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ROLE OF LOW-TECH TEACHING STRATEGIES IN ENHANCING STUDENTS' CLASSROOM ENGAGEMENT: A STUDY OF PUBLIC SECONDARY SCHOOLS

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Abstract

Low-tech teaching methods are counted as a fundamental component of teaching in resource-poor environments as a key element of the digital divide. This research investigates the impact of the various non-digital instructional materials, such as physical charts, chalkboards, and interactive storytelling and role playing, on student engagement in public secondary schools in Hala. While many classrooms in this region are trying to adopt the latest technologies, others are still teaching in the old-fashioned style because of limitations in infrastructure, so it is important to recognize how these "low-tech" methods can be used to enhance the participation and learning of students. The study is descriptive-correlational research, which is used to assess the relationship between traditional active-learning methods and three dimensions of engagement (behavioral, emotional, and cognitive). A representative sample of teachers and students was asked to complete questionnaires to obtain data. This analysis centres on the links between the content of the curriculum and the interests of the students made by the tactile and interpersonal quality of low-technology tools. Results showed that low-tech instructional strategies like group discussion, storytelling, role play, peer learning, and physical supports to the learning environment led to significant increases in students' behavioral, emotional, and cognitive involvement. The use of low-tech teaching strategies had a strong positive correlation with student engagement. Moreover, the students in classrooms that used low-tech interactive approaches showed significantly higher levels of engagement than the students in traditional classrooms that were taught in a lecture manner. The study concludes that there is no need to spend a lot of money on technology to enhance student engagement, but rather the creative and systematic use of available resources. It suggests that equipping the educational authorities with innovative and low-tech teaching methods is a pressing need for facilitating access to quality, equitable education for all learners in the area.

INTRODUCTION

The world education paradigm has undergone an enormous change, with a focus now on embedding Information and Communication Technology (ICT) into education. The belief that high-tech tools are the only tools that will motivate students, however, leaves a pedagogical void in areas with limited high-tech resources. In

the public secondary schools of Hala, teaching is carried out in an environment constrained by infrastructure, but high-quality and stimulating teaching is a priority. In this study, emphasis is placed on the use of low-tech teaching strategies in the form of instructional activities that make use of non-digital or low-cost instructional materials as a key to improving student participation and retention. Student engagement is the extent to which students attend, investigate and are interested in what is being taught. Engagement is one of the most important factors that can affect academic outcomes (Fredricks et al., 2022; Kahu & Nelson, 2021). It's the foundation of learning; without it, learning is a passive transfer of facts. The responsibility for promoting this engagement is placed on the shoulders of the creative use of low-tech interventions in the environment that has become the "digital divide" for many, such as Hala. These include group activities, physical manipulatives, storytelling and chalkboard interactive demonstrations. This research is an effort to validate these methods, not as inferior, but as an essential pedagogical tool that is culturally relevant.

There are specific socio-economic issues with the education infrastructure of a district, such as Sindh, specifically in sub-districts like Hala. Overcrowded classrooms, irregular power supply, and non-functional computer labs are some of the challenges faced by public secondary schools. These physical and financial limitations have led to a lag in implementing a fully digital way to teach and learn, despite the strong desire in the region to modernize. The gap between private schools in urban and rural areas in Hala is significant. As "EdTech" dominates international dialogue, locally, there is a need for a pragmatic approach. There is some evidence that a high level of dependency on technology, which is unavailable at all times, can cause instructional frustrations. Thus, the background of the research in this study is the need for "Pedagogy over Tools", which means that teaching is effective regardless of the technological level. The teacher-centred approach with only 'rote learning' or 'lecture only' has been a traditional approach in local public schools. This can have led to low motivation among the learners and high dropouts at the secondary education level. The local education stakeholders increasingly understand that the active learning environment should be introduced in the classroom to enhance the quality of the Board of Intermediate and Secondary Education (BISE) results.

