing these research gaps is necessary for a variety of reasons. First, enhancing critical thinking among students is necessary to prepare an innovative and adaptable workforce in a rapidly changing global economy. Through the shift away from rote learning, the education system can produce students better equipped to address complex problems and contribute to the betterment of society.

Second, investment in teacher professional development is central to improving the quality of education. Properly trained teachers with a sound grasp of current pedagogy can create more effective and engaging learning environments, leading to improved learning results and reduced dropouts. Third, localized research allows the creation of localized interventions that target the distinctive needs of different communities in Punjab. Such an initiative ensures that educational reforms are relevant to the local situation and are more likely to succeed in bridging current gaps.

This study aims to fill these research gaps by examining the effectiveness of the existing curriculum in developing critical thinking, examining the status of teacher professional development, and conducting analyses by district to inform targeted educational reforms in Punjab, Pakistan.

Literature Review

Educational reforms worldwide, and particularly in South Asia, have been key to the quality and access of education. The current review of the literature examines various reforms and the impacts of these reforms in various contexts.

International Context

Around the world, a global push to enhance educational gains through new curriculums and significant investment has occurred. For instance, the Happiness Curriculum introduced in Delhi, India, is designed to enhance the mental well-being of students by integrating mindfulness, social-emotional learning, critical thinking, and problem-solving into the school curriculum. The initiative was introduced in 2018 to build decision-making abilities and emotional intelligence among students, beyond academic learning (Afzal, Sami & Munawar, 2024). The curriculum has gained attention for its integrative learning nature, with an emphasis on the centrality of happiness and well-being to learning.

Fiscally, global efforts have tried to fill educational gaps. A new world education funding initiative has been called for by former UK Prime Minister Gordon Brown through the International Finance Facility for Education (IFFEd). The initiative may provide \$1.5 billion in low-cost loans to support education in poor nations, a significant investment in global education amidst widespread budget cuts. The initial funds have been raised through government, corporate, and philanthropic donations, with more than \$100 million already pledged by the Asian Development Bank to be disbursed in 2024.

South Asian Context

South Asian countries have launched a variety of programs to expand educational access and quality. A notable one is India's Sarva Shiksha Abhiyan (SSA), launched in 2001. The initiative is aimed at universalizing elementary education by making it free and compulsory for children in the 6–14 age group. SSA is directed toward opening new schools, adding more classrooms, and provisioning teachers, thereby addressing issues of access and infrastructure. The Rashtriya Madhyamik Shiksha Abhiyan (RMSA), launched in 2009, also targets improving secondary education by enhancing quality and increasing enrollment. RMSA aims to strengthen education quality by improving science laboratories, environmental education, and in-service teacher training. It also emphasizes information and communication technologies (ICT) to acclimate students to digital learning, as digital literacy becomes increasingly essential in education. Non-governmental organizations (NGOs) have also greatly enriched the educational landscape of South Asia. One of India's most prominent NGOs, Pratham, focuses on improving literacy and numeracy among children. Its Annual Status of Education Report (ASER) is a household survey that collects data on children's enrollment status and basic learning achievements in rural districts. ASER has been instrumental in shifting India's educational discourse from focusing solely on enrollment numbers to prioritizing learning outcomes.

Bangladesh's Educational Reforms

Bangladesh has also introduced sweeping educational reforms. Following a revolutionary insurrection in 2024 that deposed Sheikh Hasina's 15-year government, the nation is reevaluating

its historical narratives. Led by interim government head Muhammad Yunus, the country is revising textbooks to downplay Sheikh Mujibur Rahman's role in the 1971 independence movement and to challenge his cult of personality. These revisions aim to provide a more balanced account of history, recognizing other contributors like Ziaur Rahman. However, these changes have faced criticism from former government officials and others who accuse Yunus's administration of distorting history.

