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Platform & Workflow by: [Open Journal Systems](#)**Impact of Professional Development Programs on Teachers' Performance in Multi-Grade Teaching****Mashad Ali Raza**

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gps80tda@gmail.com**Abstract**

This study evaluated the effect of CPD and FLN trainings on primary school teachers in Tehsil Paharpur, District D.I. Khan, Pakistan on the four dimensions of teacher performance: classroom management, instructional skills, teaching practices and classroom assessment, and compared the two training programs on the basis of their impact. The study used a combination of quantitative and qualitative approaches known as concurrent triangulation. From government primary schools in the area of interest, 430 primary school teachers (252 males and 178 females) were drawn from a strata random sampling frame. A Likert scale questionnaire of 40 items was used to collect data. The reliability of the instrument was established at (Cronbach's $\alpha = 0.86$). Sessions of semi-structured interviews were also conducted. Data were analyzed using quantitative and qualitative techniques, i.e., descriptive and thematic analysis, and t-tests. The positive effect of both CPD and FLN trainings on teacher performance was established by the results obtained from the analysis of training impact. Of the participating teachers, 39.33% of females and 39.68% males responded that they had improved their performance 'Often' from CPD, and 22.62% males stated that they had improved their performance 'Always.' From the qualitative interviews, differentiated instruction, effective use of time and increased participation of students were cited. The performance of teachers who received the CPD was compared to the performance of teachers who received the FLN, and the results of the comparative analysis (t-test) showed that there was no statistically significant difference ($p > 0.05$), thus supporting the null hypothesis. Both training models are effective in improving multi-grade teacher performance in the defined domains.

Keywords: Continuous Professional Development, Foundational Literacy and Numeracy, multi-grade teaching, teacher performance, classroom management, pedagogical skills, Pakistan

INTRODUTCION

A country's teachers greatly impact the quality of its education system. In most developing countries, and Pakistan especially in rural and underserved areas, teachers handle multi-grade classrooms. This means they teach students of different grade levels at the same time (Little, 2006). Teaching students of different grades and levels of ability requires certain teaching skills that differ vastly from teaching students of a single grade. These skills include the ability to provide instruction that meets the needs of different students, the ability to organize students in flexible groups, and advanced classroom management skills, among many others.

Effective teaching in these environments is greatly enhanced by a teaching-focused professional development system. Guskey (2002) argues for the importance of engagement in a systematic learning process that improves teaching. This view is also present in Day and Sachs (2004) who argue that the practice of Continuous Professional Development (CPD) assists teachers in learning and reflecting on new teaching strategies in order to teach curriculum that fosters learning and meets the needs of various students.

One successful approach to teaching-focused professional development is the Foundational Literacy and Numeracy (FLN) initiative. UNESCO (2021) notes that FLN programs give teachers the research-based teaching recipes for reading (phonics) and mathematics (activity-based learning) and how to identify and address learning gaps. These skills are especially needed in multi-grade environments to teach students the required grade-level content and support students lacking foundational learning skills.

Teacher participation in professional development programs of reasonable length of time has been shown to lead to better management of the classroom, instructional quality, and engagement of students (Desimone & Garet, 2015). Villegas-Reimers (2003) also noted that CPD allows educators the opportunity to engage in more reflective practice and collaborative work and thus evolves the potential for teachers to construct various strategies to meet the needs of different age groups and learners. Banerji et al. (2022) also provided evidence that suggest targeted professional development and mentoring as a significant contributor toward the improvement of the reading and mathematics skills amongst children.

While these results support the case for the necessity of professional development for multi-grade teachers, the challenges to providing effective professional development for multi-grade teachers are still prominent. Avalos (2011) argued that limited finances, no support, no mentoring, and local problems create obstructions and thus hinder the achievement of effective professional development. The Pakistan National Education Policy (2017) and National Professional Teaching Standards talk about the improvement of teachers and the need for continuous professional development and.) however, specific CPD and FLN programs on the performance of multi-grade teachers are lacking. The current study seeks to fill this void as it examines the impact of the professional development programs on the four dimensions of teacher performance: classroom management, teaching methods, teaching practices, and evaluation of teaching.

OBJECTIVE OF THE STUDY

1. To find out the impact of the Continuous Professional Development (CPD) on teachers' performance in multi-grade teaching.
 - 1a) To find out the impact of the Continuous Professional Development (CPD) on male teachers' performance in multi-grade teaching.
 - 1b) To find out the impact of the Continuous Professional Development (CPD) on female teachers' performance in multi-grade teaching.
2. To find out the impact of the Foundational Literacy and Numeracy (FLN) on teachers' performance in multi-grade teaching.
 - 2a) To find out the impact of the Foundational Literacy and Numeracy (FLN) on male teachers' performance in multi-grade teaching.
 - 2b) To find out the impact of the Foundational Literacy and Numeracy (FLN) on female teachers' performance in multi-grade teaching.
3. To compare the difference between the performances of teachers' having CPD and FLN trainings for multi-grade teaching.

