

EFFECT OF MULTI-GRADE TEACHING ON STUDENT LEARNING AT PRIMARY LEVEL

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ABSTRACT

The challenges of poverty and teacher scarcity in rural areas of Azad Jammu and Kashmir (AJK), particularly in Bagh district, have necessitated the adoption of multi-grade classroom teaching at the primary level, where a single teacher instructs students from two or more grades simultaneously. This study investigates the impact of multi-grade teaching on students' academic performance, learning participation, and social interaction. It specifically examines how combining different grade levels in one classroom influences learning outcomes and classroom engagement. A mixed-methods approach was employed, integrating both qualitative and quantitative data. Five educationalists were interviewed using a semi-structured protocol, alongside classroom observations and teacher-made assessments. The sample consisted of 30 students from Grades 4 and 5. The intervention was based on the official AJK Textbook Board Mathematics curriculum and implemented over four weeks. Pre-tests and post-tests, designed according to Bloom's Taxonomy, were administered to measure learning outcomes. Instructional strategies included group work, peer learning, and differentiated instruction. Data analysis was conducted using SPSS, applying paired sample t-tests to assess within-group improvements and independent t-tests to compare performance between groups. The findings indicate that multi-grade teaching can enhance collaborative learning and social interaction among students. Although challenges related to lesson planning and limited resources were identified, these did not undermine the overall effectiveness of the approach. The study concludes that multi-grade teaching can serve as a viable and productive instructional strategy in resource-constrained settings when supported appropriately. The findings offer valuable insights for policymakers, curriculum developers, teachers, and school administrators aiming to improve primary education in rural contexts.

Keywords: Primary Education, Multi-Grade Teaching, Student Performance

INTRODUCTION

Education is universally recognized as a fundamental human right and a key driver of individual and national development. It plays a vital role in shaping children's cognitive, social, and physical growth while contributing significantly to socioeconomic progress by enhancing human capital and productivity

(Pakistan Economic Survey, 2007–2008; UNESCO, 2003). Ensuring equitable access to quality education, therefore, remains a central responsibility of the state (Khan, 2010). In Pakistan, despite policy commitments such as the Jomtien Declaration on Education for All, challenges such as low literacy rates, teacher shortages, and inadequate infrastructure persist,

particularly in rural and remote regions (Farooq, 1993; Gene, 2005).

In response to these challenges, multi-grade teaching has emerged as a practical and cost-effective instructional strategy. Multi-grade teaching refers to a classroom setting where a single teacher instructs students from two or more grade levels simultaneously (Little, 2001). This approach is widely practiced across both developing and developed countries, especially in areas with low population density or limited educational resources (Mulkeen & Higgins, 2009; UNESCO, 2005). Globally, multi-grade classrooms constitute a significant proportion of primary education systems, facilitating increased access to schooling in underserved regions (Little, 2006).

In Pakistan, particularly in regions such as Gilgit-Baltistan, Chitral, and Azad Jammu and Kashmir (AJK), multi-grade teaching is often a necessity rather than a choice due to teacher scarcity and dispersed populations (Mansoor, 2011). While this approach enables greater access to education—especially for marginalized groups such as girls—it also presents pedagogical challenges, including curriculum integration, classroom management, and individualized instruction (Little, 2005; Bua & Martin, 2020). Nevertheless, research indicates that multi-grade settings can promote peer learning, collaboration, and social development when effectively implemented (Thomas & Shaw, 1992; Jamaladini et al., 2022).

Despite its widespread use, multi-grade teaching remains under-researched and often misunderstood in Pakistan, with mixed perceptions among educators and stakeholders (UNESCO, 2003). Given its growing importance in achieving equitable and inclusive education, there is a need to critically examine its effectiveness, particularly in improving students' academic performance and learning experiences in resource-constrained contexts.