Challenges in Educational Reforms

Despite these efforts, challenges persist. In Afghanistan, the return of the Taliban to power has led to severe restrictions on women's education. A Taliban deputy publicly stated that there is no justification for banning Afghan girls and women from education, highlighting internal divisions within the group. These bans have drawn global condemnation and significantly hindered educational progress in the country. Furthermore, the rapid expansion of higher education in developing nations has resulted in an oversupply of graduates, many of whom struggle to find employment. This issue has been observed in countries such as India, China, Mongolia, and nations across Southeast Asia, North Africa, and the Middle East. The problem is worsened by the poor quality of many newly established colleges, which fail to equip students with the necessary skills for the job market, leading to widespread graduate unemployment. Educational reforms in South Asia and across the globe have made notable strides in improving both access and quality. Programs such as India's SSA and RMSA have addressed challenges related to infrastructure and enrollment, while initiatives like the Happiness Curriculum have introduced holistic approaches to student well-being. However, ongoing issues such as educational restrictions in Afghanistan and unemployment among graduates due to the rapid expansion of higher education without sufficient job opportunities highlight the need for continuous policy assessment and adaptation to meet evolving societal needs.

Theoretical Framework

Three theoretical models provide valuable insights into the educational reforms in Punjab, Pakistan: Improvement Science, Systemic Change Theory, and the Context-Input-Process-Output (CIPO) Model.

Improvement of Science

Improvement Science revolves around structured, iterative processes to enhance educational practices. Developed by the Carnegie Foundation for the Advancement of Teaching, this approach focuses on identifying specific issues in educational settings and using continuous cycles of planning, doing, studying, and acting (PDSA cycles) to achieve measurable improvements.

The six key principles of Improvement Science include:

1. Making work problem-specific and user-centered
2. Addressing variations in performance
3. Understanding the systems producing current outcomes
4. Measuring to improve at scale
5. Anchoring practice improvement in disciplined inquiry
6. Accelerating improvements through networked communities

This framework is particularly relevant to Punjab's educational reforms, as it promotes localized solutions and encourages collaborative efforts among educators to tackle unique challenges within schools.

Systemic Change Theory

Systemic Change Theory, as defined by Charles Reigeluth, calls for a paradigm shift from traditional, teacher-centered education to learner-centered systems. Reigeluth emphasizes the need for a comprehensive transformation in educational structures, processes, and cultures to align with society's evolving demands.

His work highlights Personalized, Competency-Based Education (PCBE), which tailors learning experiences to individual student needs and competencies rather than using a one-size-fits-all model. Implementing PCBE requires:

1. Redefining roles in education
2. Restructuring curricula
3. Leveraging technology to support individualized learning paths

For Punjab, adopting Systemic Change Theory could lead to a reassessment of current educational paradigms, fostering more flexible and student-centered learning environments that enhance engagement and learning outcomes.

Integrating Theoretical Frameworks for Punjab's Educational Reform

By integrating these theoretical frameworks, a multidimensional perspective on educational reform in Punjab emerges. Improvement Science offers methodologies for continuous, data-driven improvement, while Systemic Change Theory calls for fundamental shifts toward learner-centered education.

Together, these theories can inform the development of comprehensive strategies to tackle the unique challenges in Punjab's education system, ultimately leading to more effective and equitable educational outcomes.

