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Pilot Report

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

Punjab

Bridging Technical Assistance for Governments (B-TAG)

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Executive Summary

The Continuous Professional Development (CPD) for Elementary School Teachers (ESTs) initiative, launched in collaboration with the Quaid-e-Azam Academy for Educational Development (QAED) and aligned with the policy directives of the Government of Punjab, aims to enhance the quality of teaching and improve student learning outcomes in elementary schools across Punjab. This report provides an overview of the pilot programme, including key activities, training methodologies, outcomes, and next steps.

Revised CPD framework for ESTs, developed in consultations with QAED and SED consists of four activities, i) Personal learning hour for self-study, ii) Classroom Observations and feedback sessions by headteachers and Subject Experts on subject-specific Classroom Observation practices, iii) Teacher Learning Forums moderated by Subject Experts, and iv) Development of Learning Communities

The revised CPD framework was piloted in 343 middle schools in Sheikhupura and Nankana Sahib districts, targeting 135 boys' and 208 girls' schools. 1,433 Elementary School Teachers (ESTs), including 772 females and 661 males were given access to CPD content through Training Management System (TMS) managed by QAED.

To provide teachers with on-the-job support and training 310 headteachers (133 male, 187 female) received training on classroom observation using the Classroom Observation Tool (COT) tailored for elementary school teachers, feedback, motivating teachers, mentoring and coaching in August. Additionally, 43 Subject Experts (28 male, 15 female) in English, Mathematics, and Science, selected by QAED's Quality Assurance Wing, were trained on planning and conducting online sessions that emphasise subject-based pedagogy, informed by classroom observation data, teachers' performance in CPD modules, and discussions in asynchronous learning forums. The training yielded considerable improvements in content knowledge of these subject experts: in English, the average pre-assessment score rose from 7.1 to 9.2; in Mathematics, from 6.3 to 9.2; and in science, from 5.1 to 7.5.

To ensure capturing of accurate information on teaching practices and subject specific content and techniques, the classroom observations were conducted by independent observers for English, Mathematics, and Science in 50 sampled schools in September, covering 151 teachers and yielding a total of 300 observations. The data revealed trends in teaching practices, with mean scores of 2.85 for science, 2.98 for Mathematics, and 3.32 for English on a 0-5 Likert Scale.

To formally introduce communities of practice in the province, the first teacher professional development forum was organised in Sharaqpur QAED on 19th October with participation from teachers, headteachers, subject experts, officials from district QAED and education authorities. The forum provided a collaborative platform for CPD participants in both provinces to showcase innovative teaching strategies, share best practices, and strengthen Communities of Practice (CoPs), fostering sustained professional growth through discussions, presentations, and sessions focused on subject-specific pedagogy to improve educational outcomes.

The CPD-EST activities will continue in pilot districts, with ongoing support through self-study modules, monthly online sessions by Subject Experts, and headteacher-led classroom observations. The pilot will conclude in March 2025. Upon conclusion of the pilot, effectiveness of the pilot will be demonstrated and a scale-up plan will be developed based on insights and lessons learned from the pilot.

Beneficiaries

320	headteachers including **187 females** and **133 male**s
43	subject experts including **15 females** and **28 males**
1,433	elementary teachers including **772 females** and **661 males**
7,520	children including **4,175 boys** and **3,345 girls**

Section I: Introduction

Extensive research highlights the critical role of teachers in student achievement. A landmark study by Beteille Evans (World Bank) demonstrated that replacing a low-performing teacher with a high-performing one can significantly improve student learning outcomes.[1] This finding underscores the powerful influence that teacher effectiveness exerts on student progress. Similarly, Barber and Morshed (2007) emphasise this notion by asserting that the overall quality of an education system is ultimately limited by the quality of its teachers.[2] Effective teachers are, indeed, the cornerstone of a successful educational system.

High-quality elementary education forms the foundation of a robust education system. Therefore, equipping elementary teachers with the necessary knowledge, skills, and ongoing support is crucial for student success. However, Punjab's existing teacher training system may not fully address the evolving needs of educators and students at the elementary level. A well-designed Continuous Professional Development (CPD) Model can address these challenges by providing a structured and ongoing process for professional growth. These teachers played a critical role in the academic progression of students, particularly during the transition from primary to middle school, where subject-specific learning becomes more rigorous.

The Government of Punjab (GoPb) also acknowledges that improving student learning outcomes are intrinsically linked to enhancing the quality of teachers, making teacher development a central priority for educational reform efforts. However, previous efforts have mostly focused on primary school teachers, leaving a significant gap in the professional development of elementary school teachers (ESTs), despite the critical role they play.

The need for CPD-ESTs in Punjab

Given that traditionally, most of the focus is at the primary levels, it is crucial to vertically integrate the CPD initiative and extend it to Elementary School Teachers (ESTs) due to several compelling reasons. The state of student learning outcomes in elementary schools has been consistently below expectations[3]. The Provincial Assessment of Student Learning (PASL) [4], shows about a 50% gap between student and teacher scores on tests designed on the same Student Learning Outcomes (SLOs), suggests that the overall quality of teaching is below required levels. The need for a CPD programme for elementary school teachers is also necessitated by the uneven quality of pre-service teacher education programmes and the variable quality of higher education, which results in a mediocre intake of teachers. Coupled this with lack of structured professional development leads to outdated teaching methodologies, and student learning outcomes remain subpar. To address this gap, Quaid-e-Azam Academy for Educational Development (QAED) with technical assistance from Punjab Education Sector Programme-II (PESP-II), developed a framework for CPD for Elementary School Teachers (ESTs) in 2021-22 and tested some of its modalities. Based on the results

[1] Evans, Beteille. 2018. Successful Teachers, Successful Students. The Word Bank
[2] Barber, Michael and Morshed, Mona. 2007. How the World's Best-Performing School Systems Come on Top.
[3] Please see, "Exam analysis reports, 2018 and 2019." Punjab Examination Commission.
[4] Provincial Assessment of Student Learning (2018), Punjab Examination Commission.

from the pilot, in consultations with QAED and School Education Department, the framework was revised and piloted by Bridging Technical Assistance for Governments (BTAG).

CPD-ESTs Framework

The CPD framework is designed to offer targeted professional development opportunities that address identified teacher knowledge and skills gaps. The ~~revised~~ framework was developed in line with global and local best practices.

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 including QAED and PEC, making it more sustainable.

ii. Teachers' professional development needs are established through the collection of reliable and relevant data (including classroom observation and student assessment) which is meaningfully translated into teacher professional development targets and the progress against these targets is monitored.

iii. The CPD model for ESTs will capitalise on the existing infrastructure for learning and development in the province. This includes Training Management System (TMS) being managed by QAED 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. It is crucial that the CPD model aligns with the curriculum requirements.

Based on these attributes, and in-line with the CPD best practices, CPD model for ESTs has been designed by BTAG.

CPD-ESTs Activities

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

i. **Personal learning hour:** Self-study through lesson plans and videos disseminated through the QAED application 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 developed.

The revised framework was piloted in two districts in Punjab, Sheikhupura and Nankana sb. The pilot reached 1433 elementary school teachers from 343 elementary schools. Although the current CPD-EST Pilot focuses on two districts—Sharaqpur and Nankana Sahib—it serves as a pivotal step toward broader implementation across Punjab, with the ultimate goal of raising teaching standards and improving student outcomes in elementary education throughout the region.

Structure of the Report

This report outlines the CPD-ESTs revised framework, rationale for its design, implementation challenges and way forward. Section I offers an introduction of the report setting the context for the proposed CPD model including the need for a model, revise framework including its activities. Section II gives literature review focusing on best practices and lessons learned from successful CPD models. Section III describes design and methodology for pilot evaluation. Section IV discusses implementation of the pilot in detail. Section V describes results and section VI details next steps in implementation and way forward.

Section II: Literature Review

A comprehensive literature review of Continuous Professional Development (CPD) for Elementary School Teachers (ESTs) draws on international research and best practices to highlight the necessity, design, and impact of these programmes. Globally, CPD has 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 ideal teacher training programme is 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. Teachers are encouraged 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 successful CPD. 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

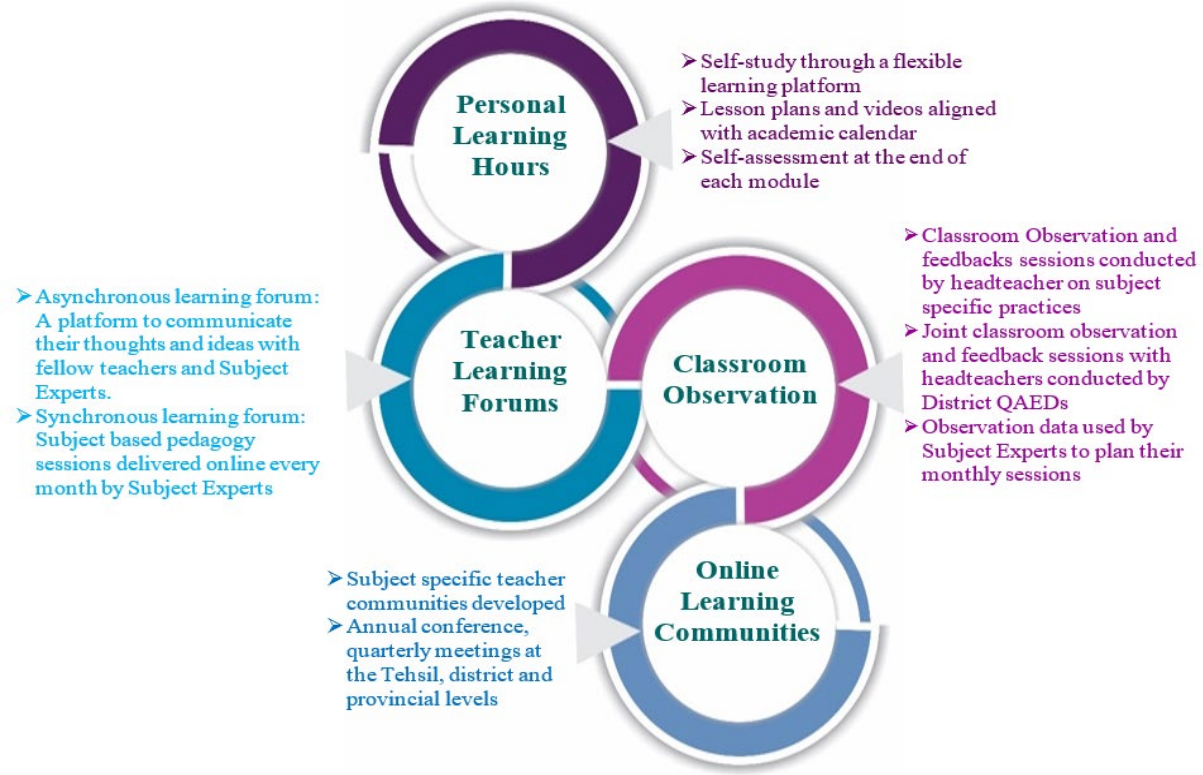
emphasised the importance of equipping teachers with digital competencies to integrate ICT into teaching and learning. Similarly, equity and inclusion are considered focal points in CPD, as seem in frameworks in Canada, where teachers are prepared to address diverse classroom environments, particularly 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. Such frameworks are essential for addressing the uneven quality of teaching and fostering sustained improvements in student learning outcomes, particularly in underserved educational settings.

