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Cluster School System: Understanding Barriers and Uptake of Effective Education in Rural Areas of Pakistan

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Abstract

This study examines the barriers and uptake of the cluster school system in remote areas of Taluka Kingri, District Khairpur Mir, Sindh, Pakistan. The cluster-based schooling, which groups geographically nearby schools to foster collaboration, shared resources, and decentralised decision-making, is a feasible system to uplift educational outcomes in resource-constrained settings. Using a qualitative case study method, data were collected through semi-structured interviews with eight participants from the Ahmedpur cluster hub school. Using Thematic Analysis, key areas were found, including rural educators' professional development, collaboration, resource availability, stakeholders' engagement, and educational needs of the 21st century. While respondents highlighted many barriers such as limited infrastructure, lack of resources, poor policy implementation, gender inequalities, travel difficulties, especially for female educators in remote areas and local political interferences. The respondents recommended that this system align with 21st-century educational goals. The Sindh government needs to implement a Clear policy and provide proper resources.

Keywords

Cluster school system
Policy implementation
Professional development
Resource constraints
Rural education

INTRODUCTION

The Mission of providing Effective education remains a global and local need, specifically in geographically remote areas. Unique barriers such as resource constraints and professional isolation hinder the quality of education in rural settings. In Various developing countries like Pakistan, Zimbabwe and Namibia, the Cluster School System (CSS) groups geographically close schools into a network to promote collaboration, resource-sharing, and professional development, especially among rural educators (Mphahlele, 2012; Ali & Ansari, 2023). By fostering collaboration among rural educators, the CSS aims to improve the instructional practices of rural educators and student outcomes in remote areas (Harmon et al., 2007). According to Talpur et al. (2025), the reason behind adopting the cluster approach is grounded in the recognition that individual schools often face various barriers such as professional isolation, limited access to pedagogical support, and inadequate teaching materials. The CSS provides opportunities for collaborative learning and sharing expertise among the educators of isolated schools (Mphahlele & Rampa, 2014).

The CSS also provides a platform for continuous professional development, enabling teachers to adopt innovative teaching strategies and receive training aligned with their professional needs. The implementation of the CSS has various barriers like inconsistent policy frameworks, lack of funding, logistical hindrances linked to rural geography, especially for female educators and stakeholder engagement, that continue to constrain its potential (Shikalepo, 2018; Talpur et al., 2025). These barriers undermine the sustainability of professional growth initiatives within the CSS. In Pakistan, where educational inequalities between urban and rural settings remain pronounced, it's necessary to understand these barriers for strengthening the uptake and effectiveness of cluster-based education. This research identifies workable strategies for improving the impact of the CSS in remote areas. This study especially aims to explore how improved governance and professional development frameworks can maximise the advantages of the CSS, ultimately contributing to quality education for students of remote areas.

Problem Statement

Providing quality education in remote areas of Pakistan remains one of the biggest challenges, where socio-economic, infrastructural constraints and geographical limitations limit access to effective learning opportunities. In Pakistan, particularly Sindh's rural districts, like Khairpur Mir, Schools often function in isolation, with limited opportunities for teacher collaboration, a lack of professional development programs, and insufficient resources to meet the needs of 21st century modern education. This model

(CSS), which groups defined geographically close schools under a central hub school for non-centralised management, shared resources and professional development of rural educators, has been adopted as a reform strategy to address these disparities (Mphahlele, 2012).

According to Nakambonde-Daniel, (2018) and Shikalepo (2018), the CSS offers documented advantages, including enhanced educators' collaboration, shared instructional resources, and continuous professional development (CPD). Its execution in Sindh has been hindered by various barriers. These barriers include unclear policy frameworks, lack of funding, poor infrastructure, gender inequalities, local political interference and inadequate stakeholder engagement (Chikoko, 2006; Talpur et al., 2025) in rural schools specifically in Taluka Kingri, District Khairpur Mir face such challenges such as lack of basic facilities, limited ICT tools and logistical constraints for attending Cluster meetings and training sessions particularly for female teachers. Though this model aligns with 21st-century educational goals, the CSS in Taluka Kingri, District Khairpur Mir struggles to achieve its set targets due to fragmented policy implementation, resource constraints and lack of dedication from government and non-governmental stakeholders. Without a proper strategy from stakeholders that addresses these barriers, the actual potential of the CSS to improve rural education remains underutilised. In this regard, a deeper investigation into the challenges to execution and the uptake of effective educational practices within the CSS framework is necessary for formulating a target policy that can enhance the quality of rural education in Sindh, Pakistan.

