

Continuous Professional Development (CPD) Pilot for Elementary School Teachers (ESTs)

Pilot Report

Khyber Pakhtunkhwa

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List of Abbreviations

ADDIE	Analysis, Design, Development, Implementation, and Evaluation
B-TAG	Bridging Technical Assistance for Governments
COP	Communities of Practice
COT	Classroom Observation Tool
COVID-19	Coronavirus Disease of 2019
CPA	Concrete-Pictorial-Abstract
CPD	Continuous Professional Development
D&ESE	Directorate of Elementary and Secondary Education
DCTE	Directorate for Curriculum and Teacher Education
DEO	District Education Officer
DPD	Directorate for Professional Development
ECF	Early Career Framework
EST	Elementary School Teacher
E&SED	Elementary and Secondary Education Department
HT	Headteacher
KP	Khyber Pakhtunkhwa
LMS	Learning Management System
MTs	Master Trainers
OECD	Organisation for Economic Cooperation and Development
PBL	Project-based Learning
PLC	Professional Learning Communities
RPDC	Regional Professional Development Centre
SLOs	Student Learning Outcomes
SE	Subject Expert
TALIS	Teaching & Learning International Survey
TMS	Training Management System
TOT	Training of Trainers

UK

United Kingdom

Executive Summary

The Continuous Professional Development (CPD) initiative for Elementary School Teachers (ESTs), launched in collaboration with the Directorate for Professional Development (DPD) aims to improve teaching quality in elementary schools across KP. The report outlines the key steps implemented to pilot the CPD framework in KP and the progress so far.

The CPD framework for ESTs recognises the pivotal role of teacher quality in driving student achievement and aims to address the gaps in training and pedagogical support available to ESTs. The framework was developed in collaboration with key provincial bodies, including the Elementary and Secondary Education Department (E&SED), the Directorate for Professional Development (DPD), and the Directorate for Curriculum and Teacher Education (DCTE).

The CPD model employs a blended approach, integrating synchronous and asynchronous learning opportunities. It is centred on four core activities: **Personal Learning Hours** for self-directed study, **Teacher Learning Forums** for collaborative learning, **Classroom Observations** to provide structured feedback, and **Professional Learning Communities** to foster peer support and continuous improvement. These components are designed to provide sustained, targeted professional development tailored to subject-specific needs in English, Mathematics, and Science.

The pilot programme was implemented across six districts—Malakand, Charsadda, Orakzai, Kohat, Nowshera, and Battagram—reaching out to 1,517 teachers (812 male and 705 female) from 554 middle schools (272 male, 282 female). Key interventions included development of digital modules, accessible via a Learning Management System (LMS) for self-paced learning, subject-specific training for headteachers and subject experts, and the deployment of a customised Classroom Observation Tool (COT). The digital modules featured lesson plans, instructional videos, and assessment tools aligned with student learning outcomes (SLOs).

To support teachers with on-the-job training, 526 headteachers (306 male and 220 female) were trained in August 2024, on the use of the COT. This training equipped them with skills in feedback delivery, mentoring, coaching, and teacher motivation. Additionally, 73 Subject Experts (36 male and 37 female) in English, Mathematics, and Science received training to conduct online learning forums informed by data from classroom observations and teacher performance in CPD modules. The results from pre- and post-training assessments revealed notable improvements in subject experts' content knowledge. In Mathematics, scores increased from 6.96 to 8.42; in science, they improved from 6.04 to 7.44; and in English, scores rose slightly from 7.09 to 7.18.

As part of pilot evaluation, Classroom observations were conducted before the pilot by independent observers across a sample of 59 schools, covering 354 observations of teaching practices in English, Mathematics, and Science. The average scores for teaching practices were 3.53 for English, 3.51 for Mathematics, and 3.31 for science on a 1-5 Likert scale. Similar observations will be conducted in March at the end of the intervention to see difference in teaching practices as a result of the intervention.

As part of CPD-ESTs pilot framework, the first professional development forum was held in Malakand on 26th October, bringing together teachers, headteachers, subject experts, and education officials. The forum provided a collaborative platform for participants to showcase innovative teaching practices, share experiences, and strengthen Professional Learning Communities. Breakout sessions focused on subject-specific pedagogy and best practices, fostering sustained professional growth.

Section 1 – Introduction

Quality education is a fundamental right of every child, and its achievement is intrinsically linked to the quality of teaching. Research has consistently demonstrated that enhancing teacher quality is the most effective strategy for improving student learning outcomes (Evans, Beteille, 2018). A high-quality education system necessitates that teachers are well-trained and equipped with the requisite knowledge, skills, and continuous support to adapt to evolving educational standards and pedagogical practices. Elementary teachers play a critical role in students' academic progress, especially due to enhanced subject-specific rigour. Hence, there is a need for an extensive Continuous Professional Development (CPD) programme aimed at improving teachers' skills and the resultant impact on student performance.

The Government of KP has recognised the critical importance of teacher development and has initiated various efforts in this regard. So far, these initiatives have predominantly focused on primary education, leaving ESTs underserved, potentially leading to teacher proficiency disparities. Although progress has been made through initiatives targeting primary educators since 2017, a comprehensive strategy specifically addressing the needs of elementary school teachers has been lacking.

CPD-ESTs Framework

This CPD-EST framework is designed to provide professional learning opportunities to elementary school teachers directly aligned with their needs. The programme incorporates findings from successful international practices, ensuring that the framework is both contextually appropriate and informed by evidence-based strategies. The pilot programme has been implemented in six districts—Malakand, Charsadda, Orakzai, Kohat, Nowshera, and Battagram — involving 1,517 teachers (812 male and 705 female) from 554 middle schools (272 male, 282 female).

The report outlines the structure and methodology of the CPD programme, presents data collected during the pilot, and provides detailed progress so far. The pilot study's outcomes are intended not only to assess the current framework but also to provide recommendations for refining and expanding the CPD model.

Key Attributes of CPD Design for ESTs

While designing CPD model for ESTs, the following key considerations have been taken into account:

- i. CPD for ESTs is built on the foundations of the current policy space tapping the already available synergies of different institutes, making it more sustainable.
- ii. Teachers' professional development needs are established through the collection of reliable and relevant data
- iii. The CPD model for ESTs uses new infrastructure for learning and development in the province. This includes Training Management System (TMS) being developed by PITB for providing CPD training through a blended learning approach.
- iv. A CPD intervention significantly contributes to the development of teachers' knowledge and skills to teach the curriculum effectively. Hence, the CPD model aligns with the curriculum requirements.

CPD-ESTs Activities

The CPD model for ESTs in KP consists of the following four activities:

- i. **Personal learning hour:** Self-study through lesson plans and videos disseminated through the LMS to Elementary School Teachers.
- ii. **Classroom Observations:** Observation and feedback sessions by HTs and Subject Experts on subject-specific Classroom Observation practices.
- iii. **Teacher Learning Forums:** Asynchronous and synchronous online learning forums moderated by Subject Experts, informed by teacher performance data.
- iv. **Learning Communities:** Subject-specific teacher communities.

Section 2 – Literature Review

CPD programmes have been proven to enhance teacher effectiveness and, consequently, improve student learning outcomes. Numerous studies emphasise that sustained, targeted, and context-sensitive professional development is crucial for transforming teacher performance (Darling-Hammond et al., 2017). Internationally, CPD models emphasise alignment with both teachers' instructional needs and national curriculum frameworks. An effective teacher training programme must be based on participants' needs (Tapilouw et al., 2017). The OECD's TALIS report (2019) suggests that effective CPD must address real-time challenges faced by teachers in the classroom, incorporating formative assessments and feedback mechanisms to monitor progress. In countries renowned for their educational systems, such as Singapore and Finland, CPD frameworks focus on continuous learning cycles, peer collaboration, and reflective practice. These frameworks encourage teachers to engage in self-directed learning, often facilitated through professional learning communities (PLCs) that promote ongoing discussion and collaborative problem-solving (Schmidt & Prawat, 2009). These PLCs foster professional growth, build peer support, and offer practical solutions to classroom challenges.

Flexibility and accessibility are also critical elements of a successful CPD programme. Research shows that professional development that is modular, blended (combining in-person and virtual training), and locally accessible leads to higher participation levels and sustained learning outcomes (Cordingley et al., 2015). For example, the expansion of virtual learning environments, particularly after the COVID-19 pandemic, has allowed more teachers in remote or underserved areas to access quality training. Countries like South Africa and India have adopted hybrid CPD models that incorporate technology, ensuring that teachers in rural areas can access high-quality training materials (Moon & Wolfenden, 2013).