Statement of the Problem

Multi-grade teaching has become a common instructional practice in public primary schools of remote areas in Azad Jammu and Kashmir (AJK), primarily due to persistent issues such as teacher shortages, limited resources, and low student enrollment. Although it provides a

practical solution for ensuring access to education, its effectiveness in enhancing students' academic performance and learning experiences remains debatable. The simultaneous teaching of multiple grade levels poses challenges related to curriculum delivery, classroom management, and individualized attention, which may influence students' cognitive development and social interaction. Therefore, there is a need to systematically investigate how multi-grade instruction affects the academic achievement and social learning of elementary students, and to identify the key factors that determine its effectiveness in the context of AJK.

OBJECTIVES

1. To examine the impact of multi-grade teaching on students' academic performance.
2. To assess the enhancement of social interaction among students in a multi-grade teaching environment.
3. To explore how instructing students from multiple grades in a single classroom influences their learning outcomes and level of participation.

LITERATURE REVIEW

Multi-grade education is an instructional approach in which a single teacher simultaneously teaches students from two or more grade levels within the same classroom. It involves flexible grouping, differentiated instruction, and the use of varied pedagogical strategies to accommodate diverse learning needs. This approach is particularly prevalent in rural and geographically isolated areas where low student enrollment and teacher shortages make single-grade classrooms impractical (Little, 1995; UNESCO, 2003).

Scholars have offered varying definitions of multi-grade teaching, reflecting its diverse implementation across contexts. According to Little (1995), it involves teaching learners of different ages, grades, and abilities together, distinguishing it from mono-grade teaching where learners are relatively homogeneous. Similarly, Vithanepathirana (2006) and PASTEP (2000) define multi-grade teaching as a situation where one teacher manages multiple grade levels within limited instructional time.

Other scholars emphasize the role of curriculum diversity and learner heterogeneity in shaping the concept (Kyne, 2005; Russell et al., 1998).

The lack of a universally agreed definition stems from contextual variations. For instance, in countries like Greece, school classification depends on the number of teachers rather than grade combinations, leading to different interpretations of multi-grade schooling (Brown, 2009). In Asian and African contexts, terms such as multi-level, split-class, or combination classes are often used interchangeably (Birch & Lally, 1995; Baig & Nawab, 2011). Recent studies further conceptualize multi-grade teaching as a learner-centered model that promotes inclusive and adaptive instruction, particularly in resource-constrained environments (Jamaldini et al., 2022; Bua & Martin, 2020).

The growing adoption of multi-grade teaching is closely linked to global efforts to achieve universal education goals such as Education for All (EFA) and the Sustainable Development Goals (SDGs). Multi-grade classrooms provide an effective solution for increasing access to education in sparsely populated and underserved regions, where establishing separate classes for each grade is not feasible (Little, 2006; UNESCO, 2005).

Research indicates that multi-grade teaching addresses several structural challenges, including teacher shortages, limited infrastructure, and uneven student distribution (Brunswic & Valérien, 2004). It also plays a significant role in promoting gender equity, as schools located closer to communities increase enrollment opportunities for girls (Kamal, 2010). In developing countries such as Pakistan, Nepal, and Nigeria, multi-grade teaching has become a practical strategy for expanding primary education coverage (Logue, 2006).

Recent empirical studies highlight that multi-grade classrooms can foster collaborative learning, peer tutoring, and social cohesion among students. For example, Jamaldini, M. A. et al. (2022) found that multi-grade settings enhance individualized learning and student engagement through differentiated instruction. Similarly, Bua, J. D. and Martin (2020)

emphasize that multi-grade teaching promotes critical thinking and cooperative learning, although it demands higher pedagogical competence from teachers.

However, despite its advantages, multi-grade teaching presents notable challenges. Teachers often struggle with curriculum integration, time management, and addressing diverse learning needs within a single classroom (Little, 2005). Studies in Sub-Saharan Africa and South Asia reveal that inadequate teacher training and lack of instructional resources hinder the effective implementation of multi-grade pedagogy (Brown, 2010; Barbetta et al., 2021). Moreover, negative perceptions among parents and educators—often due to misconceptions and lack of awareness—further limit its acceptance (Little, 2005).