Objectives of the Study

- To identify the barriers of the Cluster-Based Schooling system in District Khairpur Mir, Sindh, Pakistan.
- To explore collaboration among rural educators to improve the uptake of effective education in rural schools of the District Khairpur Mir, Sindh, Pakistan.

Research Questions

- What are the barriers of the Cluster-Based Schooling system in District Khairpur Mir, Sindh, Pakistan?
- How does collaboration among rural educators affect the uptake of effective education in rural schools of the district Khairpur Mir, Sindh, Pakistan?

LITERATURE REVIEW

The idea of the CSS focused on educational reform strategies and the importance of quality education, especially in a limited resources environment (IIEP & Giordano, 2008; Mphahlele, 2012). According to Talpur et al. (2025), the cluster approach is based on the idea that by grouping schools within a defined geographical area, they can collectively utilise resources, expertise and professional development opportunities that might otherwise be unreachable to individual schools.

Benefits of the Cluster-Based Schooling System

The CSS helps to develop Collaboration and Combined resource utilization among teachers and Schools. This collaborative approach of the Cluster-Based Schooling System allows for sharing teaching plans, experiences and resources, which specifically benefits in remote areas where schools may be isolated (Delpport & Makaye, 2009; Talpur et al., 2025). The Combining of nine resources including libraries, science laboratories, and sports equipment, can improve the learning environment for all students in the CSS. Cluster-Based Schooling System Provides opportunities for professional development of rural educators including workshops, peer observations and training sessions which are necessary for instructional practices and ensuring that teachers working in isolated schools furnished with modern pedagogical skills (Delpport & Makaye, 2009). According to Delpport & Makaye (2009), transfer of ideas and mutual support among rural educators within a CSS can boost professional development and improve teaching effectiveness.

Cluster-Based Schooling System provides a platform for a learning environment for rural educators reducing the workload and difficulty associated with implementing new curricula and resolving complicated educational challenges (Jita & Mokhele, 2014). Talpur et al. (2025) highlighted that collaborative problem solving offers continuous professional development within the teaching brotherhood. According to Dittmar et al. (2002), CSS promotes decentralized decision-making allowing for more confined and responsive management of educational affairs. This model increased efficiency in resource allocation, finer alignment with locally determined goals and enhanced financial management.

Barriers to Result-Oriented Implementation

Although recognised benefits, the effective implementation of CSS is often hindered by various significant barriers. The main barrier to the effectiveness of CSS is the lack of a clear and legally binding framework (Nakambonde-Daniel, 2018; Shikalepo, 2018). Without specific guidelines and mandates, execution can be irregular, leading to an absence of accountability and minimal support for educators and cluster activities (Talpur et al., 2025). Resource limitation, including deficient funding, insufficient access to educational materials, and absence of necessary infrastructure (e.g., ICT Tools, electricity, place for meetings), significantly impede the ability of CSS to function efficiently (Şahin et al., 2024; Shikalepo, 2018; Talpur et al., 2025). The lack of dedicated funds for modal activities often means that operations are dependent on the constrained budgets of individual schools, leading to low motivation among participants who are expected to perform extra work without adequate support (Shikalepo, 2018).

According to Dittmar et al. (2002) and Talpur et al. (2025), while the CSS aims to group geographically close schools, travel difficulties, specifically in remote rural areas, it can still pose a significant barrier for educators attending CSS meetings and training sessions. This can hinder participation and weaken the collaborative morale of the system. The absence of a deep understanding of the CSS and its operations among many stakeholders, including beginner educators and parents (Shikalepo, 2018). This can lead to poor engagement and a lessened sense of ownership, further impeding the system's effectiveness. Improper school clustering can create inequalities, which makes it more difficult for schools to share resources (Shikalepo, 2018). It may affect the school's operation in isolation rather than as a unified unit. Head of institutions and educators often face increased workloads due to CSS activities. Inadequate human resources or improper time allocation can lead to overwork and neglect of cluster responsibilities (Shikalepo, 2018). Outer factors, such as union opposition to unpaid extra work or political interferences in the hiring and termination of staff, can weaken the autonomy and effectiveness of CSS (Chikoko, 2006; Shikalepo, 2018).