Teacher observation and feedback are widely recognised as essential to successful CPD programmes. In systems like those in Japan and Shanghai, **teacher observation is integrated into the CPD process through lesson studies and classroom-based assessments**, allowing teachers to observe, critique, and improve each other's instructional practices (Akiba & Wilkinson, 2016). Such models highlight the value of peer-to-peer learning and ensure that teachers receive continuous, contextual feedback rather than isolated evaluations.

Mentorship plays a vital role in CPD, particularly in supporting novice teachers. Mentorship allows experienced educators to guide new teachers through pedagogy, classroom management, and curriculum alignment, bridging the gap between theory and practice (Hudson, 2013). In the UK, for instance, the Early Career Framework (ECF) has introduced structured mentorship as an integral part

of teacher development in the first two years of their careers, significantly improving retention and teacher efficacy (Sims & Fletcher-Wood, 2020).

Moreover, CPD programmes across various countries often include specialised training in educational technology and inclusion. For instance, the EU-funded KeyCoNet project emphasised the importance of equipping teachers with digital competencies to integrate ICT into teaching and learning. Similarly, equity and inclusion are considered focal points in CPD, as seen in frameworks in Canada, where teachers are prepared to address diverse classroom environments, particularly concerning students with special needs and those from marginalised backgrounds (Levin & Fullan, 2008). In conclusion, international practices indicate that successful CPD models for elementary school teachers are characterised by ongoing, collaborative, and contextually relevant training that aligns with national curriculum frameworks. Effective CPD designs include mechanisms for peer feedback, mentorship, digital integration, and professional learning communities that provide both support and accountability.

Section 3 – Continuous Professional Development Elementary Model

The CPD model for ESTs is designed to align with both global and local best practices, ensuring it meets international standards while addressing the specific needs of the educational context in KP. Developed through consultations with the DPD, DCTE and E&SED, this model aims to build sustainable professional growth pathways for teachers. It focuses on enhancing teacher competencies, improving instructional practices, and ultimately, boosting student learning outcomes.

The CPD model, as shown in **Figure 3.1**, comprises four key activities designed to support comprehensive, ongoing teacher professional development.



Figure 3.1: CPD-ESTs Key Activities

I. Personal Learning Hour

The "Personal Learning Hour" component is designed as a flexible, self-directed study platform. Each teacher is required to engage with the instructional materials, including lesson plans and videos, aligned with the academic calendar's Student Learning Outcomes (SLOs). These resources are updated monthly. The videos are either carefully curated or developed by the DPD, covering both SLO-based topics and effective teaching strategies. Upon completion of each cognitive unit, teachers are

required to take a self-assessment quiz, and a minimum score of 80% is necessary to proceed to the next unit.

II. Teacher Learning Forum

The CPD framework emphasises active learning, with all teachers required to join the Teacher Learning Forums. Each forum consists of 12-15 teachers who participate in both real-time (synchronous) and flexible (asynchronous) activities, facilitated by the DPD Subject Experts.

Teachers engage in two types of forums:

- Asynchronous Learning Forum
- Synchronous Learning Forum

Asynchronous Learning Forum

Asynchronous Learning forum provide a platform to teachers to discuss their learning with their peers during personal learning hours. Qualified Subject Experts selected by the DPD from the RPDCs as well as a pool of high schools or higher secondary schools in the same district oversee these forums for the core subjects: English, Mathematics, and Science. **The subject experts encourage active participation of the teachers through structured prompts and discussion topics.** Monthly surveys are conducted through these forums, designed centrally by DPD. These surveys provide insights that help shape future training sessions. To ensure meaningful participation, subject experts are trained in managing discussions, and feedback mechanisms.

Synchronous Learning Forum

Subject experts also lead monthly live sessions lasting 1.5 – 2 hours for each group of teachers. These sessions allow subject experts to deliver tailored content addressing teachers' specific needs, while also providing teachers with a platform to discuss issues, offer insights, or ask questions. These sessions are informed by three key sources:

1. Data from teacher's use of learning platforms during personal learning hours.
2. Results of teacher surveys conducted through asynchronous forums, and
3. Classroom observation data collected by headteachers, which is analysed for each group and shared with the subject experts.

Subject experts are fully trained in effective online moderation techniques. Each teacher participates in at least one forum per month, and if they teach multiple subjects, they join a forum for each subject.

III. Classroom Observation

The head of each middle school is responsible for observing every teacher once a month using the classroom observation tool specifically designed for ESTs. **The data from these observations is analysed to identify teachers' training needs and provide ongoing feedback on their instructional practices.** School heads are trained to conduct these observations and offer constructive feedback to teachers.

Additionally, RPDC officials and subject experts conduct joint observations with headteachers, using the same observation tool. Both the school head and the RPDC official or subject expert compare their evaluations, and the latter provides feedback on the school head's observation.

IV. Professional Learning Communities

Professional communities are established for different subjects, such as:

- Teacher Community for English
- Teacher Community for Mathematics
- Teacher Community for Urdu

These communities are nurtured through the asynchronous forums. Annual conferences and quarterly meetings at the tehsil, district, and provincial levels are organised to strengthen these communities and cultivate a professional development culture. Activities in these communities include action research, sharing teaching materials, bridging the gap between theory and practice, and organising events like workshops and seminars. DPD will work towards establishing connections between these forums and other national or international associations to further enhance the professional growth of teachers.

Section 4 - Technical Design & Methodology

The CPD-ESTs model was piloted with elementary school teachers across six districts of KP. This section outlines the overall methodology for the evaluation of the pilot. The evaluation uses a mixed-methods approach including the continuous tracking of teacher progress on digital modules, module completion rates, improvement in teachers' instructional practices as observed through classroom observations and qualitative feedback collected.

Below, we give detail on various ways through which effectiveness of the pilot is being determined:

I. Classroom Observations

Classroom observations are used to determine changes in teaching practices and instructional strategies before and after the intervention.

Before the start of the pilot, pre-classroom observations were conducted through specially designed tool for conducting classroom observations at the elementary level. For standardisation and comparability, all observations were conducted at grade 6 level, with equal proportion for all three subjects (English, Mathematics, and Science). The tool consisted of two major sections in addition to school level basic information. The teaching practices were assessed against 11 indicators under 'general practices' section, followed by subject specific section for English, Math, and Science.

The tools used for conducting classroom observations includes the following:

- **Basic Information** section includes school name, EMIS code, name of teacher, CNIC of teacher, name and designation of observer, and date of observation.
- **Information on observed class/lesson** includes class (class 6 was observed for all observations), number of students, subject observed, topic being covered at the time of observation, main Student Learning Outcome (SLO) covered at the time of observation, and observation's start and end time.
- **General practices**, for all teachers, regardless of subject, include articulating objectives, providing clear content explanations, making real-life connections, modelling concepts, understanding assessments, and monitoring student progress. They also involve making teaching adjustments, offering clarifying feedback, posing thinking questions, designing thinking tasks, and responding to students' needs effectively.
- **Subject-specific indicators** for English focus on how effectively teachers build on previously acquired language skills using innovative strategies to enrich learning and enable students to

critically and creatively engage with various text types. For Mathematics, the emphasis lies on creating meaningful linkages between prior and new concepts through diverse strategies like inquiry-based learning and discovery approaches. Teachers are expected to help students comprehend problems, explore multiple solutions, provide ample opportunities for practice in key content strands (e.g., number operations, geometry, algebra), and conclude problems using visual representations and formative assessments. In Science, teachers are expected to explain core concepts across life, physical, environmental, and earth sciences using appropriate terminologies, engage students in scientific methods of inquiry, and emphasise safety in experimental design. Additionally, they should foster a comprehensive understanding of the interconnections between science, technology, and society, highlighting their implications in real-world contexts.

A summary of the tools used for conducting classroom observations is provided in Table 4.1.

The tools capture data through a rating scale, where the observers rated the teachers against five distinct categories: 'Low', 'Medium Low', 'Medium', 'Medium High', and 'High'. Each category corresponds to a numerical value ranging from 1 to 5, where 1 represents the lowest level of performance and 5 represents the highest.

Table 4.1 – COT Indicators

Basic Information	About Observed class / lesson	General Practices	English	Mathematics	Science
School Name	Grade	1. Objectives articulation	1. Innovative English strategies	1. Math connections	1. Science concepts explanation
School EMIS	Number of students	2. Clear content explanation	2. Critical and creative responses	2. Problem-solving facilitation	2. Scientific method engagement
Teacher Name	Subject observed	3. Real-life connections		3. Practice and problem-solving opportunities	3. Demonstration of procedures incorporating safety
Teacher CNIC	Topic	4. Teacher modelling		4. Mathematical concept representation	4. Science-technology-society connections
Observer Name and Designation	Main SLO	5. Understanding assessment			

Observation Date	Observation Start & End time	6. Monitoring student progress 7. Teaching adjustments 8. Clarifying feedback 9. Thinking questions 10. Thinking tasks 11. Responding to needs			
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Data Validity & Reliability

Data validity and reliability measures were taken throughout the activity including development of tools, training of experienced field enumerators, and having two observations per teacher. The tools contained detailed instructions/descriptions of indicators to provide guidelines for observers to accurately capture information in class. The detailed instructions, coupled with training ensured homogenised understanding to the possible extent. Additionally, to minimise observer's variance and bias, each teacher was observed by two observers at the same time. Both observers recorded their observations independently during the class session. In all cases when multiple observers were involved in evaluating a teacher, the data collected were averaged to produce a final score. This method helped mitigate individual observer bias and provided a more balanced assessment of the teaching practices.