Recent research (2020–2024) also points out that technology integration and continuous professional development can significantly improve the effectiveness of multi-grade teaching. Blended learning approaches and teacher training programs have been found to enhance instructional quality and student outcomes in multi-grade classrooms (Ahmad & Akhter, 2021; Barbetta et al., 2021). Additionally, multi-grade education has proven to be resilient in emergency and crisis contexts, such as pandemics or natural disasters, due to its flexible and adaptive structure.

In summary, multi-grade teaching is a globally recognized and contextually driven educational strategy that plays a crucial role in expanding access to education. While it offers significant benefits in terms of inclusivity, collaboration, and resource optimization, its success largely depends on teacher preparedness, institutional support, and effective policy implementation.

METHODOLOGY

The present study adopted a quantitative research approach to examine the effect of multi-grade teaching on students' academic performance in Mathematics at the primary level. A quasi-experimental design, specifically the pretest–posttest nonequivalent control group design, was employed because random assignment of students was not feasible in a natural classroom setting. The independent variable of the study was the teaching method

(multi-grade and mono-grade), while the dependent variable was students' academic performance in Mathematics. The study was conducted at Government Girls Primary School Bilal Colony during the academic year 2023–2024. The population comprised all primary-level students of the school, and a sample of 30 students was selected using intact group sampling, including 15 students from Grade 4th and 15 students from Grade 5th. One group was treated as the experimental group where multi-grade teaching strategies were implemented, while the other served as the comparison group. The researcher herself conducted the teaching to ensure consistency and accurate implementation of the instructional strategies.

The data collection instruments included teacher-made achievement tests consisting of a pre-test and post-test developed in accordance with the Mathematics curriculum prescribed by the AJK Textbook Board. The test items were constructed based on knowledge and comprehension levels of Bloom's Taxonomy and included multiple-choice questions, short-answer questions, and problem-solving items. In addition, an observation checklist was

developed to record students' participation, engagement, collaboration, and interaction during classroom activities.

The data collection process was conducted over four weeks. Initially, a pre-test was administered to assess students' baseline knowledge in Mathematics. Following this, the intervention phase began, during which Grade 4 and Grade 5 students were taught simultaneously using multi-grade teaching strategies such as peer learning, group work, differentiated instruction, flexible grouping, and collaborative problem-solving. Classroom observations were conducted throughout the intervention period. At the end of the intervention, a post-test was administered under standardized conditions to measure students' learning gains. The collected data were analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics including mean and standard deviation were calculated, while paired sample t-test and independent sample t-test were applied to determine significant differences within and between groups. The level of significance was set at 0.05 to determine the effectiveness of multi-grade teaching on students' academic performance in Mathematics.

RESULTS

Table 1. Paired Samples Statistics of Pretest and Post Test

Test	M	N	tvalue	df	p-Value
Pre-test	26.80	30	9.399	29	.000
Post-test	44.77	30			

A paired sample t-test shown that students in the experimental group (multi grade teaching) significantly improved their scores from pre-test. The table suggests that there is a significant difference between the pretest and posttest scores. The experimental group was significantly higher than those of the control group. The mean score increased from (M=26.80, SD=4.902) in the pretest to

(M=44.77, SD=8.127) in the posttest. The p-value of .000 indicates that this difference is statistically significant; suggesting that whatever intervention or change occurred between the pretest and posttest had a substantial impact on the scores. These results indicate that multi-grade teaching had a positive effect on academic performance.