The preferences for re-centralization of authority by superior officials, often citing worries about corruption at the local level, also offer a significant threat to decentralized school governance (Chikoko, 2006). According to Talpur et al. (2025), global educational reform frameworks emphasize skills such as digital literacy, collaboration and adaptability among rural educators. Moreover, the CSS is theoretically relevant to these needs; its practical implementation in rural Sindh remains limited due to limited infrastructure, unclear policy execution and weak implementation strategies. Understanding these various barriers is critical for developing effective plans to improve the uptake and sustainability of the CSS, finally leading to enhanced educational outcomes in rural schools.

Theoretical Framework

This research is based on Social Constructivist Theory and Educational Change Theory. Both philosophies provide conceptual ground for understanding the dynamics of the CSS in a rural context.

Social Constructivist Theory

Presenting the Social Constructivist Theory (SCT), Vygotsky (1978) emphasized that learning is a socially mediated process where interaction, collaboration, and dialogue among peers and mentors are central to knowledge construction. The Model of CSS applies these principles by facilitating educator peer observation, collaboration and a shared professional learning environment within geographically close

schools. By exchanging pedagogical strategies, combined resource utilization and joint problem-solving within clusters reflect Vygotsky's concept that cognitive growth is improved through social interaction in a zone of Proximal Development (ZPD).

Educational Change Theory

Sustainable educational reform requires coherent policy direction, adequate resources, stakeholder engagement and strong leadership indicated by Fullan (2007), presenting the Educational Change Theory (ECT). In the Sindh CSS, execution can be analyzed through this lens, where its success depends upon the model's design and on the systemic capacity to support, resource and adapt the reforms to the local needs of the Institution. Challenges like inadequate infrastructure, unclear policy frameworks and local political involvement reflect gaps in Fullan's identified change drivers- vision clarity, continuous capacity building and collaborative culture.

Integration of SCT and ECT in the Present Study

The theoretical framework positions the CSS by combining both theories (SCT and ECT) as both a collaborative learning environment for teachers and a systematic reform initiative requiring Support. The CSS's collaborative design aims to strengthen educator professional growth through peer engagement (Vygotsky), though its policy and execution barriers can be evaluated using Fullan's change dimensions. This perspective enables analysis of both pedagogical advantage and systemic limits, informing recommendations for policy framework and practice.

METHODOLOGY

This case study aimed to investigate barriers and uptake of effective education in rural schools of the taluka Kingri in the district Khairpur Mir, Sindh, Pakistan. A case study is viewed as a deep study of a specific case that can generate elucidating insights (Babbie, 2020). According to Leedey and Ormond (2005), a result obtained from the case study are bound within a particular time and setting, and thus not generalizable. We trust that they are indeed transferable, as they give recommendation for the intelligent interpretation of other similar cases.

Research Design

The research design helps the researcher to gain a deep understanding of respondents' opinions on the execution process of the CSS, potential solutions for the model and operational challenges of the CSS. This research study was conducted in Taluka Kingri, District Khairpur Mir, Sindh. Khairpur Mir is a geographically dispersed district, with a lack of proper infrastructure and socio-economic barriers, making this district representative for understanding the complications of implementing a CSS model in rural Pakistan.

Participants and Sampling Technique

The target population is based on teachers and administrative staff involved in the CSS. A Total of eight participants were recruited, including the focal person, guide teachers, subject coordinators and mentee teachers through purposive Sampling to ensure that participants have relevant experience and knowledge with the system. The criteria for selecting participants were based on:

- Participants are directly involved in the CSS Model
- Participants who have one year of working experience within the CSS
- Participants are willing to participate and share their perspectives based on their experiences

Data Collection and Analysis

In this case study, data were collected through semi-structured interviews that contained open-ended questions, which helped to collect the responses of participants' perceptions of the effectiveness of CSS

implementation. The set interview guide based on open-ended questions addressing:

- Understanding the Institutional Structure of the model and purpose of the CSS
- Identified advantages and professional growth opportunities for rural educators particularly in remote areas
- Sufficient resources and their availability in under resourced Institutions
- Identify the barriers to effective execution of the model
- Recommendations and possible solutions for the main Stakeholders

The reliability of evidence was ensured by comparing the responses from the various participants, focal person, Guide teachers, subject coordinators and mentee teachers to achieve the set Objectives.