Sample Selection

To ensure data collection from a representative set of schools, the sampling approach followed a proportionate random sampling technique. A total of 59 schools, across six districts were selected. The districts included Battagram, Charsadda, Kohat, Malakand, Nowshera, and Orakzai. The sampling ensured maintaining district level and subject level proportions to achieve representativeness.

Coverage

A total of 59 schools were covered to observe 164 teachers providing 354 observations in total.

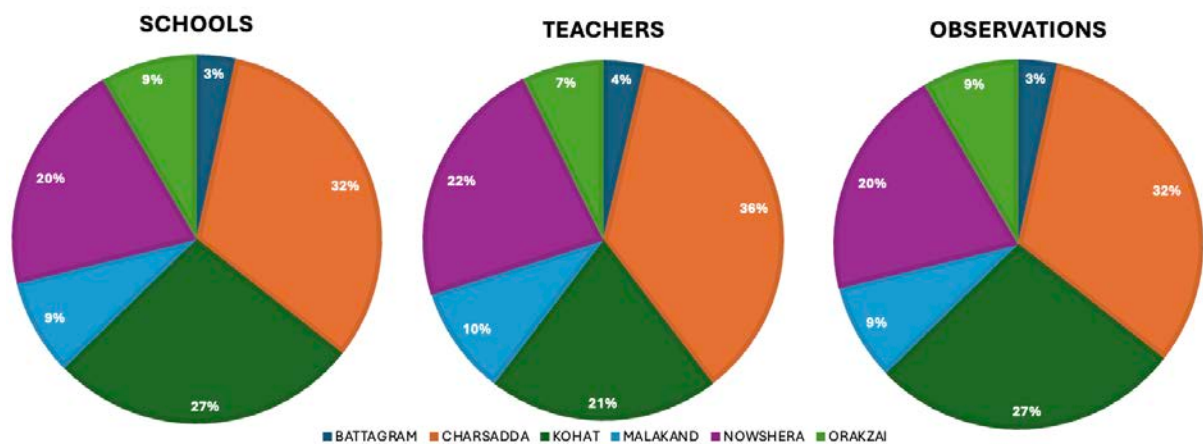


Figure 4.1: District wise distribution of sample

Subject wise distribution ensured equal split for English, Mathematics, and Science, with 118 observations for each subject.

Since, district level selection was proportionate, the number of observations vary at the district level accordingly.

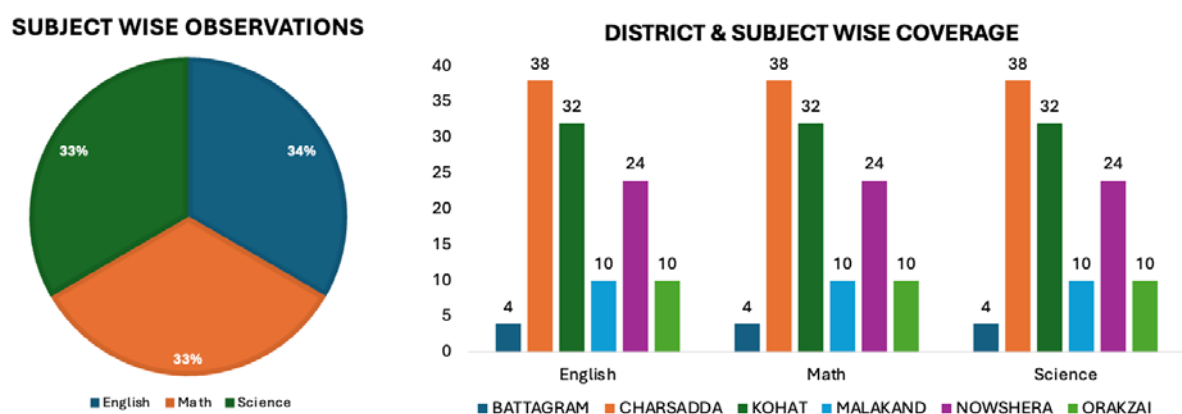


Figure 4.2: Subject wise coverage

Analysis

The pre-observations data was analysed to see trends and patterns in teaching practices in three subjects.

A similar set of post observations will be conducted at the end of the intervention and results will be analysed and reported.

II. Teacher Performance on Digital Modules

While teachers continue self-learning through digital modules, and attempt end of module assessment, their performance is analysed to see increase in subject content knowledge.

III. Teacher Perception Survey

A perception survey will be conducted with Grade 6 teachers after the intervention. This survey aims to gather insights into teachers' experiences and perceptions regarding the pilot's effectiveness. The data collected from the survey will be analysed to identify key trends and patterns in teachers' perceptions, which will serve as valuable feedback for refining the model for future implementations.

In addition to gathering insights into teachers' experiences with the pilot's effectiveness, the survey will also assess process-level indicators crucial for gauging the effective implementation of the pilot. These indicators include:

1. Accessibility of the online content
2. Usability of the content
3. Frequency of sessions conducted by subject experts
4. Quality/usefulness of sessions conducted by subject experts
5. Effectiveness of feedback provided by headteachers

The survey will use a combination of Likert scale questions and open-ended responses to capture both quantitative and qualitative data on these process-level indicators.

IV. Qualitative data

In addition to the survey, qualitative data will be gathered through interviews and focus group discussions with selected teachers. This approach will allow for a deeper exploration of teachers' experiences, highlighting specific challenges and successes regarding blended learning, offering a more nuanced understanding of how the intervention impacted teaching practices.

To provide a more comprehensive understanding of the implementation process, the qualitative data collection will be expanded to include the following:

1. Interviews with subject experts to assess their experience in designing and delivering sessions and conducting classroom observations
2. Interviews with headteachers to gather insights on the classroom observation process and its impact on teaching practices

Section 5 – Pilot Implementation

The implementation of the CPD-EST Pilot involved a multi-faceted approach to ensure comprehensive teacher development across the six targeted districts.

Following steps were followed to ensure implementation of the pilot.



Figure 5.1 – Steps for implementing the Pilot CPD Framework

Identification of Target Population

The target population for the CPD-EST Pilot was carefully selected to ensure a focused and impactful implementation. The pilot programme specifically targeted elementary school teachers from the six districts of KP. The total population included teachers from various subjects—English, Mathematics, and Science—who teach at the elementary level in 554 middle schools targeting 282 boys’ and 272 girls’ schools.

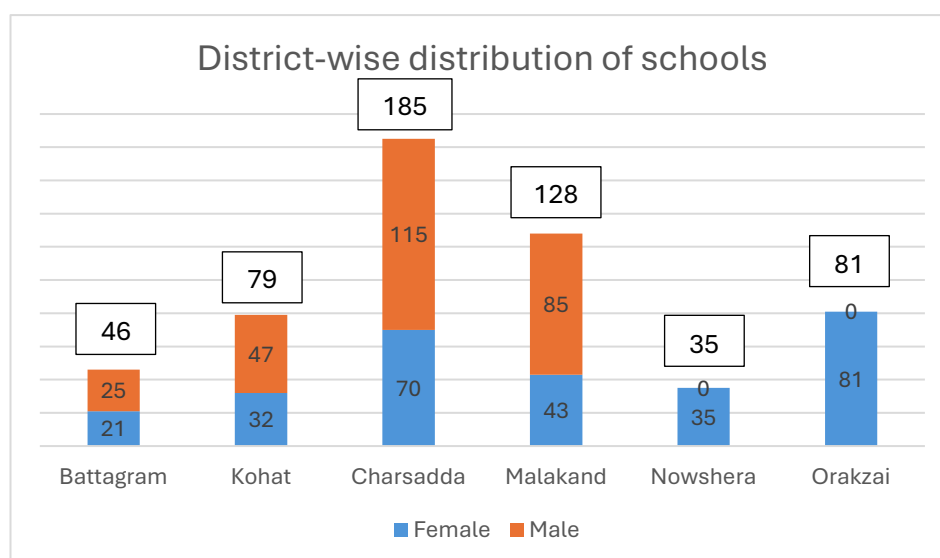


Figure 5.2 – District-wise distribution of pilot schools

Development of Teaching & Learning Materials

A crucial component of the CPD-EST Pilot was the development of subject-specific teaching and learning materials, tailored to address the unique needs of elementary school teachers in the targeted districts. These materials included:

1. Digital modules for Self-paced learning
2. Classroom Observation Tool for ESTs
3. Training Modules for HTs and SEs

1. Development of Digital Modules for Self-paced learning

Digital modules including teaching practices survey questionnaire, lesson plans aligned with the academic calendar, strategy videos and formative assessment items were developed.