Section III: Continuous Professional Development Elementary Model

The revised Continuous Professional Development (CPD) model for Elementary School Teachers (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 Punjab. Developed through consultations with the Quaid-e-Azam Academy for Educational Development (QAED) and the School Education Department (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 comprises four key activities designed to support comprehensive, ongoing professional development:



i. Personal Learning Hours

The "Personal Learning Hour" component is designed as a flexible, self-directed study platform. Each teacher will be required to engage with the instructional materials, including lesson plans and videos, aligned with the academic calendar's Student Learning Outcomes (SLOs). These resources will be updated monthly. The videos will be curated or newly developed by QAED, covering both SLO-based topics and effective teaching strategies. Upon completion of each cognitive unit, teachers will take a self-assessment quiz, and a minimum score of 80% will be necessary to proceed to the next unit.

ii. Teacher Learning Forum

The CPD framework emphasises hands-on learning, with all teachers required to join the online Teacher Learning Forums. Each forum will consist of 12-15 teachers who will participate in both real-time (synchronous) and flexible (asynchronous) activities, facilitated by QAED subject experts.

Teachers will engage in two types of forums:

- Asynchronous Learning Forum

During personal learning hours, teachers will need a space to discuss their learning with peers. To meet this need, QAED will select qualified subject experts from high schools or higher secondary schools in the same district, who will oversee these forums for the core subjects: English, Mathematics, and Science. The subject experts will encourage active participation of the teachers. Monthly surveys will be conducted through these forums, designed by provincial QAED. These surveys will provide insights that will help shape future training sessions. To ensure meaningful participation, subject experts will be trained in managing discussions, guided by comprehensive rubrics and feedback mechanisms supported by technology.

- Synchronous Learning Forum

Subject experts will 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 will be 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 will be analysed for each group and shared with the subject experts.

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

iii. Classroom Observations

The head of each middle school will be responsible for observing every teacher once a month using the classroom observation tool specifically designed for ESTs. The data from these observations will be analysed by subject experts to determine teachers' training needs and provide ongoing feedback on their instructional practices. School heads will undergo thorough training to conduct these observations and offer constructive feedback.

Additionally, district QAED officials and subject experts will conduct joint observations with headteachers, using the same observation tool. Both the school head and the district QAED

official or subject expert will compare their evaluations, and the latter will provide feedback on the school head's observation. This data will further inform the professional development of teachers.

iv. Professional Learning Communities

Professional communities will be established for different subjects, such as:

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

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

Section IV: Technical Design & Methodology

The CPD-ESTs model is being piloted in two districts in Punjab, Sheikhupura and Nankana Sahib. This section outlines the overall methodology for pilot's evaluation. The pilot aims to improve teachers' subject content knowledge and pedagogy skills evident through teaching practices, measured through classroom observation. This evaluation will use mixed-method approach continuously gather data on teachers' progress, module completion rates, and engagement. Additional data from end-of-module assessments and participation in learning forums will also be gathered to evaluate the effectiveness of the CPD content.

The pilot programmes' evaluation will guide the scaling-up plan of CPD for Elementary Teachers. The results from the pilot will be analysed to develop actionable recommendations for improving the CPD framework for ESTs. These insights will be critical for refining the frameworks to ensure their effectiveness prior to a broader implementation. By identifying strengths and areas for enhancement, this evaluation will guide the development of a scalable and effective CPD plan, aiming to elevate the quality of elementary education across both provinces.

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

i. Sample Selection

For data collection, the sampling approach followed purposive sampling, combining convenience sampling and quota-based sampling.

The schools were selected based on proximity to locations of subject specialists while maintaining district level and subject level proportions to achieve representativeness.

Using geo-coordinates of schools and subject experts' locations, distances were mapped using 'Google My Maps'. Schools were then selected based on proximity to subject experts while ensuring coverage of all three subjects in each selected school. The calculations of distances and selection of schools with subject expert assignment were done using STATA.

ii. Classroom Observations

To ensure capturing of accurate information on teaching practices and subject specific content and techniques, the classroom observations will be conducted for English, Mathematics, and Science before and after the intervention. For the conduct of the observations, experts with subject qualification, training and data collection experience were selected.

The observations were conducted using specially designed tool for assessing teaching practices at the elementary level. For standardisation, all observations were conducted at grade 6 level, with equal proportion for all three subjects (English, Mathematics, and Science).

The tools used for conducting classroom observations has three sections:

- Basic information on school, teachers, and number of students in grade 6

- 11 questions/indicators on pedagogical practices
- Subject specific questions/indicators

A summary of the tools used for conducting classroom observations is provided in the table 1.

Table 1: CPD Elementary Classroom Observation Tool

Basic Information	About Observed class / lesson	General Practices	English	Mathematics	Science
School Name School EMIS Teacher Name Teacher CNIC Observer Name and Designation Observation Date	Grade Number of students Subject observed Topic Main SLO Observation Start & End time	1. Objectives articulation 2. Clear content explanation 3. Real-life connections 4. Teacher modelling 5. Understanding assessment 6. Monitoring student progress 7. Teaching adjustments 8. Clarifying feedback 9. Thinking questions 10. Thinking tasks 11. Responding to needs	1. Innovative English strategies 2. Critical and creative responses	1. Math connections 2. Problem-solving facilitation 3. Practice and problem-solving opportunities 4. Mathematical concept representation	1. Science concepts explanation 2. Scientific method engagement 3. Demonstration of procedures incorporating safety 4. Science-technology-society connections

The tools are designed to capture data through a rating scale across 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.

iii. Data Validity & Reliability

Multiple checks will be employed to ensure data validity and reliability. In case of pre-observations, first, selection of subject specific observers to conduct classroom observations was done to ensure the observers are well equipped with requisite skills and knowledge to accurately gauge and rate teaching practices. Second, the tools contained detailed instructions/description of indicators to provide guideline for observers to accurately capture information in class. Third, to minimise observer's personal variance, each teacher was observed by two subject experts/observers at the same time. Both observers recorded their observations independently during the class session. This dual-observer approach helps ensure reliability and validity in the data collected. In all cases when multiple observers were involved in evaluating a teacher, the data collected were averaged to produce a final score. This method helps mitigate individual observer bias and provides a more balanced assessment of the teaching practices observed.

iv. Coverage

A total of 50 schools were covered to observe 151 teachers providing 300 observations in total.

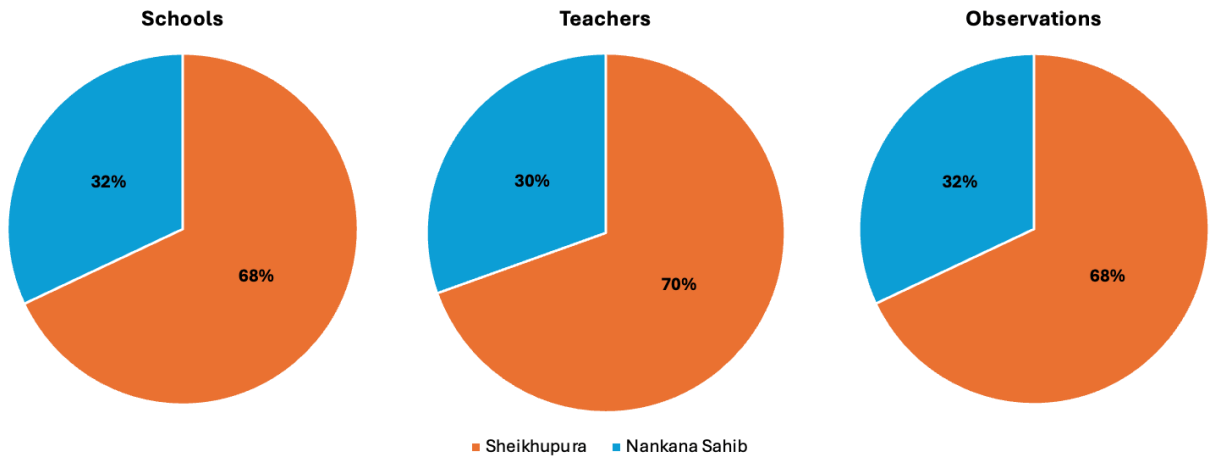


Figure 1: District wise distribution of sample

Subject wise distribution ensured equal split for English, Mathematics, and Science, with 100 observations per subject. District wise, 68 observations for each subject were from district Sheikhupura and 32 observations for each subject from district Nankana Sahib.

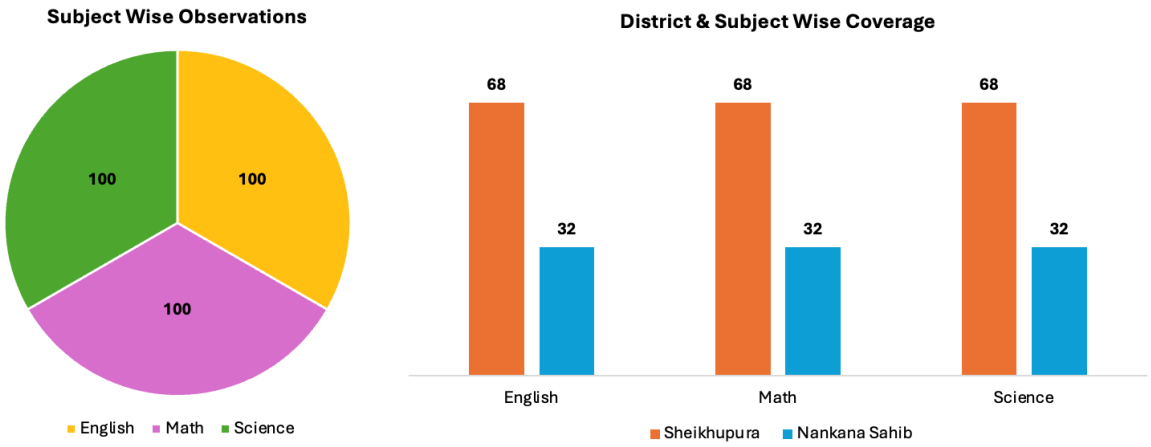


Figure 2: Subject wise coverage

v. Analysis

The data was analysed to see trends and patterns in teaching practices in three subjects and are reported in section V. A similar set of observations will be conducted at the end of the intervention and results will be reported.

vi. Teacher Performance on End-of-Module Assessment

Teachers will continue self-learning modules, attempt end of module assessment, which will be analysed to see increase in subject content knowledge.

vii. Teacher Surveys

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 CPD model and the curriculum for future implementations.

viii. 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.

Section V: Pilot Implementation

The implementation of the CPD-EST Pilot involved a multi-faceted approach to ensure comprehensive teacher development across the two targeted districts. Following steps were followed to ensure implementation of the pilot.

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 two districts: Sharaqpur and Nankana Sahib. The total population included teachers from various subjects—English, Mathematics, and Science—who teach at the elementary level in 343 schools (180 in Sheikhupura and 163 in Nankana sb). 343 middle schools across Sheikhupura and Nankana Sahab districts, targeting 135 boys' and 208 girls' schools.

Development of Teaching and 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:

i. Digital Modules for Self-paced learning

Digital modules including lesson plans, strategy videos and formative assessment items were developed in line with the academic calendar based on the SLOs. CPD Teaching strategy videos will 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. These videos are a key element of the Continuous Professional Development (CPD) model for Elementary School Teachers (ESTs), which follows a blended learning approach. The primary objectives of these videos 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.

A modular approach was taken to develop the content. These modules aimed to provide self-paced learning opportunities to teachers where they could go-through the content flexibly at their own pace and attempt end of module assessment to assess their understanding.