RESEARCH QUESTIONS

1. What is the impact of the Continuous Professional Development (CPD) on teachers' performance in multi-grade teaching?
 - 1a) What is the impact of the Continuous Professional Development (CPD) on male teachers' performance in multi-grade teaching?
 - 1b) What is the impact of the Continuous Professional Development (CPD) on female teachers' performance in multi-grade teaching?
2. What is the impact of the Foundational Literacy and Numeracy (FLN) on teachers' performance in multi-grade teaching?
 - 2a) What is the impact of the Foundational Literacy and Numeracy (FLN) on male teachers' performance in multi-grade teaching?
 - 2b) What is the impact of the Foundational Literacy and Numeracy (FLN) program on female teachers' performance in multi-grade teaching?

Hypothesis of the study

H₀₁: There is no significant difference between the performance of teachers having CPD and FLN trainings for multi-grade teaching.

SIGNIFICANCE OF THE STUDY

This study investigates professional development opportunities to improve the performance of teachers working in multi-grade scenarios. There is a high prevalence of multi-grade teaching in resource-scarce environments, but our understanding of the skills and knowledge required to teach effectively in these contexts is lacking. The outcomes will provide policy makers, educators and planners, as well as training institutions, with evidence-based data for the development of appropriate, flexible professional development programs. Through the analysis of CPD and FLN programs, this research strives to enhance the quality of education, afford equitable learning opportunities, and foster the achievement of Sustainable Development Goal 4 (Quality Education) by supporting teachers' classroom management, teaching practices, and professional development.

DELIMITATION OF THE STUDY

The study was delimited to:

1. Two Professional Development Programs:
 - i. Continuous Professional development (CPD)
 - ii. Foundational Literacy and Numeracy (FLN)
2. Tehsil Paharpur of District D. I. Khan.
3. Male and Female Government Primary School Teachers who received training under the CPD and FLN programs specifically for multi-grade teaching.
4. Variables for teachers' performance were:
 - i. Classroom management skills
 - ii. Pedagogical skills
 - iii. Instructional practices
 - iv. Classroom assessment

REVIEW OF LITERATURE

Theoretical Framework

Two theories are the foundation for this study: Bandura's (1997) Social Cognitive Theory, as well as Adult Learning Theory (Knowles, Holton, & Swanson, 2015). Within Bandura's theory, the enhancement of a teacher's professional development results in the teacher feeling a greater sense of self-efficacy. This sense of self-efficacy results in greater efforts for the teacher in the classroom. Teachers are more likely to utilize innovative methods of instruction if they believe that they are supported and are competent in their practice. From

adult learning theory, relevant "hands-on" professional development experiences that focus on solving real, existing problems, will enhance teacher performance. In scenarios that involve multi-grade instruction, tailored professional development geared toward real-world problems will improve classroom performance and the quality of instruction.

Professional Development and Teacher Performance

Continuous learning experiences provided to educators by a school or district in order to enhance their skills and sharpen their professional practices is what constitutes professional development (Desimone, 2009). Guskey (2002) described effective professional development as continuous learning experiences that emerge and evolve from the needs of teachers and impact the daily work teachers do in the classroom and, ultimately, the impacts that work has on the students. Avalos (2011) indicated that variability in program design affects the measures of improvement in teachers' instructional practices, classroom management, assessment, as well as teachers' belief in their ability to perform the required tasks.

Among the many characteristics of professional development noted by Desimone (2009), content focus, active participation, appropriate length, and relevance to current policy and the school curriculum are most applicable to teaching multiple grades. Teachers who engaged in continuous professional development were more likely to improve the quality of their instruction than teachers who received intermittent, brief periods of professional development (Yoon et al., 2007).

Multi-Grade Teaching: Nature and Challenges

Multi-grade teaching is a method where students from two or more grade levels are taught within the same classroom (Little, 2006). There are a number of additional skills needed above and beyond teaching in mono-grade classrooms. Teachers must deal with a variety of curricula, learning objectives, and assessment units at the same time. Mulryan-Kyne (2005) stated that teachers in multi-grade classrooms are often unprepared to deal with the negative impacts of increased workload, stress and loss of teaching effectiveness.

UNESCO (2015) stated that a lack of multi-grade teaching training results in teacher-centered teaching, low student participation and challenges with class discipline. Berry (2010) stated that planning lessons, managing time, and maintaining student interest were the core challenges that impacted teachers negatively. Unless they receive adequate professional development, teachers usually revert to practices of mono-grade teaching which are inadequate in dealing with multi-grade teaching (Mulryan-Kyne, 2007).

Continuous Professional Development (CPD) and Teacher Performance

Continuous Professional Development (CPD) provides teachers the opportunity to improve and enhance their pedagogy over time (Nasim et al., 2023). CPD is aligned with the principles of adult learning. This includes the importance of relevance; active engagement; and reflection. In a multigrade setting, CPD assists teachers with differentiated instruction, as well as time and group management (Minaz, Baig, & Ali, 2024).

CPD always has a positive impact on the performance of teachers based on the available evidence. Nasim et al. (2023) carried out a survey in Pakistan that showed considerable improvement on the part of teachers with respect to CPD-facilitated planning, instruction, management, and assessment. Similar results were obtained by Naila and Mirwan (2022) when they observed the teachers from Baluchistan who attended CPD and found significant improvements on their knowledge of pedagogy.

Positive results of CPD are observed in other countries as well. Nyaaba et al. (2025) found significant improvement in the quality of instruction, classroom management, and

engagement of students in the Northern Ghana College tutors who underwent CPD. Nzimande (2025) indicated that formal CPD in South Africa increased the quality of teaching for teachers of the foundation phase.