Table 4.2: Group-wise Pretest and posttest Performance (Descriptive Statistics)

Group	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Control	29.53	4.79	42.00	3.22
Experimental	25.67	8.56	45.40	2.65

In this table control group students improved from the average score 29.53 in the ore test to

(Mean= 42.00) in the post test. This suggests a significant academic improvement with single

classroom teaching methods. In the experimental group (multi-grade teaching) students started with a lower average score of (Mean=25.67) but showed a greater increase a posttest average of (Mean=45.40). This reflects a strong positive effect of multi-grade teaching

on students' performance. The SD shows that posttest results in both groups become more consistent especially in the experimental group where variation dropped to 2.65 indicating that most students benefited from the multi-grade teaching method.

Table 4.3: Gender-wise Academic performance (Pretest and posttest)

Group		Gender	Mean	SD
Over all	Pre-Test	Female	27.83	4.63
		Male	24.00	2.33
Control	Post-Test	Female	43.25	3.87
		Male	40.86	2.79
Experimental	Post Test	Female	45.20	2.8
		Male	44.60	1.67

The table shown gender wise academic performance based on the mean and standard deviation of total scores across pre-test, control post-test and experimental post-test. Female students had a higher mean score (Mean=27.83) compared to male students

(Mean=24.00). The mean score in posttest improved for both genders with females averaging (Mean=43.25) and males (Mean=40.86). In posttest experimental group both genders showed further improvements under the multi-grade teaching method.

Table 4.4: Improvement of Grade-Level in Academic Scores

Grade	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Grade4	15	27.00	4.80	44.90	8.10
Grade 5	15	28.00	4.50	46.40	8.20

The table shown grade wise academic performance based on the mean and standard deviation of total scores across pre-test, post-test. Students grade 5 had a mean score (Mean=28.00 SD=4.50) compared to grade4 students (Mean=27.00 SD=4.50). The mean score in posttest improved for both grades

(Mean=44.90 SD=8.10) and (Mean=46.40 SD=8.20). In posttest experimental group both grades showed further improvements under the multi-grade teaching method. However both grades demonstrated academic improvements. Q no2. Does multi-grade teaching enhance social interaction among students?

Table 4.5: Experimental Group Descriptive Statistics.

Indicator	Mean	SD
Shares ideas	3.73	0.70
Participates in group work	4.33	0.62

In this table 4.6 shown Multi-grade teaching significantly enhanced student's social interaction as seen through increased

participation in group work (Mean=4.33). And shares ideas (Mean=3.73) in classroom during studies.

Table 4.6: Multi-grade teaching significantly enhanced students learning

Indicator	Mean	SD
Asks questions	3.47	0.92
Answer Questions	3.87	0.74

In this table 4.6 shown Multi-grade teaching significantly enhanced student's social interaction as seen through increased asks

questions(Mean=3.47). And answer questions (Mean=3.87) in classroom during studies.

Table 4.7: Shown Multi-grade teaching enhanced social interaction

Indicator	Mean	SD
Shows Understanding	4.27	0.70
Helps Classmates	3.67	0.72
Stays focuses	4.07	0.80

In this table 4.7 shown Multi-grade teaching significantly enhanced student's social interaction as seen through increased shows

understanding help classmates and stay focused on their studied.

Table4.8: Shown students participation during learning

Indicator	Before Intervention	After Intervention
Group work	Rarely	Frequently
Peer collaboration	Low	High
Ask answer question	Sometimes	Actively
Independent learning behavior	Minimal	Improved

In this table shown students participation during learning Before the intervention students rarely participation in group work and their level of peer collaboration was low. They were also hesitant to ask questions. However after the introduction of multi-grade teaching there was a significant shift .students were observed to participate frequently in group work showing increased cooperation and teamwork. They engaged more actively in class discussions answer question with greater

confidence ,peer collaboration became strong and students started to show improved independent learning behaviors .These changes reflect the positive effect of multi-grade teaching on students engagement and participation in classroom activities.

Qno3.In what ways does teaching students of different grades in single class room influence their learning and classroom participation?