All three subjects had monthly modules developed and shared every month with teachers. Each module consists of teaching practices survey questionnaire, lesson plans aligned with academic calendar, strategy videos and end of module assessment questions.

ii. Classroom Observation Tool for ESTs

A classroom observation tool, designed to provide structured, subject-specific feedback in key areas: English, Mathematics, and Science. This tool was developed in alignment with best practices and adapted to the local context, enabling headteachers and subject experts to conduct comprehensive evaluations of teaching methods and classroom dynamics. COT, annexed as annexure-A, serves as a guide for assessing teacher performance in relation to subject-specific competencies and overall instructional quality. It includes indicators tailored for each subject area, allowing evaluators to provide targeted feedback and support that enhances the teaching process. The COT was designed to be adaptable across diverse classroom settings, ensuring that it can be applied effectively in all elementary schools within the two districts. By focusing on subject-specific teaching practices, the tool promotes reflective teaching and continuous improvement, enabling teachers to develop stronger pedagogical skills that can lead to better student learning outcomes.

iii. Training Modules

Two distinct types of training modules were developed to support the Continuous Professional Development (CPD) initiative, each tailored to meet the specific needs of different stakeholders involved in the program:

Subject Specific Training: Separate training modules were developed for each core subject—English, Mathematics, and Science—to equip Subject Experts to address subject-specific pedagogical needs. These modules aimed to support Subject Experts in planning and delivering online sessions focused on effective, subject-based teaching strategies, informed by classroom observation data, teachers' performance in previous CPD modules, and ongoing discussions in asynchronous learning forums. They include strategies for lesson planning, engaging students in active learning, and addressing common challenges in each subject. Interactive activities, such as case studies, role-playing, and group discussions, were incorporated to help Subject Experts create dynamic, learner-centred online sessions that meet diverse student needs.

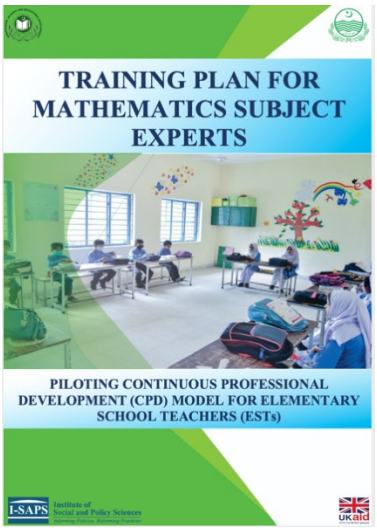


Figure 4: Cover page for Math Subject Expert Training Module

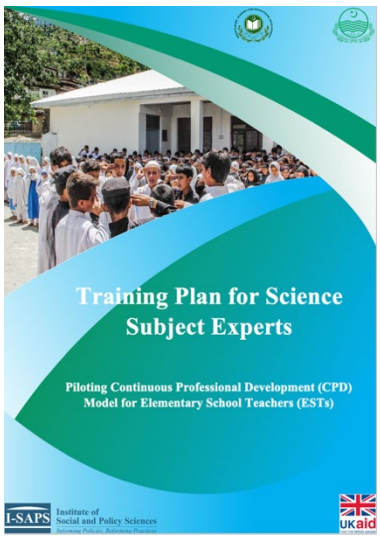


Figure 5: Cover page for Science Subject Expert Training Module

Figure 3: Cover page for English Subject Expert Training Module

HTs and District QAED training: This module was specifically designed for Headteachers and district QAED officials, focusing on classroom observation and feedback. The training module aimed to equip HTs and QAED staff with effective mentoring and coaching skills, enabling them to guide teachers in improving their classroom practices. Key topics covered in this module include techniques for conducting structured classroom observations, providing constructive feedback, and fostering a supportive environment for teachers' professional growth. Through this module, HTs and district QAED officials learned how to use observation tools to assess teaching practices, identify areas for improvement, and provide actionable feedback to promote continuous development.

Content Review

A comprehensive content review workshop was held at the Quaid-e-Azam Academy for Educational Development (QAED) to evaluate and enhance the CPD materials, including lesson plans, videos, assessment items, and training modules. Reviewers with expertise in English, Mathematics, Science, and leadership were engaged to assess the content rigorously and provide constructive feedback. This workshop aimed to ensure that the CPD resources align with educational standards and effectively support teachers' professional development.

Additionally, the Classroom Observation Tool (COT) for elementary teachers was reviewed in collaboration with key stakeholders, including representatives from the Punjab Examination Commission (PEC), the Program Monitoring and Implementation Unit (PMIU), the School Education Department (SED), and QAED. This collaborative approach allowed for diverse perspectives, ensuring that the COT was comprehensive and aligned with the specific needs of elementary education.

The BTAG team facilitated the review workshop, guiding discussions and incorporating feedback and suggestions from all participants to refine and improve the content. This collective effort has strengthened the quality and relevance of CPD materials, aiming to better equip teachers and enhance teaching practices across the province.

Content Access ~~Uploading~~

Teachers were given access to self-study modules available through the Training Management System (TMS) of QAED, which featured the following components:

1. **Digital Modules:** Monthly modules, aligned with the academic calendar, covering Student Learning Outcomes (SLOs) for Mathematics, Science, and English using videos and lesson plans were uploaded on TMS for teachers to access. The platform allowed teachers to select one subject at the start, providing access to content tailored to that subject.

2. **Survey Questionnaire:** A survey questionnaire was developed for each subject, gathering information on the topics teachers found challenging and the difficulties they encountered in classroom instruction. This feedback was intended to inform the focus of upcoming learning forum sessions.

3. **End-of-Module Assessment:** Each module included an assessment based on SLOs, designed to help teachers gauge their understanding. Teachers could re-attempt the assessment if they didn't achieve satisfactory results initially, supporting their content knowledge growth.

4. **Discussion Forum:** A moderated discussion forum provided teachers with a platform to share challenges, successes, and progress. Subject Experts moderated the forums, posting questions, answering queries, and encouraging peer interaction to foster a supportive community.

Teachers were directed to access the digital modules through a notification (Annexure-I) with the following steps:

Step 1: Download the QAED Application from the Play Store

Step 2: Log in using HRMIS SIS credentials.

Step 3: Select "CPD for Elementary School Teachers" and choose the relevant subject to access CPD content, including lesson plans and videos.

Step 4: Complete the teacher survey, participate in discussion forums, and attempt the assessments.

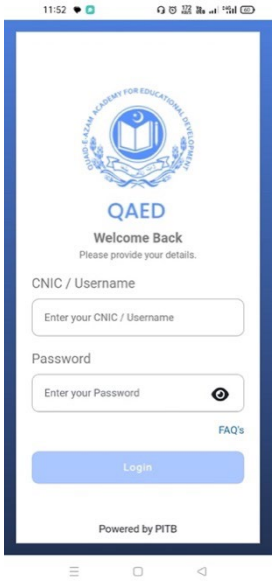


Figure 1: Download QAED application and Login using SIS login details

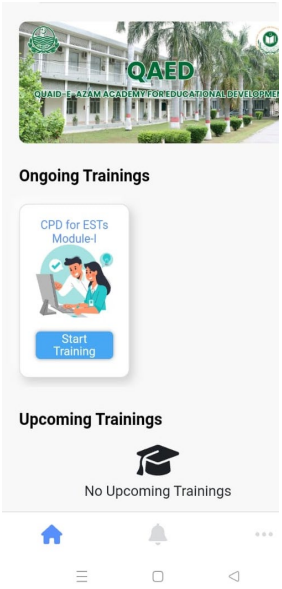


Figure 2: Select CPD for ESTs

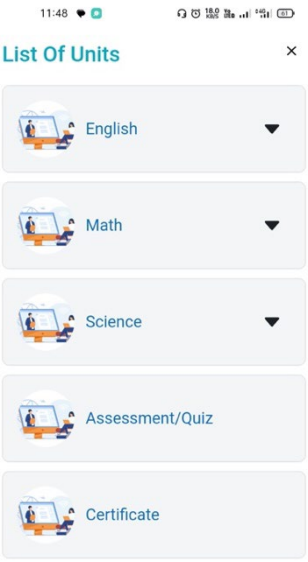


Figure 3: Select Subject

Figure 4: Go through lesson plans and videos

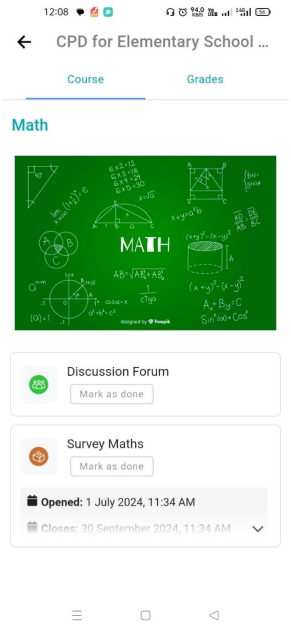


Figure 5: Participate in Discussion forum and survey

Training Delivery

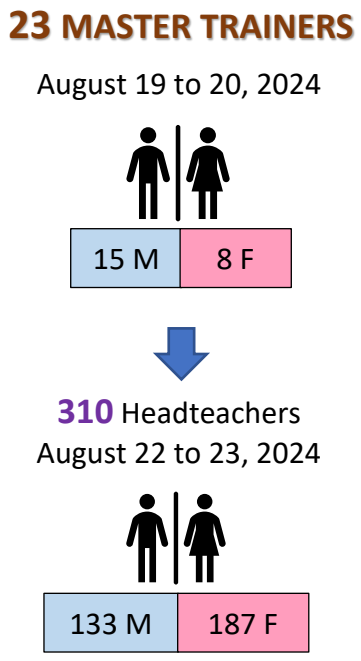
The training delivery for the CPD-EST Pilot involved two main types of training sessions aimed at ensuring effective programme implementation and sustainable professional development for Head Teachers (HTs) and Subject Experts (SEs). The training sessions included:

HTs Training

The Head Teachers' (HTs) training sessions were designed to equip 310 HTs with essential skills to mentor, observe, and motivate teachers, aligning with the CPD model's objectives. The training approach combined deductive and inductive methodologies with activity-based learning, ensuring interactive and hands-on experiences. Sessions included role-playing exercises where participants practiced scenarios such as motivating underperforming staff, using the COT in real-world contexts, and discussing its practical implications. Trainers encouraged high standards of discussion, allowing participants to share insights from their own school environments. The training covered the following sessions:

i. **Training of Trainers (TOT)**

The Training of Trainers (TOT) sessions, under the Continuous Professional Development (CPD) Model for Elementary School Teachers (ESTs), were conducted as part of the CPD-EST Pilot. These sessions took place in Sheikhupura on August 12, 2024, and in Nankana Sahib on August 13, 2024. A total of 25 Master Trainers (MTs) were trained to deliver the programme in a cascade model. This method involves the training of Master Trainers, who, in turn, train the teachers, ensuring the sustainable professional development of ESTs. 23 MTs were trained to train HTs including 11 (8 M, 3 F) in Sheikhupura and 12 (7 M 5 F) in Nankana sb on 19-20 August, 2024. Among the 23 MTs, there were 4 officials from district QAED.



The primary objective of these TOT sessions was to equip the Lead Trainers with a comprehensive understanding of the CPD Model for ESTs and its key components.

The sessions aimed to:

- Familiarise participants with the CPD model and its core principles;
- Explore strategies for motivating teachers, particularly those underperforming;
- Introduce the Classroom Observation Tool (COT) and its indicators, essential for mentoring and evaluating teachers;
- Enable the effective use of the COT to provide constructive feedback and mentorship to teachers.

The training sessions were led by an experienced trainer from the B-TAG training team facilitated by district QAED and were structured to provide an in-depth understanding of key aspects of the CPD model.