The primary objectives of the digital modules are to:

- Provide standardised content to ensure consistent training quality across the board.
- Offer wide access, including for teachers in remote areas who may have limited opportunities for in-person training.
- Enable teachers to revisit and reuse the content over time, reducing the need for frequent, cost-ineffective in-person training sessions, especially considering the high costs of transport allowances.
- Provide self-paced learning opportunities to teachers where they could go through the content flexibly at their own pace and attempt end-of-module assessments to assess their understanding
- Help elementary teachers gain a deeper understanding of core concepts and classroom best practices in Math, Science, and English, effectively bridging the gap between theory and practice.

A modular approach was taken to develop the content through which monthly modules were developed in all three subjects and shared every month with teachers.

2. Classroom Observation Tool for ESTs

A classroom observation tool was designed to provide structured, subject-specific feedback in key areas: English, Mathematics, and Science. The tool was developed in alignment with best practices and adapted to the local context, enabling headteachers and subject experts to assess teacher

performance in relation to subject-specific competencies and overall instructional quality. The tool includes indicators tailored for each subject area, allowing evaluators to provide targeted feedback and support that enhances the teaching process.

3. Development of Training Modules

Following two distinct types of training modules for developed to support elementary teachers' CPD.

i. Training Modules for Subject Experts

Subject-specific training modules were developed for Subject Experts (SEs) in three subjects: Mathematics, Science and English, with the primary objective of equipping them to effectively address subject-specific pedagogical needs of teachers. These modules were designed to support SEs in the planning and facilitation of subject-specific online sessions, ensuring that they were both responsive and reflective of the real challenges faced in classrooms. The content of these sessions is informed by insights gathered from classroom observations, evaluations of teacher performance in the CPD modules, and discussions held in asynchronous learning forums, thereby providing a robust foundation for targeted professional growth. The modules encompassed a comprehensive range of strategies aimed at enhancing lesson planning, fostering active learning, and tackling subject-specific challenges commonly encountered by teachers.

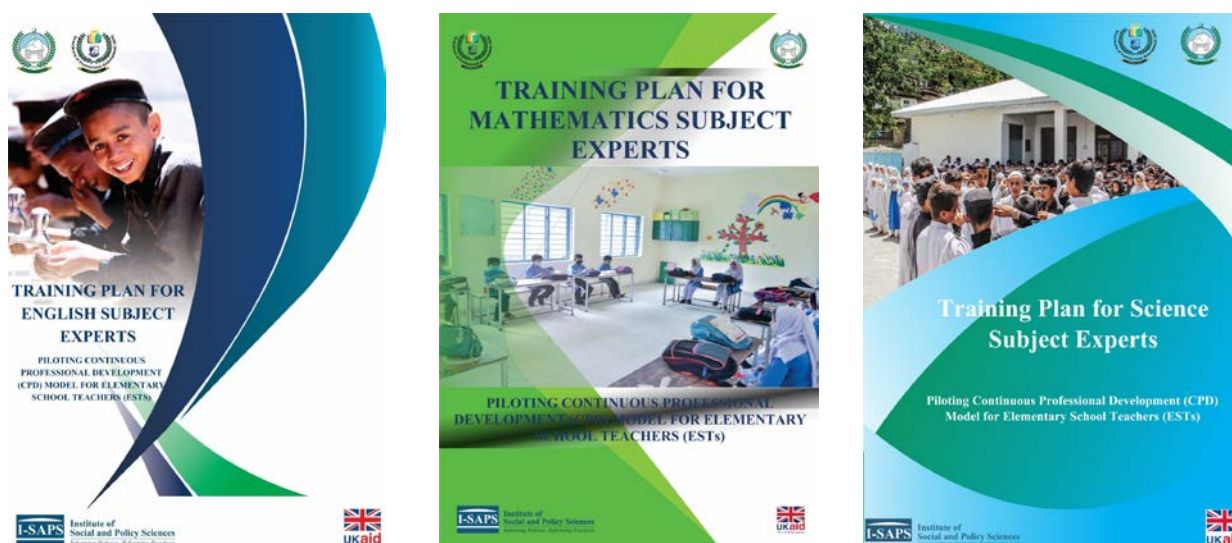


Figure 5.3: Training Modules – Cover Page

ii. Head Teachers and RPDC Officials Training

A specialised training module was developed specifically for Headteachers (HTs) and officials from the Regional Professional Development Centres (RPDCs), focusing on enhancing their capacity for effective classroom observation and the provision of constructive feedback. This module was tailored

to equip HTs and RPDC staff with essential mentoring and coaching skills, enabling them to provide meaningful support to teachers within their schools. The module covered a range of techniques for conducting structured classroom observations, with an emphasis on using systematic observation tools to assess teaching practices comprehensively and to identify areas for potential improvement. The module also included strategies to provide actionable and constructive feedback to teachers, thereby promoting a culture of reflective practice and continuous professional growth among teachers.

Content Review

A content review workshop was organised by the BTAG team with 11 participants (6 male, 5 female) from the DCTE and the DPD on **5th and 6th April** in Peshawar. The reviewers from diverse disciplines—including English, Mathematics, Science, and leadership—participated, providing detailed evaluations and recommendations for improving the CPD content and the training modules. The focus of the review was to ensure that the materials were not only aligned with the National Curriculum but also tailored to the specific educational context of KP. Reviewers assessed the relevance and accuracy of the material, the clarity of the instructions, and the applicability of various activities included in the modules. Specific recommendations included the inclusion of introductory sections to provide context, improvements to instructional clarity, and adjustments in the content to ensure that it was comprehensible and user-friendly. The mathematics' reviewers highlighted the need for a clear introduction to the programme in each module and user-friendly instructions regarding the utilisation of resources, which were subsequently added. The Science reviewers echoed similar concerns, with an emphasis on adapting the content to better suit KP's context, given its unique educational challenges. They also recommended reviewing digital resources, such as video links and technology-based activities, to ensure they were accessible and appropriate for the participants. For English modules, the review process involved aligning page numbers, simplifying language to enhance comprehension, and incorporating references to the Student Learning Outcomes (SLOs) within all lesson plans and assessments. For headteachers' training module, reviewers suggested incorporating more case studies, group discussions, role-playing, and practical activities to engage participants actively and foster a hands-on learning experience. Additionally, specific tools for classroom observations, such as the COT were reviewed, with modifications suggested to ensure they provided practical and targeted insights for teachers' ongoing professional development.

Content Uploading

1,517 teachers (812 male and 705 female) from 554 middle schools (272 male, 282 female) were given access to self-study modules through the Training Management System (TMS) of PITB in September. The TMS features the following components:

1. **Digital Modules:** Monthly modules, aligned with the academic calendar, covering SLOs for Mathematics, Science, and English using videos and lesson plans are uploaded on TMS for teachers to access. The platform allows teachers to select one subject at the start, providing access to content tailored to that subject.
2. **Survey Questionnaire:** A survey questionnaire developed for each subject, gathers information on the topics that teachers find challenging and the difficulties they encounter in classroom instruction on a monthly basis. This feedback is intended to inform the focus of upcoming learning forum sessions.
3. **End-of-Module Assessment:** Each module includes an assessment based on SLOs, designed to help teachers gauge their understanding. Teachers can re-attempt the assessment if they don't achieve satisfactory results initially, supporting their content knowledge growth.
4. **Discussion Forum:** A moderated discussion forum provides teachers with a platform to share challenges, successes, and progress. Subject Experts moderate the forums, posting questions, answering queries, and encouraging peer interaction to foster a supportive community.

1,498 teachers accessed the digital modules by December, completing the teacher survey, participating in discussion forums, and attempting the end-of-module assessments.

Training Delivery

Two types of training programme were delivered to support teachers' CPD. The details of these programmes are given below:

Training of Headteachers (HTs)

Training of headteachers was completed in two phases. In phase-I, selected Master Trainers (MTs) were trained who conducted training of HTs was done in phase-II through a cascade model.

(i) Training of Trainers (TOT)

The Training of Trainers (TOT) was conducted in Peshawar, from **October 31 to November 1**, where **19 MTs** received instruction aimed at delivering the CPD model effectively to ESTs. The participants included trainers from diverse backgrounds, with a mix of both male (7) and female (12) trainers, selected to ensure representation.