Table 4.9 Independent T-Test Post Test

Test	Groups	N	Mean	SD	tvalue	df	P-value
Posttest	Control	15	42.13	3.441	10.494	29	.000
	Experimental	15	47.40	1.847			

The experimental group in multi-grade teaching performed significantly better than the control group. This suggests positive effect on learning outcomes. Classroom participation may also be inferred to have improved due to the interaction nature of multi - grade teaching. An independent samples t-test revealed that pretest and posttest scores of the experimental group (Mean=47.40) was significantly higher than those of the control group (Mean=42.13).The p-value of 0.000, which is less than 0.05, we can conclude that there is a statistically significant difference between the

mean scores of the control and experimental groups.

The independent variable (multi-grade teaching) was intentionally applied to assess its effect on the dependent variables. A significant improvement was observed in students test score and classroom behavior in the experimental group. Representing that the multi-grade teaching approach positively partial both academic outcomes and social interaction.

CONCLUSION

In conclusion multi-grade teaching at primary level has both positive and negative effects on students learning. The researcher was only focus on positive effects, it can promote independence, peer learning and leadership skills among students. The effectiveness of multi grade teaching largely depends on the teacher's training and classroom management skills, and availability of learning materials. To enhance student's outcomes in multi-grade settings, support systems, proper teacher preparation and curriculum adjustments are necessary. Teachers' perceptions and reactions about students' learning in multi-grade teaching techniques are statistically poor. In the multi-grade teaching style, the mean value and percentage are extremely low, and the instructor replies were highly significant. When it comes to student engagement in multi-grade courses, the teacher's perspective of such participation is still not very good. According to the instructors' comments, the teaching challenges associated with the multi-grade teaching technique are statistically significant. Teachers' responses to the family approach of teaching several grades don't represent anything. The working conditions of the schools for the multi-grade classrooms are deemed unsatisfactory by teachers.

In multi-grade classrooms, juniors have less opportunity to learn because of the presence of senior pupils, which causes them to become confused and fearful. Teachers were unable to fully focus on every kid in multi-grade classrooms. Students should have greater opportunities to participate in small group projects in multi-grade classrooms. Giving multi-grade instructors specialized training and assistance might help them avoid the difficulties they confront.

RECOMMENDATIONS

1. Provision of Professional Training for Teachers

Teachers working in multi-grade classrooms should be provided with continuous professional development opportunities, including training programs, seminars, and workshops focused on multi-grade teaching strategies. These training initiatives should

emphasize classroom management, differentiated instruction, communication skills, and the effective use of limited resources. Additionally, multi-grade teaching methodologies should be incorporated into pre-service teacher education programs so that teachers are adequately prepared before entering the profession. Proper training will enhance teachers' pedagogical skills, improve instructional quality, and ultimately support better academic performance among students.

2. Provision of Adequate Teaching Resources and Learning Environment

Schools implementing multi-grade teaching should be equipped with sufficient instructional materials such as textbooks, activity kits, charts, and teaching aids for all grade levels. In addition, classrooms should be properly organized with adequate seating arrangements, learning corners, and flexible space to accommodate students of different ages and learning levels. A well-resourced and structured learning environment will support differentiated instruction and enable teachers to manage multiple grades more effectively.

3. Reduction of Teacher Workload through Additional Staffing and Administrative Support

To improve the effectiveness of multi-grade teaching, education authorities should recruit additional teachers, particularly in schools with high student enrollment. Reducing teacher workload will allow educators to provide individualized attention to students and manage curriculum delivery more efficiently. Furthermore, regular monitoring and academic support from education officers and school administrators should be ensured to guide teachers, identify challenges, and improve instructional practices in multi-grade classrooms.

4. Promotion of Collaborative Learning and Community Involvement

Multi-grade classrooms should encourage collaborative learning through peer tutoring, where older students assist younger ones, fostering teamwork and improving learning outcomes. Students should also be guided to

take responsibility for their learning through self-study activities, workbooks, and learning corners. Moreover, parents and community members should be actively involved in school activities and student learning, as their participation can strengthen support systems, enhance student motivation, and improve overall educational outcomes in multi-grade settings.

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