Fauzia Fazal Hashmi

Senior Subject Specialist (Education)
District QAED Sharaqpur

I recently participated in the Training of Trainers (TOT) sessions conducted by the esteemed trainer Mrs. Bushra Naqvi, focusing on the new Continuous Professional Development (CPD) Model for Elementary School Teachers (ESTs) as a Lead Trainer. The engaging discussions, the use of various thinking hats, and project-based micro-sessions equipped us with the knowledge, skills, and dispositions necessary to deliver effective training for Head Teachers (HTs) and ESTs. Mrs. Naqvi empowered us to adopt diverse perspectives to comprehend training scenarios and respond appropriately.

The new CPD model has broadened the scope of professional development experiences from Primary School Teachers (PSTs) to ESTs, with the aim of cultivating responsible, accountable, and pedagogically skilled educators. This approach will further enhance reflective teaching practices among teachers. By extending CPD from individual activities to collaborative learning forums and larger professional communities, we can significantly improve the quality of education. As a result, a robust network of educators will emerge, facilitating the exchange of ideas, current practices, discussion of teaching challenges, suggestions for solutions, and their application in real classroom settings.

By implementing this model, we can effectively address the teaching challenges faced in classrooms through the expertise of subject specialists. This, in turn, will enable elementary school teachers to create conducive learning environments that foster quality instruction. Ultimately, the primary beneficiaries of this programme will be the subject teachers, students, and our educational system as a whole. However, the success of this initiative will rely heavily on continuous follow-up and the consistent application of the entire CPD programme, ensuring that all participants remain engaged, responsible, and accountable.

ii. Headteachers Training

The Headteachers' training covered critical areas essential for instructional leadership and teacher support. Key focus areas included:

- **Programme Overview and Teacher Motivation**: An introduction to the CPD-EST model, defining the role of Head Teachers as instructional leaders and emphasizing the use of the COT for 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 COTs, essential for observing and assessing content-specific practices in Mathematics, Science, and English at the elementary level.

- **Mentoring, Coaching, and Feedback**: Sessions focused on applying the COT, mentoring techniques, coaching skills, and feedback strategies to promote reflective practices among teachers.

Through this training, Head Teachers gained skills to guide and support teachers in their roles under the CPD model, aligning with the Government of Punjab's goals of enhancing classroom quality and student outcomes.

Figure 7: TOT session in progress

Figure 6: HTs training in progress

SEs Training:

A three-day training of Subject Experts (SE) session was held in Sharaqpur. The participants were selected by the QAED based on their qualifications, training skills, and ability to effectively deliver training sessions and facilitate CPD-ESTs. The participants were selected by the Quality Assurance Wing of QAED on the basis of their subject knowledge in science, training experience and ability to effectively mentor, coach and provide on-the-job training to teachers. The group included high school teachers, some Elementary School Teachers, Assistant Education Officer (AEO) and district QAED officials.

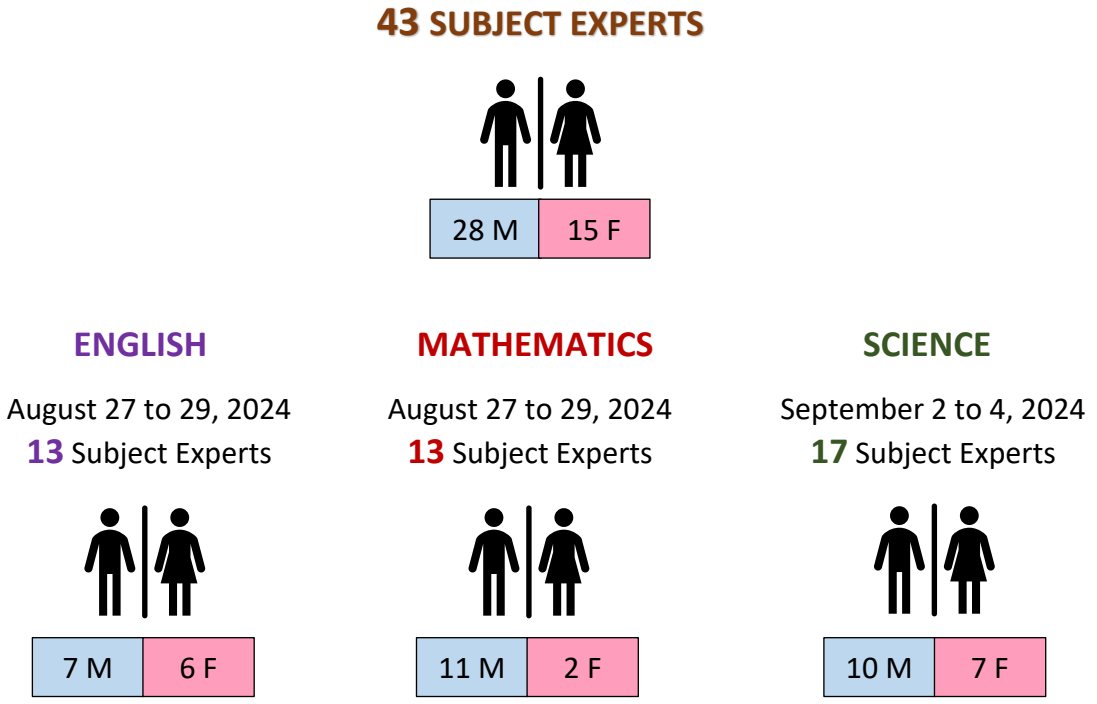


Figure 8: Gender-wise breakdown of Subject Experts

Following three sessions were delivered.

- **Training of the English Subject Expert**

The training was delivered to 13 Subject Experts on August 27 to 29, 2024. The objective of the training was to equip the SEs with innovative strategies for teaching English at the elementary level. The focus was on enhancing their professional competencies, particularly in holistic language instruction, addressing second language acquisition challenges, and applying context-specific, social constructivist approaches. The training also introduced the concept of multiple intelligences to improve teaching methods.

Throughout the three-day session, emphasis was placed on lesson planning using Gagne's Nine Events of Instruction and creating rubrics for skills assessment. The training followed a broad-to-narrow approach, starting with an analysis of lesson plans based on Gagne's framework. Participants reviewed strategies for teaching reading, listening, writing, and speaking, with particular attention to sentence structure, syntactic and lexical ambiguity, and techniques to avoid run-on sentences. Additionally, paragraph structure, cohesion, and coherence were examined and practiced.

The training sessions were led by an experienced trainer from the B-TAG Training Delivery Team along with district QAED subject specialist.

A brief overview of each day's training session is as follows:

DAY 1:

The first session focused on the introduction and practice of Second Language Teaching and approaches to Teaching English as a Second Language (ESL). A social constructivist approach was consistently applied, emphasizing the importance of teaching English in a contextualized and holistic manner.

Participants engaged in a Bingo activity to get to know each other better, which served as an effective icebreaker. They were then introduced to the concept of the social constructivist approach by engaging in another activity using newspapers. In this activity, they were required to create any shape using the newspapers and then describe what this shape represented in terms of their professional journey. This was a Think-Pair-Share activity, where participants first engaged in the activity on their own, then shared their professional journey with each other, and finally came up with a combined philosophy for their shared journey, discussing the motivators that had brought them to where they were today. This was an effective way to extrapolate their challenges and successes, consolidating their understanding of the social constructivist approach to language learning while acting as a bridge for subsequent concepts, contextualizing language learning and reiterating the CPD framework for elementary teachers.

The CPD framework was discussed in detail, and it was ensured that all participants were familiar with the four pillars of the CPD framework: Personal Learning Hours, Teacher Learning Forums, Classroom Observation, and Online Learning Communities. An in-depth understanding of each of the four components of the CPD framework was ensured, and participants were made aware of the importance of employing the CPD framework as a foundation for professional development to achieve a more collaborative and learning-centred culture.

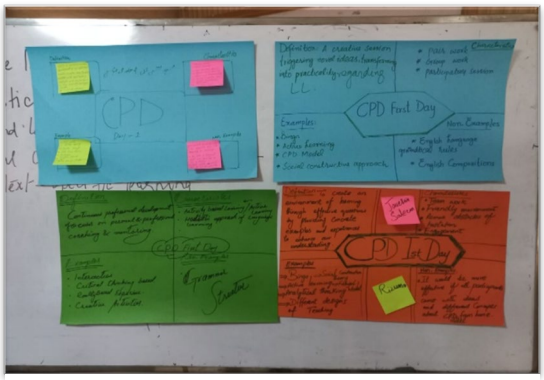


Figure 9: Participants displaying their work

The next session focused on the anatomy of a lesson plan. Participants were introduced to Gagne's Nine Events of Instruction, which involved an in-depth analysis of lesson plans using Gagne's framework. Working in groups, the participants evaluated the efficacy and effectiveness of classroom practices identified by Gagne. The next task involved analysing a lesson plan against Gagne's framework, identifying practices in the lesson plan that aligned with the framework. This exercise proved to be extremely useful in analysing a lesson plan. Participants provided valuable feedback, identifying areas for improvement as well as pointing out the strengths of the plan and the relevance of the selected text for the lesson. Following this, participants developed ideas for their own lesson plans and presented them to the group.

Day 1 ended with participants completing the Frayer's Model template to examine the highlights of their learning for the day. The formative assessment strategy employed to record learning was the Frayer's Model template, which is an analytical tool used to deconstruct

learning. Participants were encouraged to identify characteristics of an effective CPD, provide examples and non-examples, and finally develop a personalised definition of CPD. A Gallery Walk was conducted for participants to reflect on their learning during the first day of the CPD session. Finally, they were instructed to select an SLO from their curriculum and, keeping in view the "lessons learned," plan a lesson incorporating Gagne's Nine Events of Instruction.

Day 2

The day began with presentations of the homework. Each group shared their ideas, followed by a Q&A session where other groups had the chance to ask questions and clarify uncertainties. The concept of multiple intelligences was introduced through a self-assessment survey, allowing participants to reflect on their dominant intelligences. They reviewed the indicators of the eight intelligences and identified the most prevalent ones within their groups, documenting their findings on table mats.

Participants were then divided into groups and given a lesson plan based on Pakistan's national animal, the Markhor. The lesson was structured around the eight intelligences, and participants were tasked with analysing the objectives, content, pedagogy, and assessment for the assigned sections. The next segment on the second day focused on the importance of active and analytical listening. A fruitful discussion emphasized the four essential skills, highlighting listening as perhaps the most crucial.

Figure 10: English Training Session in progress

To demonstrate the significance of active listening, participants watched a video on the topic and completed a related worksheet. Following this, participants were introduced to the three purposes of listening: to inform, persuade, and entertain. Three different videos were shown, after which participants identified the purpose, audience, and function of each video through a worksheet. A discussion followed to consolidate their understanding of active listening and address any challenges they faced. This included insights into features that enhance listening, such as effective body language, backchanneling, and the use of fillers.

After this thorough discussion on listening skills, the focus shifted to writing skills. This session started with exploring sentence structure and strategies for constructing cohesive and meaningful sentences. Key aspects of coherence and cohesion were explored in depth, with participants being shown examples of syntactic and lexical ambiguity. They were also introduced to the concepts of dangling modifiers and run-on sentences, along with practical ways to avoid such errors. Through various practical and interactive activities, participants applied their understanding to formulate complex and compound sentences, keeping in mind parallel structures, subject-verb agreement, consistency in tense form, and aspects of cohesion and coherence.

After an in-depth study of sentence structure, the session progressed to paragraph structure and its various components: topic sentence, supporting details, and concluding sentence.

These components were introduced through a visible learning strategy—a burger to visualise the paragraph structure. Participants were encouraged to think of innovative ideas to grab the interest of their audience and keep them engaged throughout the sessions by employing innovative strategies. Day 2 ended with participants being assigned homework to devise a

Figure 12: Group Work in progress

Figure 12: Trainer's and participants' discussion

lesson plan around the intelligence they had worked on earlier in their group.