Foundational Literacy and Numeracy (FLN) and Teacher Performance

FLN programs aim to help students develop basic reading, writing, and mathematics skills in the early years of primary school (FLN.org, 2026). These programs comprise teacher training, professional support, reforms to teaching plans, and the improvement of student assessment. The Language and Learning Foundation (2024) has indicated that large-scale FLN initiatives put emphasis on ongoing professional development, workshops and coaching to help teachers reinforce just-in-time instructional strategies and improve their classroom practice.

Full literature search results indicate that primary school teachers had either a moderate or positive perception of FLN projects after they participated in relevant training. For teachers in India, FLN training through the online platform DIKSHA was found to have a positive impact on teacher competency and classroom performances (Mohapatra, 2023). Numerous studies on mission-based foundational learning programs such as Mission Buniyaad, indicate that teachers appreciate the enhancement provided by structured foundational learning programs to their pedagogical practices and engagement with students (Panchal, 2024). Robust professional development based on FLN principles has the potential to improve the performance of practicing teachers in multi-grade classrooms by providing instructional tools and enhancing their confidence.

Comparison of CPD and FLN Trainings on Teachers' Performance in Multi-Grade Teaching

Increased control in multigrade classroom management impacts the performance of teachers in a positive way, as additional professional development opportunities enhance teachers' instructional, classroom management, and pedagogical skills. Continuous Professional Development (CPD) allows teachers to learn constantly in a systematic way and targets covering general teaching skills such as lesson planning, teaching, assessment, and reflective practices (Guskey, 2002; Desimone, 2009). CPD aims to improve the overall performance of the teachers, as it gives them the skills and knowledge to work across the teaching spectrum and across the grade levels. This is most applicable to teaching in multigrade classrooms where teachers interact with students of different levels in the same classroom (Little, 2006).

Training in Foundational Literacy and Numeracy (FLN) focuses on the teaching of early grade reading, writing and numeracy (Language and Learning Foundation, n.d.). FLN programs combine teacher capacity building workshops, instructional coaching, and teaching resources to enhance teachers' ability to teach structured, evidence-based, literacy, and numeracy interventions. FLN training can focus on the early grade teaching competencies and assessment strategies that enhance student literacy and numeracy, and ultimately enhance the confidence of teachers and the accuracy of their teaching (SRF Foundation, 2025).

Examining the effects of CPD and FLN shows that CPD positively affects teachers' ability to plan lessons, organize and manage their classroom and their different classroom levels, whereas the effects of FLN are more lesson-specific, affecting the teaching of literacy and numeracy (Avalos, 2011; Mohapatra, 2023). An example is found in one of the studies done on teacher training within multi-grade classrooms. CPD teachers reported improvement in teaching differentiated and adaptive instruction, as well as positive classroom management. On the other hand, teachers who received FLN training reported

a positive effect regarding the teaching of foundational literacy and numeracy at lower grades, which also affected the learning of their students. Additionally, it affected the teachers' ability to manage multi-grade classrooms in which teaching of foundational skills varied by grade (IJFMR, 2025).

Research Gap

Though there is a lot of research on professional development and teacher performance, not much empirical research has been done on how CPD and FLN programs affect multi-grade teaching in rural Pakistan. Most of the research that has been done looks at either single-grade or urban school teaching, leaving a huge hole in understanding the impact that professional development has on differentiated teaching, classroom management, and assessment in multi-grade teaching. This research tries to fill that hole by studying the effects of CPD and FLN programs on teacher performance in Tehsil Paharpur's multi-grade classrooms on four main dimensions.

METHODOLOGY

Research Design

This study employed a concurrent triangulation mixed-methods design, incorporating both quantitative and qualitative data collection. This approach enabled comprehensive investigation of CPD and FLN programs' impact on teacher performance in multi-grade teaching. Quantitative data were collected through structured questionnaires, while qualitative data were gathered through semi-structured interviews with participating teachers. The concurrent design allowed for methodological triangulation, enhancing the validity and reliability of findings.

Population

The term "population" is used in research contexts other than human beings. The population consisted of all male and female government primary school teachers in Tehsil Paharpur of District D.I. Khan who had been selected for CPD and FLN professional development programs.

Table#3.1 Population Table

Tehsil	Primary Schools		Primary School Teachers	
	Boys	Girls	Male	Female
Paharpur	169	122	503	356
Total	291		859	

Source: District Education Offices (Male/Female) of District: D.I. Khan

Sampling Techniques

Stratified random sampling was used to select the sample of the study. The two strata of the study population were male and female teachers. A straightforward random sampling method was used to select the respondents for quantitative data. In the qualitative section, convenience sampling was used; teachers were selected to participate in structured interviews.

Sample size of the study

According to Babbie (2016), Sample size refers to the number of observations or cases selected from the population for a research study. 252 male and 178 female teachers were chosen as the study sample using L.R. Gay's formula.