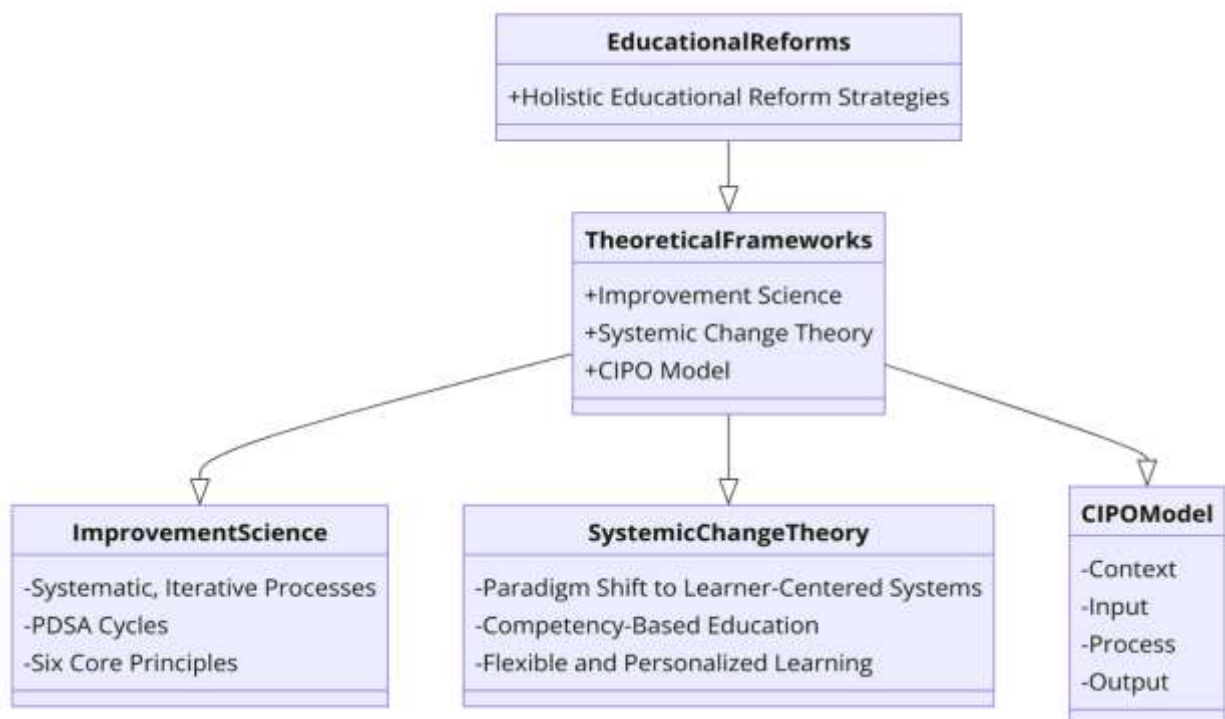


Figure 1: Framework of the study

Methodology and Procedure

This research employs a mixed-methods research design, combining quantitative and qualitative approaches to assess the effectiveness of education reforms in Punjab, Pakistan. A descriptive research design is used to examine the impact of government initiatives, teaching methods, and infrastructure on education quality. By integrating statistical data analysis and qualitative insights, the study aims to provide a comprehensive understanding of the key factors influencing educational outcomes (Creswell & Creswell, 2018; Johnson & Onwuegbuzie, 2004).

Target Population and Sampling

The study focuses on school administrators and teachers from both public and private institutions. A stratified random sampling technique ensures balanced representation from urban, semi-urban, and rural areas of Punjab. The sample includes 100 school administrators and 200 teachers, allowing for a detailed examination of administrative and instructional challenges across various school environments (Teddlie & Yu, 2007).

Data Collection Methods

Data is gathered from both primary and secondary sources:

- **Surveys and Questionnaires:** Structured surveys collect insights from teachers and administrators on curriculum effectiveness, teacher training, infrastructure availability, and challenges in the education sector.
- **Semi-Structured Interviews:** Conducted with 100 school administrators, these interviews explore issues related to school management, resource allocation, and the impact of education reforms (Merriam & Tisdell, 2015).
- **Classroom Observations:** Randomly selected schools are observed to assess teaching methods, student engagement, and the integration of technology in classrooms (Patton, 2015).
- **Secondary Data:** Government reports, international education studies, and prior research findings provide contextual support for the primary data (World Bank, 2023; UNESCO, 2022).

Data Analysis

The collected data is analyzed using both quantitative and qualitative methods:

- Descriptive statistics (mean, frequency, and standard deviation) are applied to survey responses.
- Thematic analysis is used to identify recurring patterns in school administration, curriculum implementation, and teacher development from interviews and classroom observations (Braun & Clarke, 2006).

Ethical Considerations

Strict ethical guidelines are followed throughout the study. Informed consent is obtained from all participants, and confidentiality is ensured to protect personal information. The study adopts a neutral and objective approach to maintain data reliability and validity (Silverman, 2020).

Limitations of the Study

While the study provides valuable insights, it has some limitations:

- The focus on Punjab alone prevents a comparative analysis with other provinces.
- Self-reported data from surveys and interviews may introduce bias.
- Time constraints limit the possibility of a long-term assessment of reform outcomes (Cohen, Manion, & Morrison, 2018).

This structured and methodical approach provides a rigorous evaluation of Punjab’s education reforms, offering valuable insights for school administrators, educators, and policymakers to improve the quality and accessibility of education in the region

Data Analysis and Interpretation

This section presents the study's findings based on an analysis of both numerical data and qualitative insights. Information was gathered from 100 school administrators and 200 teachers representing public and private schools across urban, semi-urban, and rural areas of Punjab. The results highlight key challenges in education reforms, examine the influence of teacher training on student learning outcomes, and provide observations on teaching practices.