Day 3

The day began with a recap of the previous two days' learning. Following this, group presentations were conducted, during which participants shared their lesson plans aligned with the selected Student Learning Outcomes (SLOs) and assigned intelligence. A productive discussion ensued, addressing the strengths and weaknesses of the plans presented. The focus then shifted to the upcoming online microteaching sessions that participants were expected to conduct via Microsoft Teams for two groups of assigned participants. Time was allocated for the development of these sessions, and participants were informed that they would be required to conduct a simulation using the online format. The remainder of the day was dedicated to refining their sessions for the virtual environment and familiarising them with the Teams platform. While the day concluded with feedback on their preparations, time constraints prevented the full simulation of the online sessions.

The three-day subject-specific training sparked interest and curiosity among participants to develop sessions for elementary school teachers that incorporate innovative strategies and integrate the concepts covered over the past three days. The feedback received was positive and encouraging.

Iftikhar Ahmad

English Subject Expert

We are currently in a three-day CPD-EST training session, and we've learned a great deal. This training has provided a thorough understanding of the CPD framework for ESTs. One of the key insights for me was the importance of the 'teaching techniques' in helping students grasp concepts. Our trainer, Ms. Mushhadi showed us how to use the video clips to convey the underlying messages, purposes, and important lessons, which will be very impactful when we use them with teachers.

Another highlight was learning how to use concrete examples to help students understand concepts. Ms. Mushhadi gave a memorable example with a 'burger' analogy to explain paragraph writing. She explained that the top bun represents the topic sentence, the layers in the middle (like cheese and toppings) are the supporting details, and the bottom bun is the conclusion. This example made it easy to visualise the structure of a paragraph.

Finally, we also learned how to conduct online sessions effectively, using modern technology and maintaining a professional demeanor during virtual interactions.

- **Training of Math Subject Experts**

The training was delivered to 13 Subject Experts on August 27 to 29, 2024. The CPD session aimed to equip elementary mathematics Subject Experts with a comprehensive understanding of the Continuous Professional Development (CPD) model and its key features designed specifically for elementary teachers. Participants explored essential aspects of the CPD framework, including the role of active learning in enhancing professional growth, the significance of Teacher Learning Forums as collaborative spaces, and the pivotal role that Subject Experts play in supporting the development of effective teaching practices. Additionally, the session provided insights into the components and new indicators of the Classroom Observation Tool (COT), enabling teachers to align their instructional strategies with current subject-specific practices to improve classroom effectiveness.

The training sessions focused on strengthening participants' skills to conduct engaging and interactive online learning sessions, equipping them to navigate the shift toward digital education with confidence. Through the exploration of various online tools and techniques, Subject Experts were better prepared to foster a more dynamic virtual learning environment.

Participants also examined the differences between andragogy and pedagogy, recognising traits of adult learners that are crucial for planning effective professional development. The training guided subject experts in using the ADDIE model to systematically plan, develop, and implement training sessions, enhancing the overall quality of professional learning experiences.

Furthermore, the training sought to enhance teachers' professional competencies by introducing a range of instructional practices, including the Concrete-Pictorial-Abstract (CPA) approach, inquiry-based learning, the Math Lab approach, and problem-solving techniques. Emphasis was placed on understanding how to achieve mathematical proficiency through the five strands: conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition.

The sessions were conducted by an experience trainer from the B-TAG Training Delivery Team.

Day 1

On the first day, the focus was on enhancing Mathematics Subject Experts' professional skills through innovative instructional strategies and the exploration of the CPD model components. The day began with a Bingo activity, serving as an effective icebreaker for participants to get

to know each other better. Following this, participants completed a Pre-Assessment form to gauge their understanding before the training began. Establishing group norms was essential, and participants collaboratively selected 6-7 common rules to guide the workshop. The introductory session on the CPD model emphasised its four main pillars: Personal Learning Hours, Teacher Learning Forums, Classroom Observation, and Online Learning Communities. Participants engaged in a Jigsaw activity, dividing into three groups to study and create visual mind maps of the CPD Model Handout. Each group then presented their findings, ensuring a comprehensive understanding of the framework.

To reinforce active learning as a central theme throughout the CPD training, the K-W-L (Know, Want to know, Learned) activity was utilised. The training incorporated numerous active learning techniques, including hands-on activities, collaborative problem-solving tasks, and reflective exercises, allowing participants to experience the benefits first-hand. Teacher Learning Forums were highlighted as vital components of the CPD framework, providing opportunities for collaborative learning and professional dialogue. Participants were divided into four groups to identify the roles of SEs and teachers in asynchronous and synchronous learning forums. They documented their roles on chart paper, allowing for a rich exchange of ideas as papers were circulated among groups. This collaborative simulation mirrored the environment typically found in Teacher Learning Forums, encouraging teachers to learn from one another.

The training also included a review of the existing Classroom Observation Tool (COT) and the updating of subject-specific indicators. Participants utilised the online digital tool Mentimetre to create a word cloud, sharing their thoughts on the purpose of classroom observations. A matching exercise helped participants understand the 11 existing practices, followed by small group discussions on each practice. Participants were introduced to Subject-Specific COT indicators for mathematics, focusing on evaluating teaching practices on a scale from 1 (low) to 5 (high). In groups, participants analysed assigned COT indicators using rubric cutups, identifying observable characteristics at each performance level. Each group presented their findings, illustrating how various teaching practices align with different levels of the rubric. The session concluded with a handout clarifying Subject-Specific COT Indicators, reinforcing participants' understanding and preparing them to apply the COT effectively in classroom observations.

Figure 13: Group Work in Progress

In the final session, participants engaged in activities aimed at understanding the role of Subject Experts and the importance of online netiquettes. They recalled the responsibilities of Subject Experts in conducting online sessions, identified challenges faced, and brainstormed solutions collaboratively. Discussion on netiquettes highlighted strategies for enhancing online interaction. Participants ranked proposed solutions through a fun ranking game, emphasizing the importance of interaction in online learning. The day concluded with a reflective activity, where participants

shared key takeaways, challenges, and lingering questions, promoting ongoing improvement in their online teaching practices.

Day 2

On the second day, the session began with a recap of Day 1, setting a collaborative tone for the day. Participants formed a circle and engaged in a reflective activity using a softball, allowing each person to share insights gained from the previous day while passing the ball around. This interactive exercise fostered a sense of community and emphasized the significance of being a reflective practitioner in their teaching journey. The first main activity aimed to identify barriers to learning mathematics. Participants were divided into trios to brainstorm the various obstacles students face in mathematics education. After discussing their findings, they shared their thoughts with the larger group. Each trio then selected two barriers from the compiled list and developed strategies to overcome them, recording these suggestions on chart paper that was displayed for a gallery walk. Participants were encouraged to read each other's ideas and place stars next to the suggestions they found most compelling. To enrich the discussion, the trainer introduced eight effective teaching practices from the National Council of Teachers of Mathematics (NCTM), sparking vibrant conversations that encouraged participants to reflect on their own strategies and consider adapting new ideas.

Figure 14: Group Presentations

The next session involved an overview of the primary objectives of the National Curriculum 2022, emphasising the importance of instilling practical mathematical skills and reinforcing foundational abilities crucial for higher-level mathematics. Participants were introduced to the key strands of the curriculum, alongside various teaching methods, aiming to enhance their understanding of how these strategies can improve mathematical learning outcomes. Participants worked in pairs with a handout detailing effective teaching strategies. After reading the document individually, they discussed their insights with their partners. Pairs were then merged to share their preferred strategies. To facilitate ongoing discussions, an online Padlet board was established, allowing participants to post their favourite strategies as sticky notes and comment on each other's contributions, fostering a collaborative learning environment.

Participants were then divided into four groups; each assigned a different mathematics strand. Each group drew two teaching strategies from a box and prepared presentations on how to implement these strategies effectively. After a brief preparation period, each group presented their ideas and received constructive feedback from their peers, enriching the overall learning experience. The session transitioned into hands-on activities focused on the Concrete-Pictorial-Abstract (CPA) approach. Participants utilized manipulatives like coloured counters and bottle caps to explore mathematical concepts through tangible objects, creating various ratios that reinforced their understanding of the CPA approach's effectiveness in teaching mathematics. They then applied the CRAMATH method to plan a teaching activity

based on CPA, sharing their plans in a reflective discussion about which activities showcased the CPA method most effectively.

Figure 15: Participants engaging in diverse activities

In the final session, participants explored the significance of developing mathematical proficiency through engaging activities. They watched a video illustrating this method's application in teaching mathematics, followed by a group discussion to share key takeaways and reflections. The session then shifted to the ADDIE model for developing instructional training. Participants learned about six essential principles of adult learning. Afterward, they were divided into groups to brainstorm challenging topics for future monthly meetings. Each group selected a topic for which they would design a training session, utilizing provided handouts. They explored the five steps of the ADDIE model—Analysis, Design, Development, Implementation, and Evaluation—emphasising the importance of a structured approach for effective training. After completing handouts for each stage of the ADDIE model, groups presented their detailed plans, fostering peer feedback and discussions for improvement. The session concluded with participants preparing one-minute elevator pitches summarizing their learnings and facilitating peer discussions to reinforce the content. This collaborative approach ensured that participants left with a clear understanding of how to effectively apply adult learning principles in their training sessions.

Day 3

Figure 16: Participants listening attentively

The last day of the training aimed to deepen participants' understanding of teaching practices and the reflective cycle while equipping them to identify challenging Student Learning Outcomes (SLOs). The session began with an engaging “Board Race” activity that allowed participants to recall and articulate terms from the previous days, reinforcing their learning. Participants then brainstormed “reflective practices” in pairs, documenting their insights on a flip chart. They individually reflected on a workshop activity by answering guiding questions, facilitating a discussion about the importance of self-reflection in teaching. The trainer concluded this segment by explaining Gibbs’ Reflective Cycle, a structured framework for learning from experiences.

The session then focused on identifying challenging SLOs. Participants were prompted to name sources that provide data on teacher performance, such as Classroom Observation Tool (COT) data and module assessments. Divided into groups, participants downloaded the Grade 6 Mathematics Book and the Academic Calendar and selected an SLO they found difficult to

teach, creating a “List of Challenging SLOs” on chart paper. Each group shared their rationale for choosing their SLO. The session transitioned to an introduction to microteaching, defining it as a practice for reviewing teaching performance. Participants formed four teams to design an online microteaching session using digital tools, selecting a challenging SLO to analyse and choose an appropriate teaching strategy. This collaborative approach effectively engaged participants, enhancing their skills and preparing them for future teaching challenges. Time was allocated for the development of these sessions, and participants were informed that they would be required to conduct a simulation using the online format. The remainder of the day was dedicated to refining their sessions for the virtual environment and familiarizing them with the Teams platform. While the day concluded with feedback on their preparations, poor internet connection and time constraints prevented the full simulation of the online sessions. The session also covered the fundamentals of microteaching, outlining its benefits such as focused skill development and immediate feedback. By the end of the session, teachers were equipped with new strategies, digital tools, and insights to support their teaching practices, ultimately enriching their students' learning experiences in mathematics.

Labeeb Ahmad

Mathematics Subject Expert

First of all, it is commendable that the government has revitalised the CPD model, aiming to enhance the quality of education provided by our elementary teachers. This initiative has the potential to bring substantial improvements to the education system. The new features introduced in this model are distinct and significantly more effective than the previous ones, especially in terms of teaching strategy.

Initially, we applied these strategies at the primary level, but when we adapted them for the elementary level, we gained a lot of valuable insights. As subject experts, we also benefited greatly from this learning environment. I am optimistic that as we implement this model in the field, we will achieve excellent results. I hope these government-led pilot projects are successful, with Allah’s will, leading to positive transformations in our education system.