Table# 3.2 Sample Size

Teachers (Male)	Teachers (Female)	Total Teachers
252	178	430

Research Instrument

A structured questionnaire was developed based on extensive literature review, comprising 40 items measuring four dimensions of teacher performance:

1. **Classroom Management Skills** (Items 1-10): Seating arrangements, discipline maintenance, time management, activity organization
2. **Instructional Practices** (Items 11-20): Lesson planning, communication, group work, questioning techniques, collaborative learning
3. **Pedagogical Skills** (Items 21-30): Subject knowledge, child-centered methods, innovative teaching, problem-solving strategies, differentiation
4. **Classroom Assessment** (Items 31-40): Formative assessment, feedback, evaluation techniques, peer assessment, learning gap identification

Responses were recorded on a 5-point Likert scale: 5=Always, 4=Often, 3=Sometimes, 2=Rarely, 1=Never.

Instrument Validation

Content validity was established through expert review by three education specialists from Gomal University. The instrument was pilot-tested with 30 multi-grade teachers not included in the final sample. Cronbach's alpha reliability coefficients for each variable were

Table# 3.3 Internal Consistency of Tool (Variable Wise)

Variable	Items	Cronbach's Alpha
Classroom Management	10	0.87
Instructional Practices	10	0.85
Pedagogical skills	10	0.88
Classroom Assessment	10	0.86
Overall	40	0.86

Data collection Procedure

The researcher was authorized to conduct this study by the relevant education authorities. The researcher physically collected the questionnaire from a selected set of teachers in both boys' and girls' schools after obtaining their consent. Selected participants were interviewed to gather qualitative perspectives.

Data Analysis Technique

The percentage, mean, and standard deviation were used for descriptive analysis, T test was used for inferential statistics to ascertain whether the opinions of male and female school teachers differ significantly. Thematic analysis was used to interpret the responses from structured interviews.

DATA ANALYSIS AND INTERPRETATION

Quantitative Data Analysis

Research Question 1: Impact of CPD on teacher performance

Table 1: Classroom Management for CPD and FLN teachers

Programs	Gender	Options										Total
		N		R		ST		O		A		
		No	%	No	%	No	%	No	%	No	%	
CPD	Males	10	3.97	25	9.92	60	23.81	100	39.68	57	22.62	252
	Females	8	4.49	20	11.24	50	28.09	70	39.33	30	16.85	178
FLN	Males	1	4.35	2	8.70	5	21.74	10	43.48	5	21.74	23
	Females	0	0	1	5.88	3	17.65	8	47.06	5	29.41	17

Most teachers manage students across multiple grades. In Table#1, the majority of CPD male and female teachers said they could do so 'Often' (39.68 percent, 39.33 percent respectively). They also said 'Sometimes' and 'Always' Similarly for FLN teachers, both male and female, said they 'Always' (21.74 percent and 29.41 percent respectively) and 'Often' (43.48 percent and 47.06 percent, respectively) said they would personally manage students across multiple grades. These statistics indicate the level of confidence professional teachers have in able to manage students across grade levels, and more specifically, that FLN teachers have a higher confidence level.

Table 1.1: Classroom Management for CPD and FLN teachers

Teacher Category	Gender	N	Mean	SD	t-Calculated	df	P-value
CPD Teachers	Male	252	3.67	1.06	1.39	428	.166
	Female	178	3.53	1.04			
FLN Teachers	Male	23	3.70	1.06	0.99	38	.325
	Female	17	4.00	0.87			

Table #1.1 examines the performance of CPD and FLN teachers based on their gender and how they cope with children of different levels in a single class. Male CPD teachers (M = 3.67, SD = 1.06) had slightly higher mean scores than female teachers (M = 3.53, SD = 1.04); however, the difference was not statistically significant (t = 1.39, df = 428, p = .166). For FLN teachers, the results also indicate that female teachers (M = 4.00, SD = 0.87) outperformed male teachers (M = 3.70, SD = 1.06), but the results also showed that the difference was statistically insignificant (t = 0.99, df = 38, p = .325). Generally, the results of the study show that the professional development training provided to male and female CPD and FLN teachers was successful in helping them deal with a multi-level classroom, and also showed no difference between men and women.

Table 2: instructional Practices for CPD and FLN teachers

Programs	Gender	Options										Total
		N		R		ST		O		A		
		No	%	No	%	No	%	No	%	No	%	
CPD	Males	26	10.3	38	15.1	64	25.4	80	31.7	44	17.5	252
	Females	15	8.4	27	15.2	55	30.9	53	29.8	28	15.7	178
FLN	Males	2	8.7	4	17.4	6	26.1	7	30.4	4	17.4	23
	Females	1	5.9	3	17.6	5	29.4	5	29.4	3	17.7	17

Table #2 shows the surveyed teaching practices of multi-grade teachers. Regarding CPD teachers, most of the men (31.7% and 29.8%) and women (25.4% and 30.9%) said they had reported practicing Often (47.1% and 47.1%) or Sometimes (25.4% and 30.9%) or Always (17.5% and 15.7%). The findings were consistent for FLN teachers. Again, Often was the dominant response, given by 30.4% of the men, and 29.4% of the women; Always was chosen by 17.4% of the men and 17.7% of the women. Overall, this research indicates that professional development courses equip teachers with various instructional strategies to cater to the wide range of multiple-grade students.