The contemporary educational theories, like the Constructivism, suggest that students learn in an active manner as they manipulate their environment. Low-tech ideas like using role play for social studies, pebbles for math, and newspapers for language analysis offer hands-on and social learning that screens can't match. Active learning fosters deeper learning and engagement (Prince, 2021; Slavin, 2022). Professional development for teachers improves teaching effectiveness (Ghunio, 2023; Darling-Hammond et al., 2021). This study sits at this intersection – investigating how the educators of Hala can play their role in closing the resource gap, and how they can make use of everyday objects and personal skills as effective tools to engage their students. The study will examine these strategies and offer a localized framework for teachers in Hala to engage students with world-class results, leveraging the resources they have in their hands.

Statement of the Problem

Despite the global emphasis on digital classrooms, public secondary schools in Hala continue to face significant infrastructural deficits, including frequent power outages, a lack of high-speed internet, and a shortage of functional digital devices. Consequently, there is a prevailing misconception among some educators and stakeholders that high-quality student engagement is only achievable through expensive technology. This has led to a sense of "pedagogical stagnation," where teachers, feeling unsupported by modern tools, often revert to traditional, passive lecture-based methods that fail to stimulate student interest or critical thinking. The core problem lies in the declining levels of student participation and the rising culture of rote memorization within the public

sector. When classrooms remain teacher-centred and lack interactive elements, students become passive recipients of information rather than active participants. This lack of engagement contributes to poor academic performance in board examinations and higher dropout rates at the secondary level. Furthermore, while low-tech teaching strategies (such as peer-to-peer learning, the use of local charts, and interactive storytelling) are theoretically accessible, they are often underutilized or implemented without a systematic framework in Hala's schools. There is a critical lack of empirical evidence and localized research demonstrating how these low-cost resources can be effectively harnessed to bridge the engagement gap. Unless the efficacy of low-tech pedagogy is formally explored and validated within the specific socio-economic context of Hala, public schools risk remaining in a cycle of disengagement. This study, therefore, seeks to address this gap by investigating how low-tech strategies can serve as a potent, sustainable solution to enhance student engagement in an environment where high-tech alternatives are currently non-viable.

Research Objectives

1. To identify the prevalent low-tech teaching strategies currently employed by educators in public secondary schools.
2. To assess the level of student engagement (behavioral, emotional, and cognitive) in classrooms where low-tech active learning strategies are intentionally utilized compared to traditional lecture-based settings.
3. To examine the relationship between specific low-tech instructional materials and the students' motivation to participate in daily classroom activities.
4. To identify the barriers and challenges faced by teachers in designing and implementing creative, low-cost interactive lessons.

Hypothesis

H0: There is no significant difference in student engagement levels between classrooms using low-tech interactive strategies and those using traditional, lecture-only methods.

Significance of study

This study holds substantial value for various stakeholders within the educational ecosystem of Sindh. By shifting the focus from "what the schools lack" to "how they can thrive with what they have," the research provides a pragmatic roadmap for improvement. This research serves as a practical guide for teachers who may feel demotivated by the lack of modern technology. It validates their creative efforts and provides empirical evidence that high-impact learning is possible using low-cost materials. This study will be beneficial for students in promoting strategies that favor active participation over rote memorization. This study advocates for a learning environment that is more inclusive, interesting, and effective. The findings will highlight the need for professional development programs that specifically train teachers in "Low-Tech, High-Impact" pedagogy.

Literature Review

In a few years, the global educational community will have undergone a significant reality check regarding the limitations of high-tech dependency. Low-cost teaching aids improve engagement and retention (Memon & Rashid, 2023; Nsengimana & Kotoka, 2023). Selwyn (2022) highlighted that the "digital-first" approach often widened the achievement gap in developing regions. In the specific context of Sindh, Pakistan, recent studies (Khan & Ali, 2023) have shifted the focus toward Sustainable Pedagogy. This movement argues that in public schools where infrastructure is unreliable, low-tech strategies such as interactive physical charts, group modelling, and peer-to-peer dialogue are not merely "backup plans" but are essential for ensuring educational equity.