Training of Science Subject Experts

The training was delivered to 17 Subject Experts on September 2 to 4, 2024. The training aimed to equip the Science Subject Experts with innovative strategies for teaching science at the elementary level. The focus was on enhancing participants' professional competencies, introducing inquiry-based learning models, and integrating collaborative and project-based learning approaches into the science classroom. Additionally, the training provided participants with effective online teaching practices to foster engagement in remote learning environments. The training also aimed at preparing the Subject Experts to facilitate and enhance the professional competencies of selected teachers across the chosen districts as part of the CPD for ESTs. Given that many current elementary teachers have limited professional development opportunities and are often not fully prepared for an elementary

classroom, it is hoped that this team will be able to provide valuable guidance to these teachers.

The training was delivered by an experienced trainer from the B-TAG training delivery team facilitated by district QAED officials.

Day 1

Day 1 started with an ice-breaking activity, a Bingo game, so that the participants could know each other. The main aspects of the first day included an introduction to the CPD model, where participants explored its salient features and significance for elementary school teachers. The critical role of subject experts in enhancing the professional growth of teachers was highlighted. Participants engaged in discussions and reviewed handouts outlining the CPD model, fostering an understanding of its key components through Jigsaw reading strategies. The concept of active learning and its relevance within the CPD model was also discussed, with participants exploring effective strategies to encourage active participation in professional development sessions. A K-W-L chart activity was used to engage participants in defining active learning, sharing prior knowledge, and identifying new insights.

The day also focused on the importance of Teacher Learning Forums as spaces for sharing experiences and promoting collaborative learning among educators. Participants worked in groups to discuss the role of Teacher Learning Forums and presented their understanding to their colleagues. They were reminded of their role as Subject Experts in moderating these forums and supporting peers through synchronous and asynchronous learning activities. Discussions on the responsibilities of Subject Experts helped participants understand their critical role in the CPD process. Participants were introduced to the various components of the Classroom Observation Tool (COT), including the new subject-specific indicators. Examples for these indicators were discussed at length to ensure understanding of their application in improving science classroom teaching practices. The importance of conducting online sessions effectively was also discussed, with participants practicing the use of online tools to enhance virtual engagement, such as interactive polls and chat functions. This strategy continued on subsequent days, where participants were encouraged to use digital platforms to become more comfortable with them. Throughout the day, emphasis was placed on ensuring participants understood the four pillars of the CPD framework: Personal Learning Hours, Teacher Learning Forums, Classroom Observation, and Online Learning Communities.

Figure 18: Participants engaged in Group Work

Figure 17: Trainer guiding the Group Work

Day 2

The second day focused on implementing inquiry-based and project-based learning in science classrooms. Participants explored teaching strategies aligned with learning outcomes to enhance student understanding and engagement. They reviewed sample learning outcomes and collaboratively identified effective strategies for achieving them. The 5E instruction model of inquiry-based learning was introduced, and participants practiced designing lessons using this model to promote exploration, engagement, and evaluation in science education. They worked in groups to create lesson plans using the 5E model and shared their plans for peer feedback. The importance of project-based learning as a tool for promoting collaboration and critical thinking was also discussed.

Participants engaged in activities where they designed and presented project-based learning plans, focusing on real-world problems to enhance critical thinking. Participants reviewed the steps of effective lesson planning and developed their lesson plans using both traditional and online methods, incorporating the 5E model of inquiry-based learning.

Microsoft Teams was used for lesson planning and presentations, providing participants with practical experience in delivering virtual content. A hands-on activity demonstrated the application of problem-based learning techniques, where participants collaborated to solve a scientific problem, thereby reinforcing the concept of active, inquiry-driven learning.

The second day concluded with an introduction to micro-teaching, and participants were informed of the strategy that would be used to deliver these sessions, ensuring they could come prepared.

Figure 20: Group Work in progress led by Group Leader

Figure 19: Group Presentation

Day 3

The final day of the workshop focused on microteaching, assessment, and further developing online instructional skills. Participants were made aware of how they could use data from various teacher evaluation tools to identify challenging Student Learning Outcomes (SLOs) and discussed strategies for effectively addressing these challenges.

Microteaching was formally introduced as an instructional technique that helps educators enhance their skills through focused practice sessions. Participants were guided on how to

plan and deliver a microteaching lesson using digital tools. Since most participants were already familiar with the protocols for these sessions, the time allocated for this segment was extended to planning their microteaching practice.

Participants then developed and delivered an online microteaching lesson, receiving feedback from peers and facilitators. They were divided into groups of four, with each group tasked with generating online links, using digital tools, and applying appropriate screen sharing and online resources for the session. The SLOs were assigned randomly to each group. Following each group's session, detailed feedback was provided by the facilitator and peers, identifying challenges and discussing strategies for resolution. The session extended beyond the scheduled time by about 40 minutes to ensure that each group's microteaching session was completed appropriately, and feedback was given comprehensively. This exercise provided participants with a valuable opportunity to practice the skills learned over the three days and refine their online teaching techniques.

The participants appreciated the engaging nature of the training and the emphasis on practical application. Many expressed interests in additional workshops focusing on digital tools for science education and advanced inquiry-based learning strategies. A follow-up session should be considered to provide continued support and reinforce the implementation of the strategies learned during the workshop.

Shahzina Qayyum
Science Subject Expert

This has been a very impressive training session. The quality of students depends on the quality of education they receive, so it is essential to equip teachers with the skills to effectively impart subject knowledge. Over these three days, we gained a clear understanding of our role as subject experts. Our trainers showed us how to engage teachers at their level, introduced us to online learning tools, and provided many practical examples that enhanced our learning. Overall, it has been a valuable and impactful experience.

Results & Findings on The Effectiveness of Training

Pre- And Post- Training Scores

The effectiveness of the CPD-EST Pilot was evaluated through pre- and post-assessment scores of teachers across three subjects—English, Mathematics, and Science. The assessments aimed to measure improvements in teachers' competencies and instructional practices because of their participation in the CPD training.

The average pre- and post-assessment scores in English, Mathematics, and Science demonstrate significant improvements. This data is represented in the chart in Figure 1.

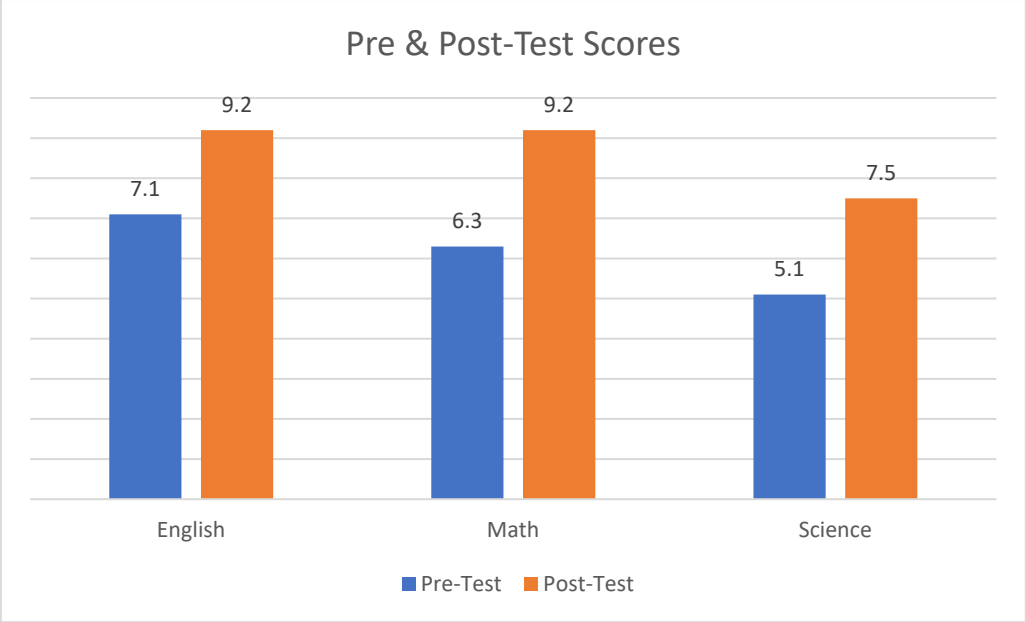


Figure 21: Pre and Post Assessment Scores

In English, the average pre-assessment score was 7.1, while the post-assessment score increased to 9.2, indicating a substantial improvement in teachers' content knowledge and teaching practices. This represents a 30% improvement, showcasing that the training effectively aligned with its proposed outcomes, fostering a deeper comprehension of teaching methodologies that can lead to more engaging and effective instruction.

In Mathematics, the average pre-assessment score was 6.3, which rose to 9.2 after the training, reflecting a remarkable 46% increase. This significant enhancement underscores the training's capacity to address critical gaps in mathematical understanding and instructional practice. The strong improvements in Mathematics indicate that the targeted interventions were highly effective in enhancing teachers' proficiency in both mathematical content and pedagogical strategies.

In Science, the average pre-assessment score was 5.1, which improved to 7.5 post-training, highlighting a 47% improvement. This increase demonstrates that the training successfully equipped teachers with enhanced pedagogical strategies that can be applied in their classrooms. Although the improvement in science was less pronounced compared to English and Mathematics in terms of absolute scores, the percentage increase was the highest, suggesting a significant enhancement in teachers' competency in delivering scientific concepts.

Overall, the assessment results provide compelling evidence of the training programme's effectiveness, showcasing substantial gains in participants' knowledge and skills across all subjects. These results indicate that the CPD-EST Pilot had a positive impact on teachers' instructional abilities across all three subjects. The increase in scores suggests that the structured training sessions, hands-on activities, and classroom observation feedback effectively addressed the teachers' developmental needs. The observable improvements in assessment scores validate the training's relevance and effectiveness, suggesting that it is

instrumental in fostering reflective teaching practices and creating an enriched learning environment for students.

Training Feedback

In English, most participants expressed satisfaction with the quality of the trainer, training content, materials, and the level of engagement in activities. However, many felt that three days were insufficient to cover the material fully and requested an extension. To address this, follow-up training sessions will be organised for subject experts during the pilot phase. Detailed feedback is given below (on a Likert scale of 0 to 4):

Figure 22: English Training Feedback

Math received the highest overall satisfaction scores as shown in figure 23, with participants appreciating the relevance and quality of content, the trainer's expertise, and the training methods used. Some participants noted, however, that more time would be beneficial to thoroughly absorb the content and discuss challenges, further highlighting the need for refresher sessions.

Figure 23: Mathematics Training Feedback

For Science, participants showed great satisfaction with the trainer's expertise, the quality of interactive activities, pacing, and training materials, finding the content highly relevant. A few participants suggested that some examples and case studies could be improved to better illustrate key points. Detailed feedback is given below:

Figure 24: Science Training Feedback

A common challenge for all groups was connectivity, as there was no central internet at district QAED. Participants often relied on weak mobile hotspots, leading to improvisations like group work, which sometimes limited individual learning opportunities.

Pre-Observations by Independent Observers

The pre-observation phase was a critical component of the CPD-EST Pilot, focusing on assessing the existing teaching practices across a sample of 50 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 were conducted with careful consideration of specific qualification criteria, including subject expertise, relevant teaching experience, and proficiency in data collection methods. This ensured that the observers possessed the necessary skills to accurately evaluate teaching practices. The selected observers were tasked with providing an objective analysis of classroom dynamics and instructional quality, setting the foundation for subsequent interventions.