Table 2.1: instructional Practices for CPD and FLN teachers

Teacher Category	Gender	N	Mean	SD	t-Calculated	df	P-value
CPD Teachers	Male	252	3.36	1.20	0.37	428	.710
	Female	178	3.32	1.18			
FLN Teachers	Male	23	3.26	1.18	-0.10	38	.922
	Female	17	3.29	1.18			

Table#2.1 shows how CPD and FLN teachers used various teaching strategies in multi-grade classes based on gender. Among CPD teachers, male teachers ($M = 3.36$, $SD = 1.20$) had a slightly higher mean score than female teachers ($M = 3.32$, $SD = 1.18$), but this was not a statistically significant difference ($t = 0.37$, $df = 428$, $p = .710$). The same applied to female teachers ($M = 3.29$, $SD = 1.18$) versus male teachers ($M = 3.26$, $SD = 1.18$); this mean score difference was also not statistically significant ($t = .10$, $df = 38$, $p = .922$). The overall results of the study show that the received professional training did not allow the teachers to perceive a significant difference in terms of gender, and female and male teachers were able to utilize a variety of teaching instructions in multi-grade classes.

Table 3: Pedagogical skills for CPD and FLN teachers

Programs		Gender		Options								Total
		N		R		ST		O		A		
		No	%	No	%	No	%	No	%	No	%	
CPD	Males	20	7.9	35	13.9	70	27.8	85	33.7	42	16.7	252
	Females	15	8.4	25	14.0	55	30.9	55	30.9	28	15.7	178
FLN	Males	2	8.7	3	13.0	6	26.1	6	26.1	6	26.1	23
	Females	1	5.9	2	11.8	4	23.5	5	29.4	5	29.4	17

Table#4.21 shows the reported explicitness of teachers regarding the concept of multi-grade teaching pedagogy. CPD teachers found most men (33.7) and women (30.9) frequently said they were frequently followed by sometimes (27.8 and 30.9) and always (16.7 and 15.7). Among FLN teachers, both men and women reported an Always (26.1% and 29.4% respectively) and were followed by Often (26.1% males and 29.4% females) as the next highest frequency response. These results indicate that multi-grade teaching pedagogy is more clearly understood with professional training, and that FLN teachers are somewhat more consistent in coming to this conclusion than CPD teachers.

Table 3.1: Pedagogical skills for CPD and FLN teachers

Teacher Category	Gender	N	Mean	SD	t-Calculated	df	P-value
CPD Teachers	Male	252	3.37	1.19	0.14	428	0.889
	Female	178	3.35	1.20			
FLN Teachers	Male	23	3.48	1.22	0.44	38	0.661
	Female	17	3.41	1.21			

Table#3.1 provides some information on the perception of multi-grade teaching among the CPD and FLN teachers grouped by gender. For the entire sample, the mean score was slightly higher for the male teachers (mean = 3.37, SD = 1.19). However, this score difference was not significant when compared with female teachers (mean = 3.35, SD = 1.20), $t = 0.14$, $df = 428$, $p = 0.889$. For the FLN teachers, male teachers (mean = 3.48, SD = 1.22) also had a slightly higher mean score compared with female teachers (mean = 3.41, SD = 1.21) which was not statistically significant. Overall, the results suggest that the professional development training on multi-grade teaching improved male and female CPD and FLN teachers' knowledge of this teaching, and there were no gender differences in this knowledge.

Table 4: Classroom Assessment for CPD and FLN teachers

Programs		Gender		Options								Total
		N		R		ST		O		A		
		No	%	No	%	No	%	No	%	No	%	
CPD	Males	21	8.3	35	13.9	67	26.6	82	32.5	47	18.7	252
	Females	12	6.7	24	13.5	50	28.	55	30.9	37	20.8	178
FLN	Males	1	4.3	2	8.7	6	26.1	7	30.4	7	30.4	23
	Females	0	0	1	5.9	5	29.4	5	29.4	6	35.3	17

Formative assessment is used frequently by teachers as seen in Table 4.31. Most male (32.5) and female (30.9) CPD teachers said Often with Somewhat (26.6% and 28.1%) and Always (18.7% and 20.8%). For FLN teachers, more males (30.4%) and females (35.3%) said Always which shows a higher tendency to use formative assessment constantly. The data also show that CPD teachers and FLN teachers who receive professional development are more likely to engage in the regular use of formative assessment in multi-grade classes and demonstrate a slightly higher consistency in use.

Table 4.1: Classroom Assessment for CPD and FLN teachers

Teacher Category	Gender	N	Mean	SD	t-Calculated	df	P-value
CPD Teachers	Male	252	3.49	1.21	-0.39	428	0.696
	Female	178	3.52	1.22			
FLN Teachers	Male	23	3.61	1.26	0.20	38	0.843
	Female	17	3.59	1.24			

Table#4.1 provides a gender analysis of CPD and FLN teachers in terms of their use of formative assessment. The mean score for female CPD teachers ($M = 3.52$, $SD = 1.22$) was found to be slightly more than for male CPD teachers ($M = 3.49$, $SD = 1.21$), although the results were not statistically significant ($t = -0.39$, $df = 428$, $p = 0.696$). Similar results were observed in FLN teachers. Here, the mean score for male FLN teachers ($M = 3.61$, $SD = 1.26$) was also found to be slightly more than for female FLN teachers ($M = 3.59$,

SD = 1.24), and the results, once again, were not significant ($t = 0.20$, $df = 38$, $p = 0.843$). Overall, the results indicated that male as well as female CPD and FLN teachers, through the provision of professional development training, were able to engage in the implementation of formative assessment, and the differences between them were not notable.