1. Quantitative Analysis (Survey Data)

Table 1: Demographic Characteristics of Respondents

Variable	Categories	Frequency (n = 300)	Percentage (%)
Gender	Male	170	56.7%
	Female	130	43.3%
Type of Institution	Public School	180	60.0%
	Private School	120	40.0%
Teaching Experience	1 - 5 years	90	30.0%
	6 - 10 years	110	36.7%
	11 - 15 years	70	23.3%
	16+ years	30	10.0%

Interpretation:

Table 1 outlines the demographic characteristics of the respondents. The majority of participants were male (56.7%), while females accounted for 43.3%. Most respondents were from public schools (60.0%), with 40.0% representing private institutions. The largest group of teachers (36.7%) had between 6 to 10 years of experience, while only 10.0% had more than 16 years of experience. This distribution offers a broad perspective on the impact of education reforms across varying levels of experience and institutional settings, as shown in the figure below.

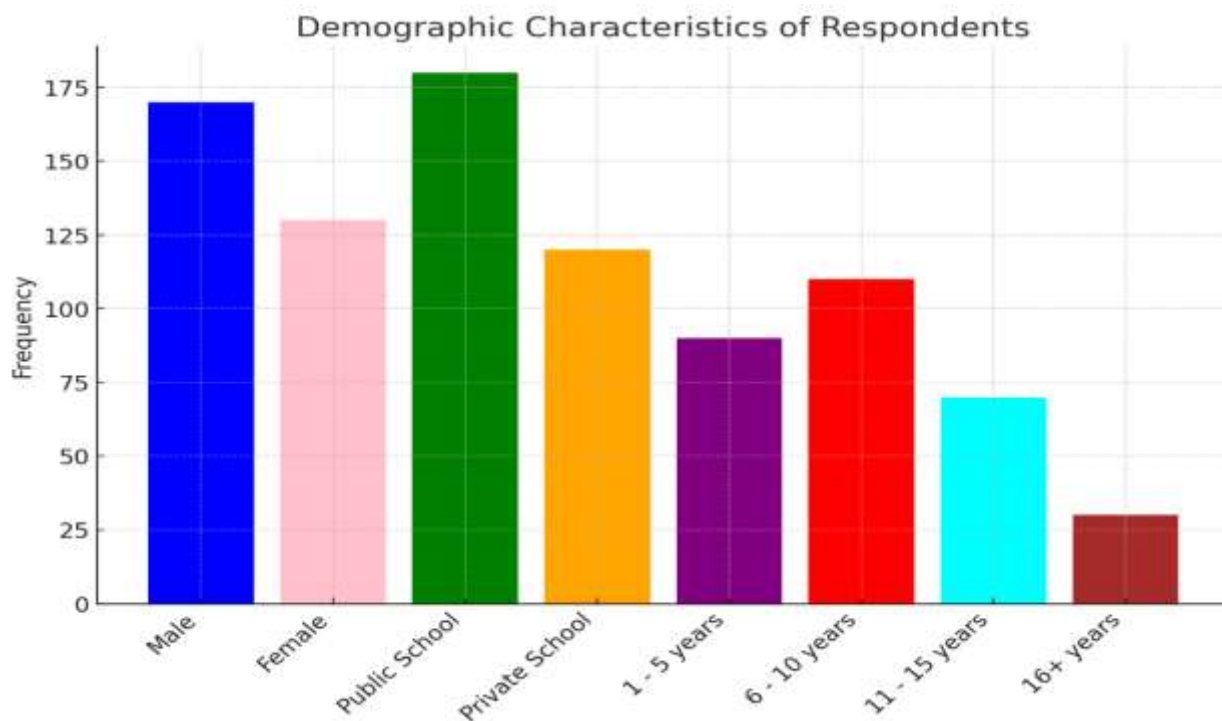


Figure 2: Demographic Characteristics of Respondents

Table 2: Key Challenges Identified in School Reforms

Challenge	Public Schools (%)	Private Schools (%)	Overall (%)
Lack of proper infrastructure	78.3%	40.2%	62.0%
Inadequate teacher training	72.5%	35.8%	55.5%
Overcrowded classrooms	81.0%	29.0%	60.0%
Insufficient learning resources	76.8%	42.3%	59.6%
Limited access to digital learning tools	68.2%	30.1%	49.2%

Interpretation:

Table 2 outlines the key challenges in Punjab’s education system. Infrastructure issues are more prevalent in public schools (78.3%) compared to private schools (40.2%). Overcrowded classrooms (81.0%) and insufficient teacher training (72.5%) are also significant concerns in public schools, while private institutions face similar but less severe challenges. These findings highlight the need for improvements in infrastructure, teacher training, and access to digital learning resources.