Ethical Considerations

Approval was obtained from the Department of Teacher Education, Faculty of Education at Shah Abdul Latif University, Khairpur Mir. Before recording audios, all participants were informed about the study's purpose and procedures. All participants were ensured that their identity would not be public.

Limitations of the Research Methodology

The qualitative case study provides a small and specific sample, which limits the generalizability of results. The study's focus on one pilot hub school and its Cell hub and feeder schools, findings should be interpreted as contextually rich but not overall representative. Future studies could employ a mixed-method approach to integrate qualitative depth with quantitative breadth.

RESULTS & FINDINGS

Thematic Analysis is mainly used in qualitative research for identifying and analyzing themes within data. Thematic analysis is a tool for interpreting the perceptions, challenges and opportunities regarding the execution of the CSS in the rural areas of the district of Khairpur Mir. Thematic analysis enables the classification of themes related to the barriers and factors promoting the uptake of cluster-based educational reforms. By focusing on ideas and narratives from semi-structured interviews, the findings of this analysis will inform policy recommendations aimed at improving educational equity and institutional efficiency in under-resourced settings like Khairpur Mir.

Comprehension of the CSS

All respondents had knowledge about the cluster school system as a grouping of geographically close schools, which were designed to decentralize management and strengthen education delivery. This grouping was proposed to modernize operations and boost administrative performance. One of the respondents said,

"schools are grouped together in a radius of 3 to 5km working under a cluster hub school..."

"According to cluster school policy, geographically closed schools merged into a group or were decentralized to transfer authority or power and resources to a lower level." Respondent 3.

The same viewpoint was shared by Respondent 7,

".... a small group of geographically nearest schools to manage effective educational activities..."

Purpose of Implementation of CSS

Respondents focused on the major goal of enhancing teacher training, stimulating collaboration, inspecting teaching practices, and ultimately uplifting educational results in the rural areas of District

Khairpur Mir. As Respondent 4 mention,

“.... cluster system simplifies the education system and serves as a means for teacher to enhance their skills, ultimately improve students’ performance”

Respondent 5 shares,

“The primary purpose of implementing this system is to create a sense of ownership among stakeholders and empower teachers to impart knowledge in the classroom”.

Availability of Resources

Although there are some resources, such as laptops, manuals and training sessions, that are provided. Respondents continuously reported limitations of infrastructure (internet, electricity, multimedia tools and transportation), making it difficult to utilize these resources effectively. One of the respondents highlighted,

“.... proper infrastructure, electricity, internet facility, technology tools for teaching- learning process and laboratories. Even though there are no technological tools for teachers’ training, only hard materials are provided”.

Likewise, another respondent shares,

“Due to lack of necessary facilities, no-cost and low-cost materials are used for hands-on activities...”
Respondent 5.

Respondent 6 said,

“.... resources are not available like proper infrastructure and basic facilities for effective education”.

Teachers Professional Development and Collaboration

Continuous Monthly training sessions, classroom observation by guide teachers and subject coordinators, and peer collaboration among teachers were emphasised as valuable benefits. These activities improve confidence, experience sharing, and support in continuous professional development. As Respondent 2 mentioned,

“In CSS, teachers’ confidence is boosted through collaboration with other teachers and continuous training sessions...”

A respondent added,

“... Through this system, teachers have access to teacher training sessions for their professional development. Guide teachers and subject coordinators play a vital role in supporting and assisting teachers by discussing and resolving school-related issues” Respondent 4.

“In a CSS, monthly training sessions and observations by subject coordinators and guide teachers offer a platform to foster collaboration and share experiences among teachers...” Respondent 5.

Implementation Barriers

Barriers include insufficient training sessions, travel difficulties for female teachers, lack of teaching materials, unequal gender representation, and poor implementation of policy at the primary level. It was indicated,

“.... During selection of guide teachers and subject coordinators eighteen male and two female teachers were selected, which resulted gender inequality, policy not fully implemented, poor infrastructure and basic facilities” Respondent 1.