Thematic Analysis.

The results of the interview were thoroughly analyzed and coded to identify key concepts in the teachers' experiences with CPD and FLN training programs. The similar responses were clustered to identify themes.

Themes	Codes
Classroom management skills	➤ Group organization ➤ Classroom rules and discipline ➤ Seating plan ➤ Peer learning
Pedagogical skills	➤ Group work ➤ Activity-based learning ➤ Instructional strategies & differentiated instructions ➤ Phonics
Instructional practices	➤ Lesson planning ➤ Time management ➤ Teaching aids ➤ Literacy practices
Classroom Assessment	➤ Oral questioning ➤ Quizzes & Tests ➤ Individual feedback ➤ Monitoring
CPD & FLN Comparison	➤ Teaching approaches ➤ Teaching techniques ➤ Basic mathematics ➤ Literacy skills

Research Questions & Interview responses

1. RQ#1 What is the impact of CPD on teachers' performance in multi-grade teaching? &
2. RQ#2 What is the impact of FLN on teachers' performance in multi-grade teaching?

Theme#1 Classroom Management skills

Based on the interviews, teachers thought that professional development programs helped them enhance their classroom management skills in multi-grade classrooms. Before the training, teachers said it was hard to deal with different grade levels in one classroom. Still, they were able to follow better strategies for keeping order and categorizing classroom activities after doing CPD and FLN courses. Many teachers stressed the importance of setting routines and rules in the classroom.

One teacher stated, "Prior to the training, I couldn't easily control students from other classes in the same class. Following the completion of the CPD and FLN training, I learned about forming groups of students and establishing class rules which enhanced my ability to maintain discipline". (T-1)

Another important factor in controlling students was varying grouping and seating arrangements. One teacher stated, "I group students based on their grades in order to

monitor the learning process, and I sometimes organize students to work in groups so that the more able students help the less able students". (T-3)

Another teacher noted the benefit of organizing students to work in a peer tutoring arrangement as a means of class discipline, "When I am teaching one grade, the other students work in groups or are doing activities individually. This helps keep the classroom busy". (T-6)

The teachers also noted the benefit of the training on their ability to issue clear instructions to a single grade. One teacher noted, "Before I can teach the lesson, I give individual activities to the grades, which keeps the students busy and reduces disturbance in the class". (T-9)

Overall, the responses to the question indicate a strong positive influence of the CPD and FLN training programs on the classroom management of teachers of multi-grade classes.

Theme#2 Pedagogical Skills

It was also noted during the interviews that certain professional development programs helped to develop the pedagogical skills of teachers. Teachers indicated that they found confidence in teaching methods appropriate for multi-grade classes. One teacher said, "Following FLN training, I will be more confident to use different teaching strategies that are relevant to learners of other grades" (T-2).

Teachers said that students in multi-grade classes have different levels of academic learnings and differing capacities. In this respect, teachers said, "Students of different grades have different levels of learning. I try to use the teaching methodology that is based on learning activities in order to provide a way for every student to participate in the learning process." (T-4)

Some teachers said that the training introduced them to using teaching methods that are student-centered. "The training has changed our perception into the use of group discussions and learning activities rather than the common teaching method of lecture." (T-7)

Another teacher said, "I have now the ability to use my strategies of instruction based on the learning needs of the students. The training improved my strategies of teaching." (T-10)

From the reactions of teachers, it can be inferred that professional development programs helped teachers' understanding of effective pedagogical practices for teaching at multiple grades, in the process, broadening their scope on teaching.

Theme#3 Instructional Practices

Improvement in teacher instructional practices in the responses of the interview also showed that teachers who participated in training programs enhanced their practices. As described by the respondents, training programs helped them to better plan and organize their lessons and teaching activities covering different grade levels.

An example of a teacher describing planning is as follows: "The training assisted me in planning my lessons in advance. I now plan individual activities according to each grade prior to going in the classroom." (T-1)

The teachers also mentioned the positive effect of peer tutoring in multi-grade classes. One teacher stated: "Peer tutoring is highly beneficial in multi grade classes. Younger students are assisted in comprehending the lesson by older students." (T-5)

Along the same line, another teacher stressed the positive effect of group work as it "allows the students to learn through each other" and helps him "to manage different grades" (T-8)

Despite all these advances, teachers also described challenges in the application of different teaching methods. "There are not enough time and students are very numerous, sometimes it is challenging to concentrate on all grades." (T-4)

The teachers' views illustrate that although training programs positively impacted instructional practices, there are other classroom management issues that are associated with the available resources and time.

Theme#4 Classroom assessment.

Teachers also stated that they had become better at classroom assessment during the process of professional development training. They described assessment as being significant in determining the progress of students and their learning deficits.

One teacher stated: *"I apply quizzes and oral questioning to test the understanding of students in various grades"*. (T-2)

Another teacher explained: *"Assessment can allow me to see where students require my further assistance"*. (T-6)

The teachers insisted on giving proper feedback *"Feedback should be different between students of various grades. I mentor them to their learning levels"*. (T-7)

In addition, educators said that they used the outcomes of the assessments to facilitate their teaching. *"I would be able to define weak areas of students when I analyze their results and alter my teaching strategies."* (T-9)

These reactions show that training interventions assisted teachers to be more systematic and effective in assessing in multi-grade classes.