Table 3: Impact of Teacher Training on Learning Outcomes

Level of Teacher Training	Student Performance (Average Score %)
No formal training	48.3%
Basic training	62.7%
Advanced training	75.5%
Continuous professional development	82.9%

Interpretation:

Table 3 shows the correlation between teacher training and student performance. Students taught by teachers without formal training scored an average of 48.3%, while those whose teachers received continuous professional development (CPD) achieved an average score of 82.9%. These results highlight the significant role of teacher training programs in improving student learning outcomes.

2. Qualitative Analysis (Interview and Classroom Observation Themes)**Table 4: Thematic Analysis of Qualitative Data**

Codes	Sub-Themes	Themes
Lack of computers, outdated textbooks, limited internet access	Limited access to ICT, outdated resources	Lack of Digital Integration
Rote memorization, exam-focused learning, lack of critical thinking activities	Traditional teaching methods, lack of creativity in curriculum	Curriculum Rigidity
Paperwork overload, long administrative meetings, insufficient teaching time	High administrative burden on teachers, limited classroom engagement	Teacher Workload
Male-dominated staff in rural schools, lack of female leadership opportunities	Low female teacher retention, gender imbalance in school leadership	Gender Disparities
PTA involvement, parental awareness programs, school-community collaboration	Community support for education, improved student attendance	Community Involvement

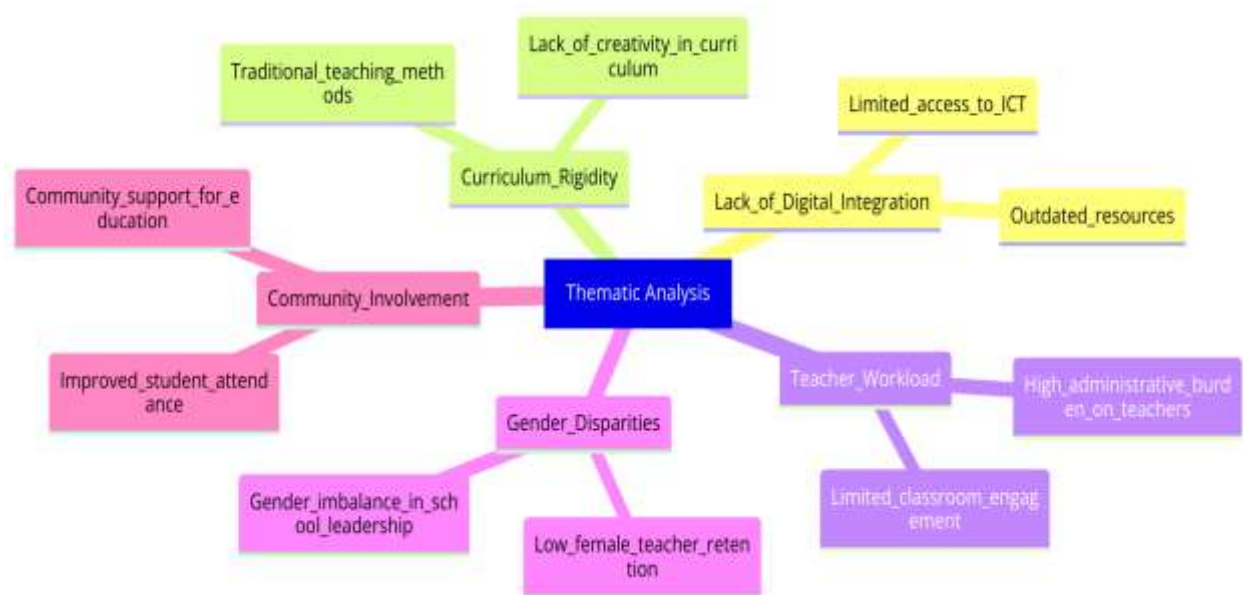


Figure 3: Thematic Analysis

Description of Thematic Analysis

1. Lack of Digital Integration

A major issue identified was the lack of digital resources and ICT infrastructure in schools. Many public schools in Punjab do not have smart classrooms, updated textbooks, or reliable internet access. Teachers reported limited access to e-learning materials, making it difficult for students to adapt to technology-based learning. In contrast, private schools have invested more in digital tools such as interactive whiteboards, online educational platforms, and digital libraries. This gap underscores the need for government initiatives to enhance digital learning in public schools.