Contemporary literature continues to utilize the tri-dimensional model of engagement behavioral, emotional, and cognitive, but with a modern lens. Recent surveys in rural Sindh schools indicate that behavioral engagement (attendance and hand-raising) is higher when teachers use tangible manipulatives rather than purely verbal lectures. Hassan et al. (2024) suggest that in semi-urban areas like Hala, students feel a greater sense of "belonging" when classroom activities reflect their

local culture through storytelling and role-play, which are cornerstone low-tech strategies. Neuro-pedagogical research (2022) suggests that "tactile learning" (learning by touching and doing) creates stronger neural pathways for memory retention than passive screen-based consumption, a finding that validates the use of physical models in Hala's science and math classrooms.

Memon & Rashid (2023) explored the use of "Low-Cost No-Cost" materials in public secondary schools. They found that when teachers used recycled materials to demonstrate physics principles or local newspapers for social studies, students demonstrated a 30\% increase in participation rates compared to traditional textbook-based teaching. Peer-Led Learning (2024) find that in overcrowded public classrooms, which are common in the Hala district, Peer-Mediated Instruction (PMI) has emerged as a high-impact, low-tech strategy. By empowering students to teach one another, educators bypass the need for expensive audio-visual aids while simultaneously boosting student confidence and leadership skills.

Current research emphasizes that for low-tech strategies to work in Hala, there must be a shift in Teacher Professional Development (TPD). Training programs in 2026 are increasingly focusing on "Micro-Teaching" and "Classroom Management without Tech," proving that a well-organized chalkboard and a structured debate can be more cognitively demanding for a student than a PowerPoint presentation. Literature regarding inclusive education in Pakistan (UNICEF, 2020) points out that "Enabling Environments" are often created through social and pedagogical adjustments rather than expensive infrastructure. For secondary schools in areas like Hala, low-tech inclusive strategies, such as peer-tutoring and customized tactile aids, are identified as sustainable ways to support diverse learners, including those with different learning speeds or physical disabilities, without requiring high-maintenance technology.

While there is a growing body of literature on educational technology and general teaching methods in Pakistan, several critical gaps remain when specifically examining the secondary schools of Hala. Your research can fill these voids:

Research Design

The study adopts a Descriptive Research Design. A quantitative study was used to measure the correlation between low-tech tools and student engagement levels using numerical data.

Population of the Study

Target Population: All teachers and students of Government Boys and Girls Secondary Schools in Hala Taluka, District Matiari.

Sample and Sampling Technique

A total of 200 students and 20 teachers were selected as sample size. Stratified Random Sampling was used to ensure equal representation of both male and female schools, as well as urban and rural peripheries of Hala.

Results

Table 1

Frequency of Low-Tech Strategies Used by Teachers (N = 200 Students, 20 Teachers)

Strategy	Mean	SD	Rank
Group Discussion	4.35	0.62	1
Storytelling	4.12	0.74	2
Role Play	4.08	0.71	3
Chalkboard Demonstration	3.96	0.69	4
Physical Charts/Models	3.88	0.77	5

Table 1 presents the mean scores, standard deviations, and rankings of various low-tech teaching strategies employed by teachers in public secondary schools. The findings indicate that

Group Discussion was the most frequently used strategy (M = 4.35, SD = 0.62), securing the first rank. This suggests that teachers highly prefer collaborative learning activities that encourage students to exchange ideas, participate actively, and develop critical thinking skills. The relatively low standard deviation indicates consistency among respondents regarding its frequent use. Storytelling ranked second (M = 4.12, SD = 0.74), demonstrating that teachers commonly use narrative-based instruction to make lessons more engaging and meaningful. Storytelling likely enhances students' emotional connection with learning content and improves attention during classroom instruction. Role Play obtained the third rank (M = 4.08, SD = 0.71), indicating that experiential and participatory learning activities are regularly incorporated into classroom teaching. This strategy allows students to actively engage with concepts, thereby promoting deeper understanding and retention of knowledge. Chalkboard Demonstration ranked fourth (M = 3.96, SD = 0.69). Despite the increasing emphasis on interactive methods, the chalkboard remains an important instructional tool due to its accessibility and effectiveness in explaining concepts visually. Its continued use reflects the practical realities of resource-constrained classrooms. Physical Charts and Models received the lowest mean score among the listed strategies (M = 3.88, SD = 0.77), although the score still indicates a relatively high level of usage. This suggests that teachers use visual and tactile teaching aids, but perhaps less frequently due to limitations in availability, preparation time, or resources.