Theme#5 Comparison of CPD and FLN Training.

It was also in the interview responses that the perception of teachers on the effectiveness of CPD and FLN training programs was examined. As a whole, teachers felt that both programs were good but they emphasized on different areas in teaching. One teacher explained that *"CPD training allowed me to become better in my overall teaching techniques and classroom management"*. (T-4)

The other teacher emphasized the positives of FLN training. *"FLN training was quite helpful in teaching the reading and basic mathematics skills. Another point that was highlighted by teachers is that both training programs are complementary to one another"*. (T-5)

A teacher said that *"Both trainings are useful. CPD dwells on teaching approaches, whereas FLN deals more with literacy and numeracy"*. (T-8)

Equally, another teacher remarked: *"When the two types of trainings are merged, they can significantly enhance teaching in multi-grade classes and the learning of students"*. (T-10)

These reactions show that educators view CPD and FLN programs as the additional professional development strategies that may help to enhance the effectiveness of teaching.

Overall Results of the Qualitative Data.

The qualitative results demonstrated that the CPD and FLN professional development programs have positively affected teachers' performance when teaching multiple grades in a single classroom. Teachers indicated that they had enhanced classroom management, pedagogical abilities, instructional practices, and classroom assessment practices. Even though educators stated that some issues were related to resources and classroom settings, they stressed that training sessions significantly improved their professional skills. These data are consistent with the quantitative ones and reveal the significance of professional development programs in enhancing the effectiveness of multi-grade teaching.

Triangulation of Results

In this study, the triangulation of quantitative data and qualitative data from interviews with teachers added to the credibility and validity of the findings. The triangulation was

done to determine the level of concordance between teachers' reported self-perceptions and the actual statistical data on the effect of Continuous Professional Development (CPD) and Foundational Literacy and Numeracy (FLN) training on teachers' performance in a multi-grade classroom.

The triangulated analysis shows convergence between the interview data and the quantitative data. Both CPD and FLN training have a significant positive impact on the teaching performance of teachers in multi-grade classrooms, and the gender effect is not significant. The presence of both qualitative and quantitative data contributes to the credibility and validity of the study conclusions.

The triangulated data demonstrates a high degree of alignment between the qualitative and quantitative data on the effect of CPD training on teachers' performance. Interviewees indicated that the CPD training made teachers feel more confident, better prepared, and able to manage classroom teachers of multiple grade levels. This is consistent with the evaluation data, which indicated that CPD trained teachers had moderately high to high mean scores in the overall management of the classroom, discipline, time, seating, and group work, and peer learning. In addition, t-test scores indicated no statistically significant differences between males and females, supporting the interview participants' statements that CPD was appreciated by all teachers, regardless of gender.

Data triangulation for FLN training indicates a high degree of convergence when it comes to the responses from interviews and from surveys. Teachers who went through the FLN training reported that it positively affected their practice and was especially helpful in the provision of basic skills in literacy and numeracy, the identification of learning gaps, and the use and integration of formative assessment and teaching/learning differentiation. These views were also substantiated by the quantitative data where FLN teachers tended to select the response options of 'Often' and 'Always' for the instructional and the assessment-related dimension variables and, in the process, exhibited more response consistency than their CPD teacher counterparts. This convergence indicates that FLN training positively impacts instruction in multi-grade classes.

Another result of the triangulation analysis draws a positive relationship between FLN and CPD training programs. From the interview data, the CPD training is more effective in improving the discipline and the management of the classroom, while the FLN training is more effective in improving the quality of the delivery of instruction and the engagement of the learners. The qualitative data are substantiated by the quantitative results. The variables associated with the CPD have a greater impact on the management dimension, while the variables associated with the FLN are more consistent in the instructional and assessment domain.

Even though the two sources don't entirely align on every point, they both agree that gender has very little impact on teachers' performance post-CPD or FLN training. The interview subjects claimed that they had not seen a performance discrepancy between male and female teachers. This is corroborated by the fact that almost all of the variables under study showed statistically insignificant gender differences. This corroboration provides evidence that both genders can be trained via professional development programs.

The analysis of the triangulation of methods illustrates that qualitative interview and quantitative questionnaire data both demonstrate an improved performance of teachers after CPD and FLN training in the context of multi-grade classes. Triangulation, in addition to strengthening the findings of the research, provides an integrated view of the enhancement that professional development programs foster of classroom management and teaching practices

Discussions

The objective of this study was to analyze the impact of Continuous Professional Development (CPD) and Foundational Literacy and Numeracy (FLN) training on teachers working in multi-grade classes. It was found that both forms of professional training strengthen the teaching, managerial, and pedagogical skills of teachers and complement previously documented research regarding structured professional training and its relevance in addressing the challenges of teaching in complex setting.

As the analysis indicates, the FLN and CPD training, in conjunction, have been viewed by teachers as a suitable framework for managing multi-grade classes. The teachers were found to have moderate to a high level of agreement (3.30 to 3.70) when assessing the main indicators of the ability to plan classes, and maintain discipline and engagement of the learners, which was also observed when assessing the impact on overall performance. This supports Kennedy (2016) and Darling-Hammond et al., who claim that the competence of teachers working with multi-grade classes can be substantially improved by the application of classroom management and differentiated instruction.