2. Curriculum Rigidity

Interviews revealed that the current curriculum is rigid and outdated, promoting rote memorization instead of conceptual learning. Teachers and administrators noted that exams primarily test recall of textbook content rather than analytical or critical thinking skills. There is little emphasis on creativity or real-world application of knowledge, particularly in science and social studies. Findings suggest that shifting toward competency-based learning and curriculum reforms is essential to improve student engagement and understanding.

3. Teacher Workload

Teachers expressed concern over excessive workloads, which limit their ability to focus on effective teaching. Many reported being overwhelmed with paperwork, administrative meetings, and clerical tasks, leaving little time for lesson planning and student engagement. This issue is particularly severe in public schools, where teachers are frequently assigned non-teaching duties such as election work, census data collection, and government surveys. To address this challenge, teachers suggested reducing administrative responsibilities and increasing support staff, allowing them to concentrate on improving teaching methods.

4. Gender Disparities

The study identified significant gender disparities in teacher retention and leadership roles, particularly in rural areas. Many female teachers leave the profession due to security concerns, cultural restrictions, and limited career growth opportunities. Leadership positions, such as school

principals and district education officers, are often held by male administrators, reducing female representation in decision-making. Promoting gender inclusivity in the education workforce is essential for improving teacher retention and enhancing student outcomes.

5. Community Involvement

The study highlighted the positive impact of community involvement on student performance and school improvement. Schools that actively engaged with parents and local communities reported higher student attendance, better discipline, and improved academic performance. Parent-Teacher Associations (PTAs), school outreach programs, and awareness sessions on the importance of education played a key role in encouraging family support for children’s learning. Administrators emphasized that parental involvement in school activities helps reduce dropout rates and enhance learning outcomes.

Table 5: *Classroom Observations - Teaching Methodologies*

Teaching Strategy	Effectiveness (Scale: 1-5)	Usage in Public Schools (%)	Usage in Private Schools (%)
Lecture-based learning	2.8	82%	45%
Interactive discussions	3.9	55%	75%
Digital learning tools	4.2	40%	85%
Student-centered learning (group work)	4.1	50%	80%

Interpretation:

Table 5 outlines the teaching methodologies observed in classrooms. Lecture-based learning is the primary method in public schools (82%), while private schools incorporate interactive discussions (75%) and digital learning tools (85%) more frequently. Student-centered learning is also more prevalent in private institutions (80%) compared to public schools (50%). These findings indicate the need for public schools to adopt more interactive and technology-driven teaching strategies to enhance student engagement.

The study identifies major challenges in Punjab’s education sector, particularly in infrastructure, teacher training, and outdated teaching methods. Public schools face greater difficulties than private institutions, including overcrowded classrooms, limited learning resources, and inadequate teacher training. The findings emphasize the need for improved teacher training programs to enhance student learning, greater integration of digital learning tools in classrooms, curriculum revisions to promote interactive and student-centered learning, and infrastructure development in public schools to address overcrowding and resource shortages.

Discussion

The data collected from our study highlights major challenges within Punjab’s education system, emphasizing deficiencies in infrastructure, inadequate teacher training, rigid curricula, and gender disparities. These challenges have plagued Pakistan’s education system for years, despite government interventions aimed at improving access and learning outcomes. The study underscores the urgent need for comprehensive policy measures to address these concerns (Baloch, 2016; Hoodbhoy, 2020; UNESCO, 2022).

One of the most pressing issues identified is the lack of proper infrastructure, particularly in public schools, where a significant percentage of respondents reported inadequate facilities. Many schools struggle to provide students with essential learning resources, including classrooms, electricity, sanitation, and even basic amenities. This lack of infrastructure also affects teachers' ability to deliver effective lessons, widening the gap between public and private schools, as private institutions have better access to learning resources and technology-driven education. These findings align with Baloch (2016), who emphasized that inadequate physical resources significantly hinder both student learning and teacher effectiveness. Closing this gap requires strategic investments in school infrastructure, particularly in rural and underserved communities, to ensure equitable learning opportunities for all students.