The TOT aimed to provide these trainers with a comprehensive understanding of the CPD model for ESTs, focusing on critical components such as effective mentoring, classroom observation, and feedback techniques using the COT. This comprehensive understanding was essential to enable the MTs to effectively train HTs.

(ii) Training of the Headteachers (HTs)

Following the **ToT**, the 19 trained MTs conducted a two-day training session for **526 HTs — 306 male and 220 female**. The training focused on four core areas including:

- **Programme Overview:** An introduction to the CPD-EST model, defining the role of HTs as instructional leaders and emphasising their role in improving classroom practices.
- **Teacher Motivation:** Detailed discussions on effective strategies to motivate and engage teachers in continuous improvement.
- **Subject-Specific Classroom Observation Tool:** Training on the use of subject-specific COT, essential for observing and assessing content-specific practices in Mathematics, Science, and English at the elementary level.
- **Mentoring, Coaching, and Feedback:** Sessions focusing on applying the COT for ESTs, mentoring techniques, coaching skills, and feedback strategies to promote reflective practices among teachers.

Training of the Subject Experts (SEs)

The Subject Experts (SEs) training programme, held from **October 28 to 30, 2024**, at **DPD Peshawar**, was designed to build the capacity of 73 SEs (36 males and 37 females) in English, Mathematics, and Science. Participants were selected based on their expertise and prior training experience. The training prepared SEs to support CPD initiative, facilitate teacher learning forums, and provide professional support through both synchronous and asynchronous platforms.

A brief overview of the SE training for each of the three subjects is as follows:

(i) Training of the English Subject Experts (SEs)

The English SEs training, attended by **22 participants**, focused on advancing pedagogical skills to improve language instruction in elementary schools.

Day One introduced the CPD model, emphasising learner-centred teaching and the use of Teacher Learning Forums to foster professional collaboration. A holistic approach to language learning, rooted in social constructivist pedagogy, was also highlighted.

Day Two covered strategies such as Gardner’s Multiple Intelligences theory to address diverse learning needs and effective listening techniques to improve communication skills. Activities included designing inclusive, engaging lessons aligned with practical classroom requirements.

Day Three focused on classroom observation using the Classroom Observation Tool (COT) to evaluate teaching practices and provide feedback. The day concluded with micro-teaching sessions, enabling SEs to apply their learning and receive peer feedback.



Figure 5.4: English SEs training in progress

(ii) Training of the Mathematics Subject Experts (SEs)

The 3-day training of Mathematics Subject Experts (SEs) was conducted for **24 Math Subject Experts**. The training programme aimed to enhance the pedagogical skills of SEs, equipping them to effectively lead learning forums and support CPD programme for ESTs. The training focused on building SEs' capabilities in implementing structured, engaging, and learner-centred approaches to mathematics instruction.

Day One focused on familiarising participants with the CPD model for ESTs, exploring their roles within Teacher Learning Forums, and highlighting the importance of active learning. The session

emphasised the role of Subject Experts in both synchronous and asynchronous learning settings, enabling them to facilitate effective professional development. Active learning techniques were introduced, promoting SEs to adopt and encourage these methods in their subsequent activities.

Day Two was dedicated to content-specific pedagogy, with a focus on teaching practices relevant to mathematics. Participants were introduced to the Concrete-Pictorial-Abstract (CPA) approach and the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model, both of which are crucial for designing effective lesson plans. Additionally, reflective practices and collaborative learning were key themes, enabling SEs to engage in professional dialogue and refine their teaching practices. The second day also featured in-depth discussions about barriers to learning mathematics and effective methods for overcoming these challenges.

Day Three focused on practical application through micro-teaching sessions, where SEs practised delivering mathematics lessons incorporating the newly acquired pedagogical skills. Participants received detailed feedback on their teaching practices, which were assessed against newly developed Classroom Observation Tool (COT) indicators. The 5E instructional model (Engage, Explore, Explain, Elaborate, and Evaluate) was used as a framework for designing inquiry-based lessons, ensuring a comprehensive understanding of effective lesson structure. The use of formative assessment strategies, such as questioning techniques and constructive feedback, was emphasised, equipping SEs to effectively support teachers in improving student outcomes.



Figure 5.5: Math SEs training in progress

(iii) Training of the Science Subject Experts (SEs)

The training programme for Science Subject Experts (SEs) was delivered to **24 Science Subject Experts**. It aimed to build the capacity of Science SEs to effectively support CPD for ESTs. The training programme focused on equipping SEs to facilitate active learning environments, engage teachers in inquiry-based practices, and contribute towards a learner-centred approach in science education.

Day One began with an introduction to the CPD model for elementary education, with a specific focus on the roles of Subject Experts. The SEs were introduced to the Classroom Observation Tool (COT), which serves as a key component for evaluating and supporting teachers' instructional practices. Participants gained insights into their responsibilities and the critical role they play in the professional development of science teachers.

Day Two focused on effective science teaching strategies and the implementation of inquiry-based learning. Participants were introduced to the 5E instructional model (Engage, Explore, Explain, Elaborate, Evaluate), which provides a structured approach for creating interactive and engaging lessons. The SEs also explored project-based learning (PBL) as a method to foster collaboration and critical thinking among students. Various activities helped SEs understand how to effectively choose strategies that align with specific learning objectives, and how to overcome common challenges faced in teaching science. Group work and collaborative exercises were used to further develop their skills in strategy selection and lesson planning.

Day Three was dedicated to practical applications, specifically focusing on micro-teaching sessions. SEs engaged in planning and delivering short lessons, followed by peer feedback to refine their teaching techniques. The micro-teaching sessions allowed participants to apply inquiry-based learning and PBL methods in simulated environments, receiving constructive feedback to improve their approaches. The day concluded with activities aimed at enhancing participants' ability to lead effective online training sessions, focusing on the use of digital tools such as Zoom & MS Teams to conduct synchronous learning forums for ESTs.



Figure 5.6: Science SEs training in progress

(iv) Pre- and Post- Training Scores

The effectiveness of the CPD-EST pilot training sessions was evaluated through pre- and post-assessment scores of subject experts across three subjects—English, Mathematics, and Science. The assessments aimed to measure improvements in subject experts' competencies and instructional practices because of their participation in the training. The average pre- and post-assessment scores in English, Mathematics, and Science demonstrate improvements as follows.

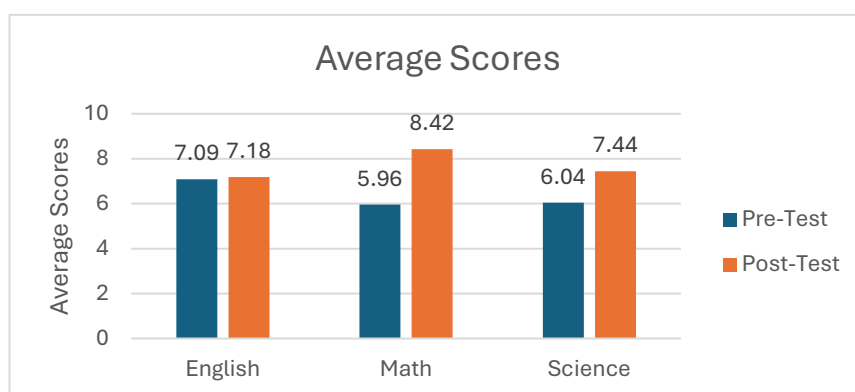


Figure 5.7 – Average Scores for Pre and Post Tests (Subject-wise)

In English, the average pre-assessment score was 7.09, while the post-assessment score increased to 7.18, indicating a limited improvement in teachers' content knowledge and teaching practices. In Mathematics, the average pre-assessment score was 6.96, which rose to 8.42 after the training, reflecting a considerable 21% increase. In Science, the average pre-assessment score was 6.04, which improved to 7.44 post-training, highlighting a 23% improvement. These improvements indicate that the training sessions were effective in enhancing subject experts' proficiency in both subject content and pedagogical strategies.

Section 6 - Assessing the effectiveness of the pilot

Pre-Observations by Independent Observers

The classroom observations conducted at the start of the intervention were a critical component of the CPD programme for the ESTs, focusing on assessing the existing teaching practices across a sample of 59 schools in the targeted districts. The observations encompassed the three core subjects: English, Mathematics, and Science, allowing for a comprehensive analysis of instructional methodologies prior to the intervention.

Identification and Selection of Independent Observers

The identification and selection of independent observers was done with careful consideration of specific qualification criteria, subject expertise, relevant teaching experience, and proficiency in data collection methods. This ensured that the observers possessed the necessary skills to accurately observe teaching practices.