Another respondent said,

“shortage of teachers in schools and improper selection of subject coordinators from schools which affect teaching and learning process....”

“... In my opinion, the main challenge is the transfer of powers to the cluster head teacher” Respondent 6.

Likewise, Respondent 7 said,

“The Main challenge is financial resources and shortage of teachers, as most of the teachers perform their duties of subject coordinator and guide teacher, which makes hindrances in the teaching and learning process...”

Suggestions and Solutions

Respondents highlighted personal efforts like using low-cost/no-cost materials, adjusting schedules, fostering encouraging environments, and promoting for better implementation to navigate barriers. As Respondent 1 mentioned,

“Being a focal person, I address the challenges of female teachers’ participation in training...”

Other respondents said,

“Selection of guide teachers and subject coordinators according to their qualification and using no-cost and low-cost materials....” Respondent 5.

“... Challenges will be overcome by proper implementation and clear cluster policy” Respondent 6.

21st Century Needs

While the CSS is found as a model and is capable of meeting 21st-century educational needs (technology integration, collaboration, teachers’ professional growth), the lack of basic infrastructure limits its real-world impact. One of the respondents from the CSS mentioned,

“As a model CSS fulfils teaching and learning needs of the 21st century, but here it did not due to lack of basic facilities...” Respondent 2.

Same as Respondent 3 said,

“... I think the CSS as a model fulfils the needs of the teaching and learning process of the 21st century, but in ground realities, it is difficult where there are no basic facilities available.

“... Lack of resources makes hindrances to fulfil the needs of teaching and the process of the 21st century” Respondent 8.

Main Stakeholders

Most of the respondents found the Sindh government and other stakeholders like UNICEF, IBA and HANDS as key drivers. Regardless, the lack of ongoing governmental interest and support was continuously criticised. As Respondent 1 mentioned,

“... UNICEF aims to ensure the success of the cluster policy and has requested the Sindh government to provide the required infrastructure to achieve 100% results; the government has not shown interest”.

Respondent 2 also has the same point of view, saying that,

“... Sindh government has shown less interest in achieving complete success”.

“... Sindh government and other stakeholders like IBA, PITE and SE&LD” Respondent 7.

Discussion

The results of this research align with the available literature on the CSS revealing specific insights from rural Sindh. Respondents acknowledged that the CSS promotes educators' collaboration, collective problem-solving and shared learning reliable by (IIEP & Giordano, 2008; Delport & Makaye, 2009), The Benefits of peer observation and monthly training sessions highlighted by respondents reflect the Continuous Professional Development (CPD) advantages identified by Delport and Makaye (2009) and Jita & Mokhele (2014).

However, Challenges in the rural areas of Taluka Kingri, District Khairpur Mir, Sindh, Pakistan Resemblance the barriers documented in Zimbabwe (Chikoko, 2006) and Namibia (Shikalepo, 2018). Limited resources, especially in transport, ICT infrastructure and teaching materials, are most reported by participants, mirroring the findings of Şahin et al. (2024) about resource-dependent professional development. Simultaneously, unclear policy and poor execution at the grassroots level align with the highlighting of Nakambonde-Daniel's (2018) that unclear policy hinders CSS efficiency.

The main finding from this research is gender disparity in selecting Guide Teachers and Subject Coordinators with a low number of females. While in cluster literature, particularly in regions like Sindh, gender inclusivity is often under-discussed, this new dimension to understanding equity within decentralized education systems. However, respondents reported the 21st-century educational new while the CSS meets global education reforms, and its practical limitations limit its impact. The gap between the school cluster system's potential and its ground-level implementation highlighted what Dittmar et al. (2002) explained as an "unclear-policy implementation" in centralized education reforms.