The study further highlights deficiencies in teacher training, with 55.5% of respondents stating that teachers lack sufficient professional development opportunities. Public school teachers are particularly affected, with 72.5% reporting insufficient training in modern teaching methodologies. These findings align with Darling-Hammond et al. (2017), who argue that teacher training is one of the most critical factors influencing student learning outcomes. A strong correlation between teacher training and student performance was observed, with students taught by well-trained teachers scoring an average of 82.9%, while those taught by untrained teachers scored only 48.3%. Given these results, it is crucial for policymakers to implement structured teacher training programs that focus on innovative teaching strategies, digital learning tools, and student-centered teaching methods (Afzal, Rafaqat & Sami, 2023). Expanding professional development opportunities for teachers can significantly improve educational outcomes across the province.

Another major issue is the rigidity of the curriculum, which limits students' ability to develop critical thinking and problem-solving skills. The current system prioritizes rote memorization over conceptual understanding, making it difficult for students to apply their knowledge in real-world scenarios. Hoodbhoy (2020) also raises concerns about Pakistan's education system being more exam-oriented than skill-based. The lack of curriculum flexibility prevents teachers from incorporating interactive teaching methods and stifles students' creativity and analytical abilities. Reforming the curriculum to emphasize competency-based learning would shift the focus from memorization to practical knowledge, better preparing students for higher education and professional careers.

Gender disparities in education remain a persistent challenge, particularly in rural areas, where female teacher retention is low due to security concerns, cultural restrictions, and limited professional growth opportunities. Many rural schools struggle to retain female educators, further limiting access to quality education for girls. UNESCO (2022) highlights that gender inequality in education is a significant barrier to achieving Sustainable Development Goals (SDGs) in developing countries. Addressing this issue requires targeted policy interventions, such as incentivizing female teacher recruitment, ensuring safe working environments, and promoting leadership opportunities for women in education. Increasing female participation in education can help bridge gender gaps and create a more inclusive learning environment for all students.

Despite these challenges, the study also highlights several positive reforms and initiatives that have contributed to improvements in Punjab's education system. Programs like the Female Secondary School Stipend Program (FSSP) have led to a 9% increase in female enrollment (World Bank, Chaudhury & Parajuli, 2006). Similarly, the Education Voucher Scheme (EVS) has expanded access to private education for children from low-income families, benefiting over 500,000 students (Malik, 2010). Additionally, the establishment of 12 new universities, particularly in

underdeveloped areas, reflects the government's commitment to expanding higher education opportunities (Government of Punjab, 2022). These targeted financial interventions demonstrate the potential for well-designed policies to increase school participation rates and improve learning outcomes.

To achieve long-term improvements in Punjab's education system, a multi-faceted approach is necessary. Prioritizing infrastructure development can create safer, well-equipped schools that provide a conducive learning environment. Implementing structured teacher training programs focused on modern teaching methods and technology integration can enhance the overall quality of education. Curriculum reforms that emphasize competency-based education and problem-solving skills can better prepare students for academic and professional success. Promoting gender equity through female teacher recruitment, leadership opportunities, and workplace safety policies can help address gender disparities in education. Strengthening collaboration between the government, private sector, and local communities can further drive long-term improvements in the education system.

While education reforms in Punjab have led to some progress, further enhancements are needed to achieve meaningful and lasting impact. The study emphasizes the need for sustainable policies, continuous investment in education, and collaborative efforts among government institutions, private organizations, and communities. Future research should focus on long-term studies to evaluate the effectiveness of these reforms, ensuring that Punjab's education system aligns with international standards and meets the evolving needs of students. Longitudinal studies should assess how improvements in infrastructure, teacher training, and curriculum changes influence student outcomes over time. Additionally, comparative studies between Punjab and other provinces could provide valuable insights into regional disparities in education policies and outcomes, helping to develop more targeted and region-specific interventions.