Training of the Independent Observers on Subject-Specific Classroom Observation Tools

Following the selection process, the independent observers underwent an online targeted training on the COT including the subject-specific practices. This training aimed to equip them with a thorough understanding of the observation framework and the key indicators to be assessed during classroom visits. Each observation involved two independent observers to evaluate teaching practices. The primary purpose of these observations was to capture a baseline of teaching practices at the start of the intervention.

The pre-observation process commenced in October 2024. Post-observations will be done in March 2025 after the pilot. This timeline will allow for a systematic approach to data collection, with the findings providing valuable insights into the effectiveness of the intervention.

Pre-Observation Results

The **overall teaching score is 3.54 (out of 5)**, combining general practices and subject-specific indicators across all three subjects. Looking at each of the dimensions individually; the mean score of **general practices is found to be 3.64**, with subject-wise mean scores for relevant subject teachers as follows: **3.53 for English, 3.51 for Mathematics, and 3.31 for the subject Science.**

Table 5.2 provides a high-level summary of overall and district-wise findings for combined, general practices and subject-specific teaching practices.

As indicated in the table 6.1, the district-wise disaggregation shows variation to the overall averages. District Battagram has the overall mean score (combined) at 2.73, which is the lowest among all six districts, while district Kohat had the highest mean score with a value of 3.84.

Table 6.1: Summary of teaching scores by practices and districts

Category	Indicator / Practice	OVERALL	BATTAGRAM	CHARSADDA	KOHAT	MALAKAND	NOWSHERA	ORAKZAI
General Practices	1. Objectives articulation	3.68	3.17	4.02	3.78	3.43	3.44	3.13
	2. Clear content explanation	3.86	2.58	4.11	4.31	3.50	3.44	3.30
	3. Real-life connections	3.61	2.42	3.83	3.81	3.53	3.51	2.93
	4. Teacher modeling	3.64	2.42	3.90	4.03	3.33	3.21	3.20
	5. Understanding assessment	3.65	2.42	3.95	3.98	3.30	3.32	3.07
	6. Monitoring student progress	3.72	3.08	3.98	4.04	3.30	3.44	3.00
	7. Teaching adjustments	3.69	3.00	4.00	4.10	3.50	3.19	2.87
	8. Clarifying feedback	3.44	2.67	3.75	3.64	3.33	3.04	3.00
	9. Thinking questions	3.54	2.25	3.99	3.82	3.37	2.89	3.20
	10. Thinking tasks	3.61	2.42	3.96	3.94	3.43	3.06	3.27
	11. Responding to needs	3.56	2.00	3.85	3.99	3.43	3.28	2.53
	Mean Score - GP	3.64	2.58	3.94	3.95	3.41	3.26	3.05
English	1. Innovative English strategies	3.54	3.00	3.53	3.69	3.40	3.67	3.20
	2. Critical and creative responses	3.51	2.50	3.42	3.88	4.00	3.50	2.60
	Mean Score - Eng	3.53	2.75	3.47	3.78	3.70	3.58	2.90
Math	1. Math connections	3.42	3.50	3.58	3.63	3.00	3.58	2.20
	2. Problem-solving facilitation	3.63	3.00	3.32	3.69	4.40	3.92	3.40
	3. Practice and problem-solving opportunities	3.47	3.00	3.42	3.75	3.40	3.67	2.60
	4. Mathematical concept representation	3.53	4.50	3.32	4.00	2.80	3.42	3.40
	Mean Score – Math	3.51	3.50	3.41	3.77	3.40	3.65	2.90
Science	1. Science concepts explanation	3.37	2.50	3.21	3.69	3.80	3.50	2.60
	2. Scientific method engagement	3.47	3.00	3.32	3.94	3.20	3.50	3.00
	3. Demonstration of procedures incorporating safety	3.14	3.00	3.05	3.38	2.80	3.08	3.20
	4. Science-technology-society connections	3.25	1.00	3.32	3.63	3.40	3.17	2.80
	Mean Score - Sci	3.31	2.38	3.22	3.66	3.30	3.31	2.90
OVERALL MEAN *		3.54	2.73	3.66	3.84	3.41	3.37	2.98
* The overall mean is weighted average of the mean scores of each category/subgroup.								

The mean teaching score for teachers by district is represented in the chart in Figure 6.1.

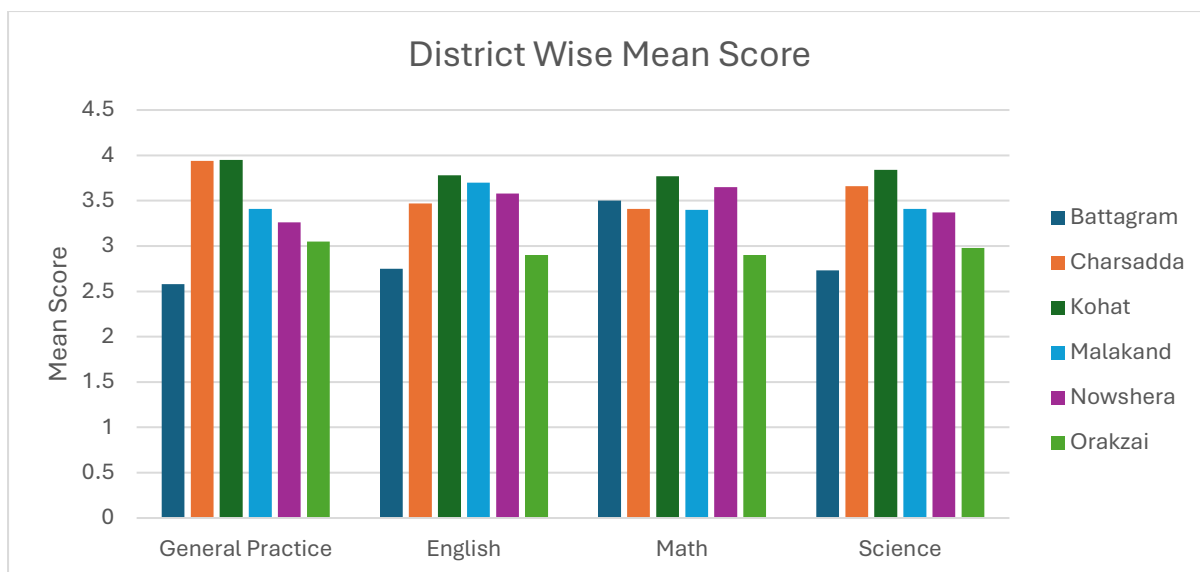


Figure 6.1 – District Wise Mean Score on Teaching Practices

Category Wise Teaching Scores

There were two major sections or categories including (i) general practices, and (ii) subject specific practices. The first section contained 11 indicators focusing on general teaching practices to capture essential aspects of classroom instruction.

The graph in Figure 6.2 presents the practices / indicator wise mean of teaching scores (out of 5).

Figure 6.2 – Category Wise Teaching Scores

The overall average for general practices is 3.64. There is significant variance at the individual practice level; overall, the teachers received highest rating on practice 2 i.e., explaining the content they are teaching, and while they scored lowest on practice 8, which relates to clarifying feedback.

The results for second section, that focused on subject-specific practices, is presented in Figure 6.3

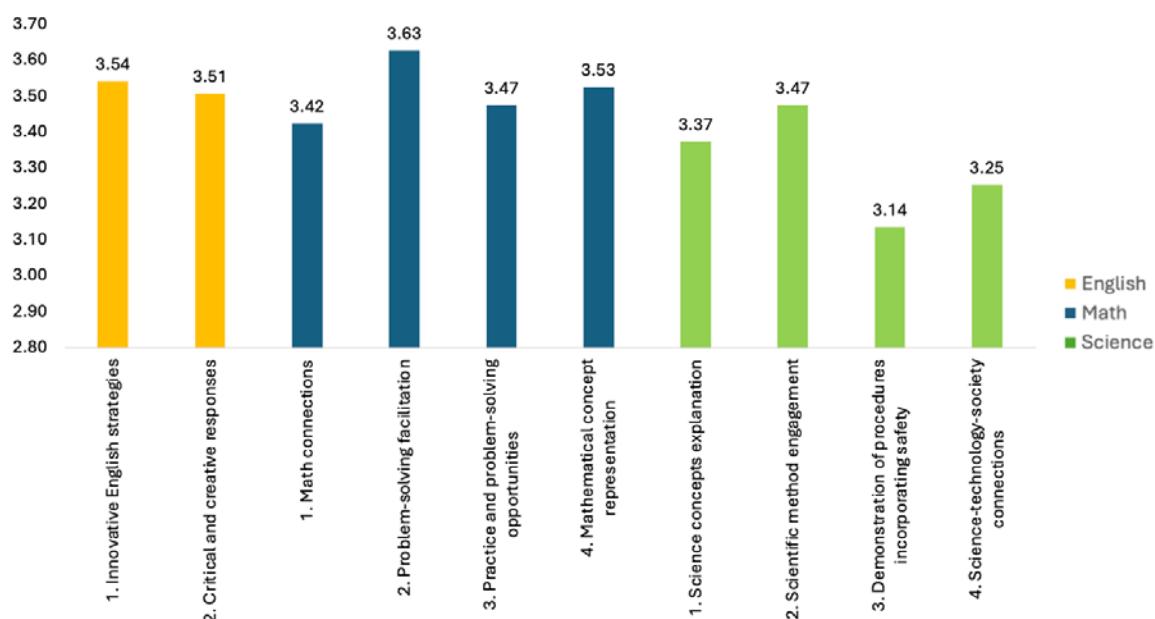


Figure 6.3 – Subject-specific Scores

Overall, for subject-specific sections, English teachers received the highest mean teaching score with a value of **3.53**, while Science teachers had the lowest mean value of **3.31**. The mean teaching score for Mathematics teachers was slightly below English, at **3.51**. Detailed subject-wise findings are summarised below:

English

The overall mean score for teachers on subject-specific indicators was **3.53**, with a **3.54** mean score for effectively building on previous knowledge through innovative strategies to enhance student learning, and **3.51** for enabling students to respond critically and creatively.

Mathematics

The overall mean score for Mathematics teachers on subject-specific indicators was **3.51**.

- The mean score for creating meaningful linkages between previously acquired concepts and new learning through strategies such as inquiry-based methods was **3.42**.
- Helping students make sense of mathematical problems by understanding their meaning and identifying multiple solutions received the highest score of **3.63**.
- Providing sufficient opportunities for practice and problem-solving in key concepts scored **3.47**.
- Concluding mathematical problems through visual representations, such as diagrams, graphs, and flowcharts, was rated at **3.53**.

Science

The overall mean score for science teachers was **3.31**.

- Explaining fundamental concepts, principles, and interconnections in various scientific domains using appropriate terminology received a score of **3.37**.
- Using strategies to engage students in scientific methods to develop solutions through observation, reasoning, and investigation scored **3.47**.
- Demonstrating principles and procedures for designing and implementing scientific investigations, including safety practices, was rated **3.14**.
- Promoting a deeper understanding of the connections between science, technology, and society scored **3.25**.

Distribution of Scores on Levels

The previous section looked at the mean scores on all practices by categories i.e., by general practices and subject specific indicators. This subsection discusses the distribution of scores segregated by different levels of scale i.e., ‘Low’, ‘Medium Low’, ‘Medium’, ‘Medium High’, and ‘High’. The graph in Figure 6.4, presents distribution of ratings across 5 levels for 11 general teaching practices.

Figure 6.4 – Distribution of Ratings

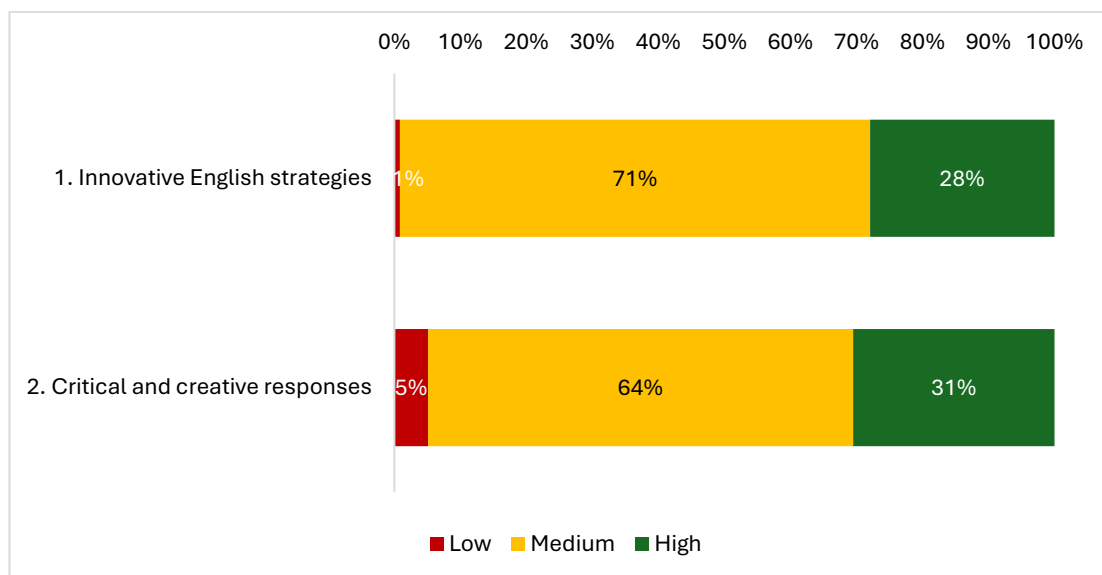
The distribution shows that majority of the teachers are rated at middle categories, with close to 50% teachers being rated at medium-high for almost all the practices.

For subject specific indicators, the scale was changed from 5 levels to 3 with options to rate practices as ‘Low’, ‘Medium’, or ‘High’. The level wise distribution for subject specific practices is discussed below.

English

It is observed that majority of the English subject teachers are rated at middle level for both subject specific indicators. Out of all observed teachers,

- 71% were rated at ‘medium’ level of skill for using innovative strategies to build on previously learned knowledge, and
- 64% were rated as ‘medium’ level for enabling students to respond critically and creatively.

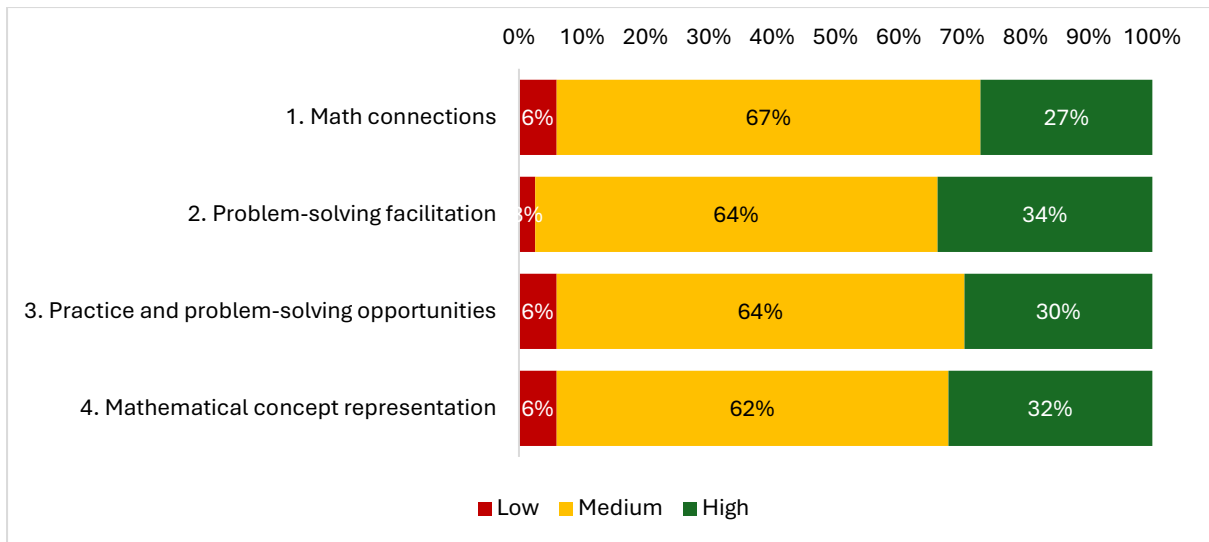


Math

It is observed that majority of the Math teachers are rated at middle level for both subject specific indicators. Out of all observed teachers,

Similar patterns are observed for teachers, with majority of observation values being as ‘medium’;