Training of the Independent Observers on Subject-Specific Tools

Following the selection process, the independent observers underwent targeted training on the subject-specific Classroom Observation Tools (COT). 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 and the respective Head Teacher (HT), who utilised the subject-specific COT to evaluate teaching practices. The primary purpose of these observations was to capture a baseline of teaching practices at the start of the intervention. Additionally, the observations aimed to identify the training and capacity-building needs of Head Teachers, essential for their roles as instructional leaders.

The pre-observation process commenced in September 2024. Post-observation assessments will be done in March at the conclusion of the pilot. This timeline will allow for a systematic approach to data collection, with the findings providing valuable insights into whether the Head Teachers' assessments aligned with those of the independent observers. If the observations matched, it indicated that the Head Teacher had a sound understanding of the specific tools; conversely, discrepancies suggested a need for further training and development in utilising the COT effectively. Overall, the pre-observations set the stage for meaningful insights into the current educational landscape and informed subsequent professional development initiatives.

Pre-Observation Results

Our analysis of pre-observations reveals that the overall teaching score, combining general practices and subject-specific indicators across all three subjects, is **3.18.** Looking at each of the dimensions; the mean score of general practices is found to be **3.36**, with subject wise mean scores for relevant subject teachers are found as follows:

- 3.32 for English,
- 2.98 for Mathematics, and
- 2.85 for the subject Science.

District wise disaggregation show a little variation to the overall averages. The mean score for teachers in district Sheikhupura is above the overall average with value of 3.23, while for district Nankana Sahib, it is 3.09. Similar trends are observed when looked at subject wise numbers.

- In district Sheikhupura,
    - Mean score of general practices is 3.38
    - Mean score for English is 3.41
    - Mean score for Mathematics is 3.01
    - Means score for the subject Science is 2.96

- In district Nankana Sahib,
    - Mean score of general practices is 3.30
    - Mean score for English is 3.13
    - Mean score for Mathematics is 2.92
    - Means score for the subject Science is 2.64

The table below presents the status of overall and subject specific teaching practices.

Table 2: Summary of teaching scores by practices and district

Category	Indicator / Practice	Overall Teaching Score	Sheikhupura	Nankana Sahib
General Practices (GP)	1. Objectives articulation	3.42	3.46	3.34
	2. Clear content explanation	3.50	3.50	3.51
	3. Real-life connections	3.37	3.35	3.42
	4. Teacher modeling	3.29	3.33	3.22
	5. Understanding assessment	3.37	3.41	3.28
	6. Monitoring student progress	3.27	3.35	3.11
	7. Teaching adjustments	3.43	3.43	3.45
	8. Clarifying feedback	3.31	3.38	3.18
	9. Thinking questions	3.40	3.43	3.35
	10. Thinking tasks	3.30	3.28	3.32
	11. Responding to needs	3.24	3.31	3.11
	Mean Score – General Practices	**3.36**	**3.38**	**3.30**
English	1. Innovative English strategies	3.29	3.38	3.13
	2. Critical and creative responses	3.34	3.44	3.13
	Mean Score - English	**3.32**	**3.41**	**3.13**
Math	1. Math connections	2.94	2.97	2.88

	2. Problem-solving facilitation	3.04	3.09	2.94
	3. Practice and problem-solving opportunities	3.02	3.09	2.88
	4. Mathematical concept representation	2.92	2.88	3.00
	Mean Score - Math	**2.98**	**3.01**	**2.92**
Science	1. Science concepts explanation	3.18	3.25	3.06
	2. Scientific method engagement	3.11	3.32	2.69
	3. Demonstration of procedures incorporating safety	2.80	2.83	2.75
	4. Science-technology-society connections	2.30	2.43	2.06
	Mean Score - Science	**2.85**	**2.96**	**2.64**
OVERALL MEAN *		**3.18**	**3.23**	**3.09**

* The overall mean is weighted average of the mean scores of each category/subgroup.

Category Wise Teaching Scores

In each tool, there were two subsections/groups or categories including (i) general practices, and (ii) subject specific practices.

The first subgroup contains 11 indicators and focuses on general teaching practices, capturing essential aspects of classroom instruction. These include the teacher's ability to clearly articulate lesson objectives, explain content accurately, and connect it to students' daily experiences. Additionally, it assesses the teacher's use of modelling, questioning, and monitoring strategies to gauge student understanding. The subgroup also covers how the teacher adjusts instruction based on student needs, provides feedback, and fosters critical thinking through both questioning and task design.

Figure 25: Teaching score on general practices

Although the overall average for general practices is 3.36, there is significant variance at the individual practice level. Overall, teachers performed best on practice 2 i.e., explaining the content they are teaching, and they scored lowest on practice 11, which relates to responding to students' needs promptly and effectively.

The second subgroup focuses on subject-specific practices.

- In English, the questions assess how teachers build on previously acquired language skills, using innovative strategies to enrich learning experiences and encouraging students to think critically and creatively in response to various texts.

- For Mathematics, the questions explore how teachers link prior knowledge to new concepts, guide students in understanding and solving problems with multiple approaches, provide opportunities for practice, and represent mathematical concepts through visual and abstract methods.

- In Science, the tool captures the teacher's ability to explain core scientific principles using accurate terminologies, engage students in scientific inquiry and problem-solving, conduct investigations safely, and highlight the interconnections between science, technology, and society.

The below graph shows mean scores on subject specific indicators.

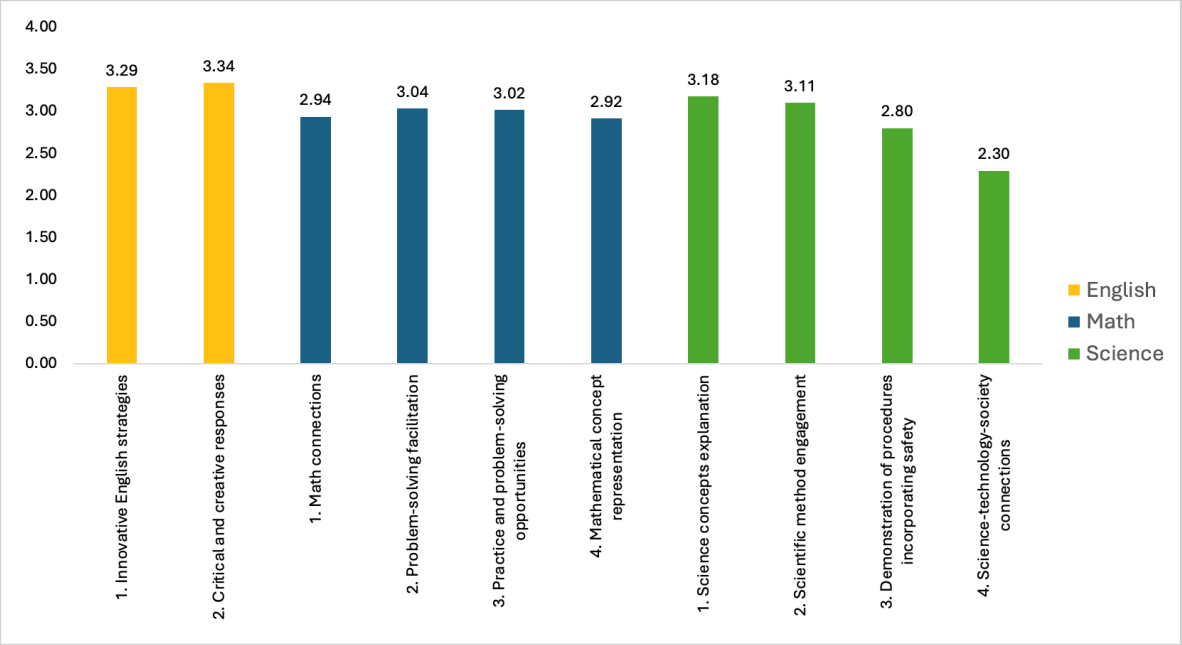


Figure 26: Teaching scores by subject

For English,

- The overall mean score of teachers for subject specific indicators was 3.32 with,
    - 3.29 mean score for teachers effectively building on previous knowledge through innovative strategies to enhance student learning, and
    - 3.34 mean score for teachers' ability to enable students to respond critically and creatively.

For Math,

- The overall mean score of Math teachers for subject specific indicators was 2.98 with,
    - Mean score of 2.94 for creating meaningful linkages between previously acquired mathematical concepts and new learning through different teaching strategies such as inquiry-based teaching method,
    - Mean scores of 3.04 for ability to helping students make sense of mathematical problems by enabling them to understand the meaning of a problem and identifying multiple solutions,
    - Mean score of 3.02 for aptly providing sufficient opportunities for practice and problem-solving for key concepts, and
    - Mean score of 2.92 for concluding the mathematical problem by representing the concept through diagrams, graphs, flowcharts, etc.

For Science,

- The overall mean score of science teachers was 2.85 with,
    - Mean score of 3.18 for ability to explain the fundamental concepts, principles, and interconnections of the life sciences, the physical sciences, the environmental sciences, and earth and space science using scientific terminologies,
    - Mean score of 3.11 for using strategies to engage students in scientific method of studies enabling students to develop solutions to problems through observation, reasoning and investigation,
    - Mean score of 2.80 for demonstrating principles and procedures related to the design and implementation of scientific investigations incorporating safety practices,
    - Mean score of 2.30 for promoting a deep understanding among learners about the intricate connections between science, technology, and society.

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 below presents distribution of ratings across 5 levels for 11 general teaching practices.

Figure 27: Distribution by levels for general practices

In previous section, it was observed that the highest overall average was for practice 2 i.e., clear explanation of content with mean score of 3.50 while the lowest mean score was for practice 11 with value of 3.24. Here, we note that in confirmation to the previously described findings, ~50% of the teachers were rated at highest two categories i.e., medium-high or high on practice 2. Similarly, for practice 11 ~66% of the teachers were rated as medium or below i.e., medium, medium-low, or low.

The distribution further shows that majority of the teachers are rated at middle categories, i.e., medium with close to 50% teachers being rated at medium 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 as under.

English:

For 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, 77% were rated at 'medium' level of skill for using innovative strategies to build on previously learnt knowledge and 69% were rated as 'medium' level for enabling students to respond critically and creatively.

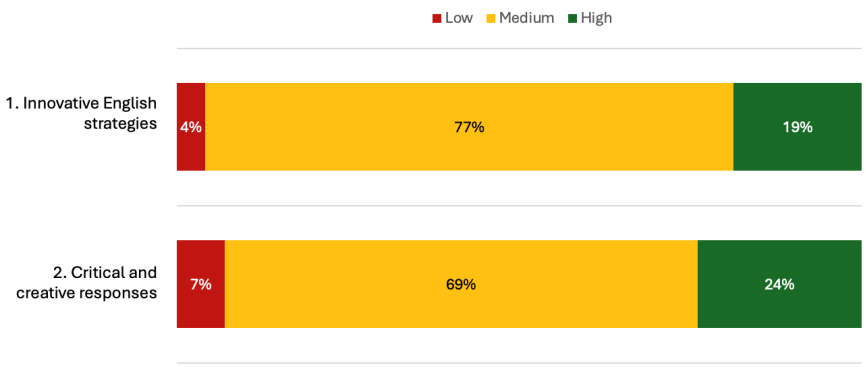


Figure 28: Distribution by levels for English

Math:

Similar patterns are observed for Mathematics teachers, with majority of observation values being as 'medium'; 81% for building connections, 78% for facilitation of problem solving, 69% for providing problem solving opportunities, and 76% for representing mathematical concepts using graphs etc.

Figure 29: Distribution by levels for Mathematics

Science:

Majority of observations with science teachers for subject specific indicators, as for other teachers, is rated at 'medium' level, with a significantly large proportion of observations showing lack of ability of science teachers to developing understanding of intricate connections between science, technology, and society among students with 36% observations as 'Low' on this practices/indicator.