The amount of theorizing, linked with practice, verifies that teachers are learning and using new skills. This finding is also consistent with the professional development model proposed by Guskey (2002), which suggests that a professional development training program is effective if it alters teachers' practice and class activities.

The analyses of CPD teachers by gender revealed minor distinctions in performance of both male and female teachers, with all t-tests showing non-significant results ($p > .05$). While men tended to be slightly better in discipline and in handling disruptive behavior, women, on the contrary, scored better in planning and maintaining smoothness in the execution of activities. These minor distinctions show that CPD programs provide a platform for both genders of teachers, and this believes is reinforced by the fact that when professional development programs are devised in a phased-based manner, they can help reduce gender disparities in teaching (Akyeampong et al., 2011). It is consistent with the body of research that suggests that gender is a weak predictor in measuring the performance of teachers when systematic professional development is sustained (OECD, 2019). As such, CPD programs could be considered gender neutral programs aimed at enhancing the effectiveness of teaching in multi-grade contexts.

The results of FLN training for male and female teachers, on the other hand, were equally positive. Scores in all the FLN domains were above 3.20, which shows an overall sense of positive self-efficacy regarding the ability to handle multi-grade classrooms. Once again minor differences were apparent. Women were slightly better at handling the progression of multi-grade classrooms, while men were marginally better at controlling disruptive behavior. All these differences were again statistically insignificant, and it is fair to say that FLN training is as helpful for both genders.

The research provides evidence surrounding the role of FLN programs and the challenges of vertical teaching. Issues such as moving through multiple levels and catering to the different needs of different learners within the same class arise in vertical teaching (UNESCO, 2015). Many programs focus on teaching vertical teaching. They offer different strategies from the perspective of differentiation, classroom organization, and teaching methods. Challenges are likely to be reduced where differentiation, integration, and classroom engagement are effectively applied.

The study found that, despite parallel performance outcomes, differences existed. For example, the teachers who took the FLN programs scored slightly higher with respect to managing multiple levels, ensuring smooth transitions, and maintaining order in the

classroom. In other regards, the CPD teachers showed equally good performance because the programs offer a complete package and include instructional and classroom management training.

The results indicate that, though FLN training may be slightly superior in some respects of training, both FLN and CPD training are effective in preparing teachers to teach in a multi-grade setting. This, in turn, corroborates the theory that different frameworks of professional development, either pedagogical or subject domain, have the potential of enhancing teachers' performance (Desimone, 2009).

This research substantiates the claim that a professional development program is a necessary step for improving the quality of teaching in complex settings. Having undergone an organized, sequenced training, teachers are better positioned to satisfy the diverse needs of their students, regulate the classroom, and ensure that the instruction is seamless, which in turn is beneficial to the students' academic achievement

Conclusion

This paper analyzed the significance of Continuous Professional Development (CPD) and Foundational Literacy and Numeracy (FLN) training on teacher performance in understanding multi-grade teaching. FLN and CPD improve pedagogical, managerial, and instructional skills, thereby enabling the teacher to handle the requirements of teaching in a multi-grade class. Class teachers observed functioned at relatively high levels of classroom discipline, instruction, and student behavior and flow in organized grade-based activities. Overall, professional training equipped teachers with methods and techniques that can be used to manage complex situations in the classroom.

The importance of organized professional training in CPD and FLN is fundamental in enhancing teacher effectiveness in teaching in a multi-grade class and improving the quality of the teaching and learning process. Professional development is an important aspect of teaching multi-grade classes. Both FLN and CPD training enhance teachers' professional practices in multi-grade classes. Both training programs contributed greatly to professional practices in multi-grade settings and neither of the two training programs showed any significant difference based on the gender of teachers who participated in the programs. The importance of organized professional training in CPD and FLN is fundamental in enhancing teacher effectiveness in teaching in a multi-grade class and improving the quality of the teaching and learning process.

The gender-based analysis demonstrated no statistically important difference between male and female teachers within the CPD or FLN groups. Although subtle differences did appear in some average scores, they were not statistically important and did not show gender-based differences in training effectiveness. This result indicates that systematic professional development programs positively impact all teachers, regardless of gender. Results from a research analysis between CPD and FLN training demonstrated the two programs to be equally effective. The training programs showed variations mainly in the areas of multiple grading and discipline. Overall, in the performance of both groups, the difference was minimal, showing that training programs are effective in developing teachers' ability to teach in more than one grade.

It can be affirmatively stated that the first tier of well-designed professional development, CPD or FLN programs, is a critical element for educational policy makers, as well as school administrators, in enhancing teacher effectiveness and improving the organization of the classroom and instruction in multi-grade classrooms

Recommendations

Following were the recommendations of the study:

1. Teachers may be trained regularly through CPD and FLN programs so that they can enhance their skills in teaching multi-grade classes.
2. Equal opportunities may be provided to male and female teachers for their professional development.
3. Continuous monitoring and support may be provided to achieve effective teaching in a multi-grade classroom.
4. Multi-grade teaching specific modules may be provided by training programs in which teachers exchange their teaching practices and experiences.

Guidelines for future research

Following guidelines were suggested for future researchers:

1. Research may be conducted on other districts of Khyber-Pakhtunkhwa
2. Variables may be included in future research, such as motivation, leadership, and students' learning outcomes, etc.
3. Comparative studies may be conducted on single-grade and multi-grade teaching.

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