CONCLUSION

The result of this research emphasizes that the CSS, the way it is executed in the rural Setting of District Khairpur Mir, Sindh, represents both a positive reform model and a complicated implementation challenge. The CSS model aligns with global best practices in collaborative professional growth, non-centralized management, and resource utilization. The model's framework through which geographically nearby schools can share resources, addresses educational challenges collectively and exchange pedagogical expertise. This collaborative approach is specifically critical in remote areas, where limited resources, isolation and less access to professional development training frequently maintain inequalities in quality education. Although the theoretical durability of the CSS Model is mostly acknowledged by contributors, its effective educational outcomes in Taluka Kingri, District Khairpur Mir, are compromised by infrastructural and administrative challenges. These challenges include improper infrastructure, such as the internet connectivity, absence of proper electricity, ICT tools and transportation facilities that affect female teachers' presence in training Sessions. The unclear policy framework further contributes to inconsistent execution across the clusters, resulting in diminished confidence among stakeholders.

Particularly, the CSS in Sindh is facing human resource challenges that remain critical. The lack of qualified educators, the gender disparity in selecting roles in leadership, and the selection of guide teachers and subject coordinators without merit-based criteria weaken the potential of the CSS to deliver and maintain quality improvements. However, local political involvement, less governmental dedication, and collaboration between governmental and non-governmental stakeholders hinder the systemic transformation. The findings from the responses also reveal that monthly training sessions, professional observation mechanisms and peer collaboration are valued by rural teachers; their potential is affected by a lack of logistics and finances. While low-cost and no-cost teaching strategies are not substitutes for the investment required for structure to modernise rural education in line with 21st-century teaching and learning needs. The gaps between the CSS objectives, such as collaborative, student-centered learning environment and fostering technologically enriched, but on the ground realities, urgent need for comprehensive reform in policy execution, capacity building and funding allocation.

CSS model to achieve its potential impact, various interventions are necessary. Various interventions

include establishing a legally binding and clear policy framework, equal resource distribution among all clusters, providing investment for required infrastructure, avoiding gender-disparity while selection of leadership, guiding teachers and subject coordinators and fostering continuous engagement between the government, educational institutions and other stakeholders such as UNICEF, HANDS and IBA. In addition to this, a proper mechanism for evaluation, accountability, and monitoring will be necessary for the safety of the system from administrative complacency and political interference. In conclusion, the CSS is a conceptually and theoretically relevant approach to enhancing the quality of rural education; all stakeholders need to take decisive, coordinated and durable actions for effective rural education. If the CSS is properly resourced, inclusively managed and strategically executed, it has the potential to overcome the rural-urban education gap, improve rural educator capacity, and contribute to the broader goal of high-quality education for all students regardless of their abilities and background. Without these measures, the CSS risks remaining a less utilized policy initiative, yet limited in its impact on the educational futures of rural learners.

Recommendations

The following recommendations are suggested to strengthen the execution of the CSS in rural Sindh based on the findings and comparative analysis with existing literature:

Clear Policy Frameworks

To achieve set targets for each cluster, it needs to develop clear policy, operational guidelines and be legally bound. Accountability mechanisms should be developed for cluster heads, guide teachers and subject coordinators to ensure consistency in practice.

Resource Allocation and Funding

Sufficient budget allocated for cluster activities, ensuring the provision of necessary facilities like ICT tools, teaching materials and transport allowances. Need to overcome infrastructure gaps by getting support from NGOs and international donors.

Adopt Gender Inclusivity

Ensure female educators' representation in the Cluster focal person, guide teachers and subject coordinators within the CSS. Especially in remote areas like Taluka Kingri, District Khairpur Mir provide safe transportation and flexible scheduling for female educators to encourage participation in continuous professional development (CPD) activities.

Rural Educators' Capacity Building

Increase the professional development training programs focusing on digital pedagogy, modern assessment techniques and inclusive education. Encourage a peer learning environment to sustain continuous professional development of rural educators.

Improve Engagement of Stakeholders

Awareness campaigns should be conducted to familiarize local leaders, community members and parents with the objectives and advantages of the CSS. Need to foster collaboration between the Sindh government, local education boards and NGOs like HANDS and UNICEF.

Resolve Geographical Barriers

Travel allowance needs to be provided for teachers attending monthly training sessions and cluster meetings. To reduce travel dependency, use mobile Continuous Professional Development (CPD) units.

Evaluate Execution and Proper Monitoring

Develop a proper monitoring system to assess the performance of clusters and use evaluation data to

inform adaptive policy reforms.

Competing Interest

The authors declare no conflict of interest.

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