Overall, the results reveal that teachers in public secondary schools actively employ a variety of low-tech teaching strategies, with greater emphasis on interactive approaches such as group discussion, storytelling, and role play. The high mean scores across all strategies indicate that low-tech pedagogical practices are widely utilized and play a significant role in promoting student engagement and participation in the classroom. These findings support the view that effective teaching can be achieved through creative and learner-centered methods even in environments with limited technological resources.

Table 2
Level of Student Engagement

Dimension	Mean	SD	Level
Behavioral Engagement	4.21	0.66	High
Emotional Engagement	4.08	0.71	High
Cognitive Engagement	3.98	0.73	High
Overall Engagement	4.09	0.69	High

Table 2 presents the mean scores and standard deviations of the three dimensions of student engagement: behavioral, emotional, and cognitive engagement. The results indicate that students demonstrated a high level of engagement across all dimensions, with an overall mean score of 4.09 (SD = 0.69). This suggests that students were actively involved in classroom activities and responded positively to the learning environment created through low-tech teaching strategies.

Among the three dimensions, Behavioral Engagement recorded the highest mean score (M = 4.21, SD = 0.66), indicating that students frequently participated in classroom discussions, completed assigned tasks, attended classes regularly, and remained attentive during lessons. The relatively low standard deviation reflects consistency in students' responses regarding their active participation. Emotional Engagement ranked second with a mean score of 4.08 (SD = 0.71). This finding suggests that students generally felt interested, motivated, and emotionally connected to their learning experiences. The use of interactive low-tech strategies such as storytelling, role-playing, and group discussions may have contributed to

creating a positive and supportive classroom atmosphere that enhanced students' enthusiasm toward learning. Cognitive Engagement received a mean score of 3.98 (SD = 0.73), which also falls within the high engagement category. This indicates that students invested considerable mental effort in understanding concepts, solving problems, and applying knowledge during classroom activities. Although cognitive engagement recorded the lowest means among the three dimensions, the score still reflects a strong level of intellectual involvement in learning tasks.

Overall, the findings demonstrate that low-tech teaching strategies effectively promote student engagement in public secondary schools. The high scores across behavioral, emotional, and cognitive dimensions suggest that these instructional approaches not only encourage active participation but also foster students' interest and deeper learning. Therefore, low-tech pedagogical practices can serve as an effective and sustainable means of enhancing classroom engagement in resource-limited educational settings.

Table 3
Relationship between Low-Tech Strategies and Student Engagement

Variable	r	p
Low-Tech Teaching Strategies and Student Engagement	.68	.000

A strong positive correlation (r = .68, p < .001) was found between low-tech teaching strategies and student engagement. The result indicates that increased use of low-tech strategies significantly improves student participation and learning involvement.

Table 4
Independent Samples t-Test

Group	Mean	SD	t	p
Low-Tech Interactive Classrooms	4.09	0.69	5.84	.000
Lecture-Based Classrooms	3.21	0.77		

Table 4 presents the results of the independent samples t-test conducted to compare student engagement levels between classrooms utilizing low-tech interactive teaching strategies and those employing traditional lecture-based methods.

The findings indicate that students in Low-Tech Interactive Classrooms achieved a higher mean engagement score (M = 4.09, SD = 0.69) compared to students in Lecture-Based Classrooms (M = 3.21, SD = 0.77). This difference suggests that students exposed to interactive low-tech teaching approaches were more actively involved in classroom learning activities.