Conclusion

The challenges, reforms, and potential solutions for Punjab's education system were studied in this research, focusing on the distinctive issues such as poor infrastructure, insufficient teacher training, rigid curricula, and gender disparities. Some reforms in this direction have successfully increased access and enrollment, but all is not well: there are still large gaps in the quality, equity, and governance of education. Multiplying these challenges is the need for policy reform, investment, curriculum- as well as school infrastructure improvements, and teacher training programs.

Another significant issue found is Poor Infrastructure, especially in Public Schools—Overcrowded classrooms, limited access to digital learning tools, and insufficient fundamental facilities affect teaching and learning heavily. In fact, there is a very strong correlation between teacher training and student learning outcomes, and the issue worsens with a lack of professional development opportunities for the teachers. Without ongoing training, educators may find it intimidating to update their teaching methods, leading to sub-optimal learning experiences. The transparent curriculum is another hurdle to overcome, as it focuses on rote memorization instead of critical thinking and solving, which are the main goals of these TPS-based new methods. This restricts the teachers in utilizing interactive methods of teaching and students from using their knowledge as active in-field participants.

There are gender gaps as well, especially in rural areas, where cultural norms and security issues hinder female teacher retention and student attendance. This situation is compounded by a scarcity of female educators within these regions, which limits educational opportunities for girls, thus

amplifying the gender gap in access to learning. Despite these obstacles, some initiatives have yielded positive results. Increased School Participation: Programs like the Female Secondary School Stipend Program and the Education Voucher Scheme have led to increases in school participation rates. The growth of digital learning programs and the new universities also indicate efforts to augment access to higher education. Yet these programs demand sustained policy support, proper execution, and regular evaluation to deliver their long-term benefits.

A multi-pronged reform for the key vertical of Punjab's education system is needed to make it strong. Education is the bedrock of any nation, and therefore prioritizing investment in schools, introducing a more flexible and skills-focused curriculum, and creating structured teacher training programs are among the solutions to improve education. Additionally, promoting the recruitment and retention of female teachers has the potential to narrow gender gaps in access to education. Finally, public and private institutions can work together to bridge the gap by encouraging community involvement in schools and using technology as an extended factor as well.

Implications of Research

Education is the key to human development and innovation in societies globally. The areas that require urgent attention, according to the study, range from infrastructure shortfalls, lack of teacher training, the anti-inclusivity of curricula, and gender disparity. Their resolution may necessitate sound and informed policymaking, school governance, and educational reform processes.

The paper argues for increased investment in educational infrastructure, especially in public schools that lack basic facilities, including classrooms, electricity, and access to digital learning. The evidence suggests that the physical learning environment at schools in both rural and low-income areas significantly contributes to minimizing the public-private gap. Finally, the close relationship between teacher training and student learning outcomes illustrates the importance of professional development programs that help teachers develop innovative and modern teaching methods, digital skills, and competency-based instructional methods. Recurrent training should be available to all teachers, particularly those from rural and disadvantaged communities.

The report also emphasizes the need for curriculum reform. However, Punjab's education system still relies heavily on rote learning, which hinders the development of critical thinking and problem-solving skills among students. A focus on competencies that include real-world applications, interactive learning, and analytical reasoning would better equip students for university and the job marketplace. Wider classroom use of technology would also help students develop the digital skills they need for success in their future courses and jobs.

However, gender differences in education remain a huge area of concern, especially in rural areas. Retention rates for female teachers are abysmally low owing to cultural and security challenges, undermining the quality of education for young girls. Pakistan must establish policies that promote the hiring of female teachers, provide safe working environments, and create leadership opportunities for women in the education sector to tackle this hurdle. Schools, communities, and other stakeholders must also collaborate to enhance female student enrollment and retention, ensuring that cultural barriers do not prevent girls from attending school.

The study also serves as a reminder for school administrators and educators that they need to work hand in hand with local communities and parents to enhance student involvement and decrease dropout rates. Schools that engage parents in the decision-making process, conduct awareness programs, and actively involve the local community tend to have higher student attendance and academic performance. In fact, if one key goal exists for creating a more effective and supportive

school environment, it is strengthening relationships between students, their families, and their communities.

This study highlights the need for further research, particularly in developing regions, to track the long-term impact of education reforms in the Punjab. Future studies should adopt a longitudinal approach, assessing how changes in infrastructure, teacher training, and curriculum influence student outcomes over time. Comparative studies between Punjab and other provinces could also provide valuable insights, helping to develop more targeted, region-specific interventions.

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