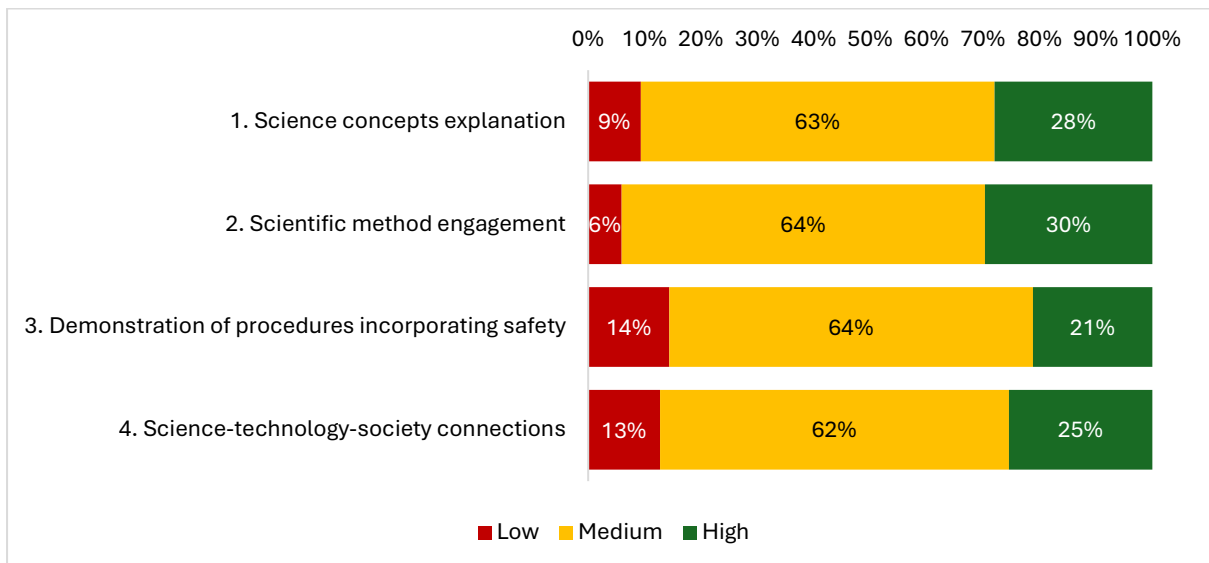
- 67% for building connections,
- 64% for facilitation of problem solving,
- 64% for providing problem solving opportunities, and
- 72% for representing mathematical concepts using graphs etc.



Science

Majority of observations with science teachers for subject specific indicators, as for other subject teachers, is rated at ‘medium’ level.

- 63% for explanation of concepts,
- 64% for engagement through scientific methods,
- 64% for demonstration of procedures with safety, and
- 62% for building connections between science, technology and society



Section 7 - Teachers' Professional Development Forum

The Teacher's Professional Development Forum was held on **26th October 2024** at the RPDC (Male) Thana, Malakand, with the support of BTAG. The forum, which saw the participation of **170 attendees**, was aimed at advancing Communities of Practice (COP) for teacher development in the region. The event celebrated the achievements of teachers, headteachers, and subject experts who had contributed significantly to the ongoing CPD initiative. The agenda included keynote speeches, panel discussions, breakout sessions, and round table knowledge exchanges, all designed to foster collaboration, knowledge sharing, and professional growth.

Objectives

The forum had the following objectives:

- Showcase best practices and innovations in teaching Science, English and Mathematics at elementary level.
- Encourage dialogue and collaboration among teachers, headteachers, and subject experts.
- Promote the importance of ongoing professional development and development of Communities of Practice.

The primary objectives of the forum were to showcase best practices in the teaching of Science, English, and Mathematics, and to encourage dialogue and collaboration among educators. By bringing together teachers, headteachers, and subject experts, the forum aimed to promote ongoing professional development and strengthen the COP that support continuous learning. The event also served as a platform to recognise the contributions of educators to the CPD programme and celebrate their role in improving educational quality in KP.

Event Highlights

The forum commenced with **Opening Remarks** delivered by Munir Ali Shah, Senior Instructor at DPD Peshawar. He emphasised the importance of professional development in building the capacity of teachers to enhance classroom instruction and contribute to improved student outcomes.

The **Keynote Speech** was delivered by the Secretary of Elementary & Secondary Education Department (E&SED), who underlined the critical role of effective teacher development in achieving educational excellence. The Secretary highlighted the provincial government's ongoing efforts to support educators through structured CPD programmes and reiterated the significance of COPs in facilitating teacher growth.

A **Plenary Talk** followed, involving the Special Secretary E&SED and Directors from DPD, DCTE, D&ESE, and Principal RPDC. This session provided a comprehensive overview of the existing CPD

initiatives and outlined the province's strategic vision for supporting professional learning among teachers.

The **Panel Discussion** focused on the role of Communities of Practice (COP) in teacher development, using a case study from KP. Panellists included teachers, principals, subject experts, and officials from RPDC, DPD, D&ESE, DCTE, and DEOs. The discussion centred on the value of COPs in fostering peer learning, enabling educators to share experiences, and promoting innovation in instructional practices. The panel highlighted the collaborative potential of COPs in breaking down traditional hierarchical structures and facilitating open communication and resource sharing among educators.

Breakout Sessions

The breakout sessions were conducted in three subject-specific groups—English, Mathematics, and Science. Each session was led by an expert and focused on effective teaching strategies to enhance learning outcomes:

- **English:** The session was led by Ms. Mussarat Shahid, the session on English teaching strategies emphasised holistic language instruction, integrating reading, writing, and speaking to create an interactive classroom environment. Practical techniques such as story-based learning and scaffolding were demonstrated to help teachers make language learning more engaging.
- **Mathematics:** Ms. Muneeza Junaid facilitated the session on mathematics, focusing on methods such as the Concrete-Pictorial-Abstract (CPA) approach to help students understand abstract mathematical concepts through concrete experiences. Participants were also introduced to inquiry-based learning strategies that encourage critical thinking and problem-solving.
- **Science:** The Science session, led by Ms. Memoona Safar, highlighted strategies for making science lessons more interactive and hands-on. The focus was on using the 5E instructional model (Engage, Explore, Explain, Elaborate, Evaluate) to promote inquiry-based learning and help students develop a deeper understanding of scientific concepts.

Round-Table Knowledge Exchange

In the afternoon, a **Round Table Knowledge Exchange** session provided participants with an opportunity to share experiences related to the implementation of subject-specific teaching strategies. Teachers, headteachers, and subject experts presented their experiences, focusing on the practical application of CPD strategies in classroom settings.

- **English:** Participants discussed the application of reading and comprehension strategies, sharing lessons learned from classroom practice. The discussions highlighted the

importance of adapting teaching approaches to accommodate different learning styles and ensuring that students were actively engaged in the learning process.

- **Mathematics:** Mathematics teachers shared their experiences with implementing the CPA approach and project-based learning. They discussed challenges in applying these methods in large classrooms and identified strategies for overcoming these obstacles, such as using collaborative group work to manage student engagement more effectively.
- **Science:** Science educators focused on the application of inquiry-based learning methods, sharing how they had used experiments and projects to spark student interest and curiosity in scientific concepts. Teachers emphasised the benefits of hands-on activities in helping students understand abstract concepts and develop problem-solving skills.

Conclusion

The Teacher's Professional Development Forum was successful in fostering a culture of collaboration, reflection, and continuous learning among educators in KP. By showcasing best practices, facilitating dialogue, and strengthening Communities of Practice, the forum contributed to the professional growth of teachers, headteachers, and subject experts. The event's emphasis on practical strategies for Science, Mathematics, and English teaching provided participants with valuable insights into improving their instructional methods and supporting student learning. The forum highlighted the importance of sustained professional development and collective effort in advancing the quality of education across the province.



Figure 7.1 – Teacher forum meeting in Malakand

Section 8 - Next Steps

As the CPD-ESTs pilot continues, a series of activities are planned through March 2025 to sustain momentum, deepen teacher engagement, and support ongoing programme evaluation. These activities, detailed below, will contribute to achieving the pilot's objectives, ensuring that the CPD framework is effectively meeting the needs of teachers and ultimately enhancing student learning outcomes.

1. ESTs in Science, Mathematics and English from elementary schools which are a part of this intervention, will proceed with self-learning modules, accessing digital resources and completing the end-of-module assessments. These assessments will be analysed to measure improvements in teachers' subject content knowledge, helping to identify areas for further support.
2. Headteachers will conduct monthly classroom observations and provide structured feedback sessions, ensuring each teacher is observed at least once per month. This consistent observation and feedback process aims to reinforce effective teaching practices and encourage reflective improvement among teachers.
3. Subject Experts will continue conducting monthly learning forums for teachers, focusing on findings from classroom observation data, end-of-module assessment performance, and discussion forum feedback. Subject Experts will also conduct joint classroom observations alongside headteachers, providing mentorship on observation techniques and verifying the implementation of new methodologies in classrooms.
4. A series of teacher professional development forums will be organised, managed by the DPD in pilot districts. These forums will provide teachers with an opportunity to share experiences, discuss challenges, and develop professional networks that support continuous improvement.
5. BTAG will scale up the CPD pilot to an additional 500 elementary schools, reaching approximately 1,500 ESTs and benefitting approximately 32,000 students. This expansion will allow for a broader evaluation of the programme's impact, offering valuable data on its effectiveness and scalability.
6. The data collected from the pilot's assessments, classroom observations, and professional forums will be used to review and revise the CPD framework. Based on the findings,

recommendations will be developed to refine the approach and ensure its effectiveness for potential wider implementation.