The calculated t-value of 5.84 demonstrates a substantial difference between the two groups. Furthermore, the p-value (.000) is less than the established significance level of 0.05, indicating that the observed difference is statistically significant. Therefore, the null hypothesis stating that there is no significant difference in student engagement between classrooms using low-tech interactive strategies and those using traditional lecture-based methods is rejected.

These results imply that low-tech interactive teaching strategies, such as group discussions, storytelling, role-playing, peer learning, and the use of physical teaching aids, are significantly more effective in promoting student engagement than conventional lecture-centered instruction. Students in interactive classrooms were more likely to participate actively, demonstrate greater interest in learning, and engage cognitively with lesson content.

In conclusion, the significant difference in engagement levels confirms that low-tech interactive teaching strategies constitute an effective and practical approach for improving classroom engagement in public secondary

schools, particularly in resource-constrained educational settings.

Discussion

The findings revealed that low-tech teaching strategies significantly enhanced student engagement in public secondary schools. Students taught through collaborative discussions, storytelling, role-play, and physical instructional materials demonstrated higher behavioral, emotional, and cognitive engagement levels than students taught through conventional lecture methods.

These findings support the constructivist perspective, which argues that meaningful learning occurs when learners actively participate in knowledge construction. Similar findings were reported by Byrne (2015), who concluded that pedagogically sound instructional practices are often more influential than sophisticated technological resources. Likewise, Memon and Rashid (2023) found that low-cost instructional materials substantially increased classroom participation among secondary school students.

The significant positive relationship between low-tech strategies and engagement aligns with the findings of Nsengimana and Kotoka (2023), who reported that teaching aids positively influenced students' academic performance and classroom involvement. Similarly, Onyia (2019) found that instructional materials improved students' achievement and retention.

The present study further revealed that behavioral engagement received the highest score among the three dimensions of engagement. This result is consistent with Hassan et al. (2024), who observed that interactive activities such as storytelling and role-playing increased attendance, participation, and classroom enthusiasm among students in resource-constrained schools.

The rejection of the null hypothesis confirms that low-tech instructional strategies are effective alternatives to expensive educational technologies. These findings are also supported by UNICEF (2020), which emphasized that inclusive and engaging learning environments can be developed through pedagogical innovation rather than technological investments alone.

Overall, the study demonstrates that effective teaching depends more on instructional creativity and active learning opportunities than on the availability of advanced technological infrastructure.

Conclusion

The study investigated the role of low-tech teaching strategies in enhancing student classroom engagement in public secondary schools of Hala Taluka. Findings demonstrated that low-tech instructional approaches such as group discussions, storytelling, role-playing, peer learning, and physical teaching aids significantly improve students' behavioral, emotional, and cognitive engagement.

A strong positive relationship was found between the use of low-tech teaching strategies and student engagement. Furthermore, students in classrooms utilizing low-tech interactive methods exhibited significantly higher engagement levels than those in traditional lecture-based classrooms. The study concludes that educational quality and student engagement can be substantially improved through innovative low-tech pedagogical practices, even in schools with limited technological resources. Therefore, low-tech teaching strategies represent a sustainable and cost-effective solution for public secondary schools in resource-constrained settings.

Recommendations

1. Educational authorities should provide professional development programs focusing on low-tech interactive teaching methods.
2. Schools should encourage teachers to use locally available low-cost instructional materials.
3. Teacher education institutions should incorporate low-tech pedagogy into pre-service teacher training programs.
4. School administrators should promote active-learning classrooms instead of lecture-dominated instruction.
5. Government agencies should develop resource kits containing low-cost teaching materials for public schools.

6. Teachers should be encouraged to utilize peer learning, storytelling, debates, and role-play activities regularly.
7. Future researchers should conduct experimental studies to examine the impact of specific low-tech strategies on academic achievement.

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