Figure 30: Distribution by levels for science

Conduct of Synchronous Learning Forums & Joint Classroom Observations

Following the training and assigning[5] of school to Subject Experts, they were directed to conduct synchronous learning forums and joint Classroom Observations.

Subject Experts conducted their first sessions in October with their assigned 30 teachers in groups of 15 each. The session was informed by classroom observation data collected by teachers and shared by QAED with them. The sessions were mostly introductory and focused on CPD basics along with added indicators of the COT and talked about teacher challenges with them with durations between 60 minutes to 120 minutes.

5

Additionally, Subject experts visited schools and conducted joint classroom observations with headteachers giving them feedback on their observations.

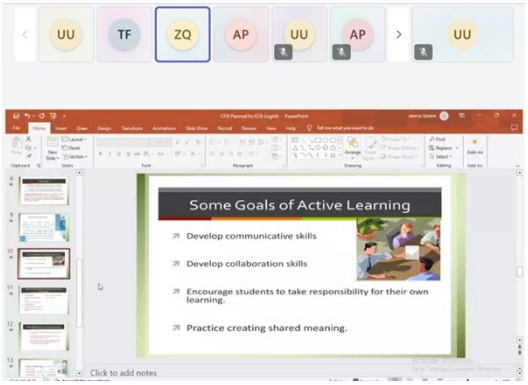


Figure 32: Javeria Saleem, SE English, discussing active learning with her teachers

Figure 31: Abdullah Khalid, SE Science, introducing CPD model for ESTs

Figure 34: Muhammad Ahmad, SE Math conducting joint classroom Observation

Figure 33: Shahzina Qayyum, SE Math, conducting joint classroom observation

Teachers' Professional Development Forum – District QAED Sharaqpur

The Teachers' Professional Development Forum held on the 19th October marked a significant milestone in advancing developing teachers' communities of practice (COP) in the province. Organised by the district QAED Sharaqpur, with technical assistance from BTAG, the forum aimed to celebrate the achievements of teachers, headteachers, and subject experts who actively contributed to the CPD-EST initiative. Focused on fostering a culture of continuous learning and collaboration, the event provided a platform to showcase innovative teaching strategies, share best practices, and strengthen the role of Communities of Practice (CoPs) in teacher development. Through engaging discussions, presentations, and knowledge-sharing sessions, the forum emphasised the importance of sustained professional growth to improve student outcomes and enhance the overall quality of education in Punjab. Some of the details of the forum are given below. The event agenda included keynote speeches, panel discussions, breakout sessions, and round table knowledge exchanges, all designed to foster peer learning and innovative idea generation.

Objectives

- Showcase best practices and innovations in teaching.
- Encourage dialogue and collaboration among teachers, headteachers, and subject experts.
- Promote the importance of ongoing professional development.

The conference served as a platform to promote Communities of Practice (CoP), encouraging collaborative learning among teachers and aimed to highlight the role of CoPs in professional development and share practical insights into teaching methodologies. The forum's agenda (annexed below) included a variety of sessions ranging from keynote speeches to hands-on breakout workshops, covering all essential aspects of the CPD framework.

The conference was attended by key officials, including Mr. Farhat Hussain Farooq, Additional Secretary ER SED, and Mr. Tajammal Abbas Rana, DG QAED Punjab, CEO Sheikhupura, District QAED Sharqpur Head Ms Naveeda Zia along with teachers, headteachers, subject experts, and representatives from QAED Sharaqpur.

The conference unfolded through a series of dynamic sessions, designed to provide both theoretical insights and practical applications for teachers and education professionals. The proceedings are narrated below:

Registration and Networking

The event began with registration and networking, allowing participants to connect and exchange ideas informally.

Opening Remarks

Mr. Ghulam Farid, Provincial Lead for B-TAG, set the tone for the day with a compelling speech that emphasised the critical role teachers play in shaping students' futures and the importance of continuous professional development for every teacher in the education system. He emphasised the significance of peer learning and continuous development.

Keynote Speech

Mr. Farhat Hussain Farooq, Additional Secretary, stressed the importance of training in teaching, drawing parallels to the early days of Islamic education and underscoring the essential role of teacher training in sustaining educational excellence. He stressed that without training, teaching gradually diminishes in effectiveness.

Plenary Talk

In his plenary talk, Mr. Tajammal Abbas Rana, DG QAED, outlined the ongoing CPD efforts in Punjab, highlighting the large-scale implementation of CPD programs and the government's commitment to teacher development. He highlighted QAED's efforts to reach across 450,000 teachers and 50,000 schools. He added that this conference was a step towards ensuring the

successful implementation of CPD practices at the elementary level, furthering the professional growth of teachers.

Panel Discussion: Role of Communities of Practice in Teacher Development

Moderated by Dr. Shakeela Parveen, Deputy Director (Field) QAED, the panel discussion focused on the pivotal role of Communities of Practice (CoPs) in promoting and enhancing professional development among teachers. This engaging session brought together a diverse group of panellists, including experienced teachers, headteachers, and subject experts, who shared their insights and experiences regarding the impact of CoPs on educational practices. The panellists included: Ms. Naveeda Zia, District QAED head, Shahzina Qayyum, Subject Expert Math, Dr. Shahbaz Hameed, Subject specialist English, District QAED Sharaqpur, Beenish Iftikhar, headteacher and Anam Khan, Elementary School Teacher.

The discussion began with a brief overview by Dr. Shakeela of what Communities of Practice entail, emphasising their significance as informal networks where educators come together to share knowledge, experiences, and best practices. Panellists highlighted that CoPs serve as essential platforms for collaboration, fostering a sense of community among educators who may otherwise feel isolated in their individual classrooms.

One key point of discussion was the role of CoPs in overcoming communication barriers. Panellists noted that traditional hierarchical structures in schools often hinder open dialogue and collaboration. However, CoPs encourage a more egalitarian approach, allowing teachers to express their ideas and concerns freely. This open communication not only helps build trust among educators but also enhances the sharing of resources and strategies.

The panellists emphasised that CoPs facilitate formative learning, where teachers engage in reflective practices and continuous improvement. This process allows educators to learn from one another, adapting and refining their teaching methods based on shared experiences and feedback. Such collaborative learning environments encourage experimentation and innovation in teaching strategies, ultimately benefiting students.

A significant part of the discussion focused on how CoPs lead to the practical implementation of innovative teaching strategies. Panellists shared specific examples of successful practices developed within CoPs, illustrating how teachers have collaboratively designed lesson plans, integrated technology, and created engaging classroom activities that cater to diverse learning needs. By pooling their collective expertise, educators have been able to introduce fresh approaches that enhance student engagement and learning outcomes.

Furthermore, the panel highlighted the critical role of subject experts within CoPs. These experts act as facilitators and mentors, guiding their peers in adopting effective teaching practices. Their leadership helps to ensure that discussions remain focused and productive, while also providing teachers with access to up-to-date research and resources that can enhance their instructional methods.

Figure 35: Panel Discussion in progress

Breakout Sessions

Participants broke into subject-specific breakout sessions, focusing on the practical application of teaching strategies in English, Math, and Science. A seminar, jointly led by BTAG and QAED subject experts, covered key strategies such as reading strategies for English, inquiry-based learning, collaborative learning, and storytelling techniques for math and science education.

Key Points from Breakout Sessions:

- **English:** Focused on reading strategies and practical classroom applications.
- **Math:** Explored mathematical mindsets and shifting perspectives.
- **Science:** Emphasised inspiring student curiosity and engagement with scientific concepts.

Round Table Knowledge Exchange – Group Presentations

A significant highlight of the CPD-EST Conference was the **Round Table Knowledge Exchange** session, which focused on subject-specific strategies for teaching English, Math, and Science. This session provided a platform for teachers, headteachers, and subject experts to present and discuss practical implementations of teaching strategies they had adopted in their classrooms as part of the CPD framework. The participants' presentations were a testament to their commitment to improving educational outcomes by applying the strategies they had learned through continuous professional development.

Implementation of English Teaching Strategies – Lessons from Classroom Practice

The English Round Table focused on the practical application of reading and comprehension strategies to create a more interactive and student-centered learning environment.

- **Table 1**: Dr. Shahbaz Hameed presented innovative strategies for teaching sentence structure.

- **Table 2**: Muhammad Afzal discussed paragraph writing, explaining techniques authors use to persuade, inform, or entertain.

- **Table 3**: Mussarrat demonstrated methods for teaching sentence structure, including addressing lexical and syntactic ambiguities.

Participants in this session were highly motivated and saw the value in continuous training. They highlighted the importance of a Community of Practice (CoP) as an essential platform for sharing knowledge and experiences. As Afzal noted, “Community of practice produces valid knowledge, and demonstrating teaching practices is key to effective knowledge transfer."

Implementation of Math Teaching Strategies – Lessons from Classroom Practice

The Math Round Table was particularly focused on overcoming the challenges of teaching mathematical concepts in large classrooms. Teachers shared that, while motivated to learn, they faced challenges in translating training into classroom practice due to the complexities involved.

- **Table 1**: Iqra explained Active Learning as part of the CPD programme, demonstrating how to use real-world problems and storytelling to make abstract concepts relatable.

- **Table 2**: Labeeb Ahmad presented the Concrete-Pictorial-Abstract (CPA) approach and inquiry-based learning. Teachers applied project-based learning, where students collaborated on mathematical problems, which proved especially effective in teaching geometry and fractions.

- **Table 3**: Shahzina Qayyum showcased the use of hands-on manipulatives and visual aids like charts and models. This tactile approach allowed students to interact with the material in groups, deepening their understanding.

Teachers noted challenges with long-term implementation due to large class sizes and outdated training materials. The CoP enabled teachers to refine their strategies collaboratively. As Shahzina commented, "All of this will be fruitful if we implement what we have learned here."

Implementation of Science Teaching Strategies – Lessons from Classroom Practice

The Science Round Table highlighted strategies for making science lessons more engaging and hands-on.

- **Table 1**: Iqra Yaseen presented the 5E Instructional Model (Engage, Explore, Explain, Elaborate, Evaluate), which she structured to capture student interest with activities, followed by exploratory experiments and concept clarification.
- **Table 2**: Rana Mubashir introduced the Scientific Method, providing tools to make abstract concepts like chemical reactions more accessible to students.
- **Table 3**: Adnan Faisal discussed project-based learning, where students conducted experiments and reported findings in collaborative groups, fostering critical thinking and problem-solving skills.

Teachers initially came with concerns but left excited to apply the strategies discussed. They appreciated the solutions provided through practical examples.

Across all subjects, presenters were committed to using innovative strategies to improve student engagement and learning outcomes. The Community of Practice encouraged teachers to share experiences and insights, thereby enhancing the quality of education they could provide. A recurring theme was the challenge of managing large class sizes, but teachers effectively discussed strategies like peer learning, project-based learning, and hands-on manipulatives to address this issue.

Collaboration among teachers and presenters emerged as a crucial component for success. Through group projects in math, peer discussions in English, and practical applications of concepts in science, the approach significantly deepened teachers' understanding. Teachers expressed the need for ongoing support, continuous training, and an expansion of Communities of Practice.

Final Consolidated Subject Presentations

In the final session, three presenters (one from each subject) presented consolidated findings from the round table discussions. The experts emphasised the importance of implementing the strategies discussed during the day, with Iqra Yaseen (Science), Muhammad Afzal (English), and Shahzina Qayyum (Math) sharing consolidated findings from their respective break-out sessions.

Certificate Distribution

Certificates were awarded to participants in recognition of their contributions to the CPD teachers discussion forum.

Closing Remarks

The day concluded with closing remarks by district QAED head Ms. Naveeda Zia that reiterated the importance of sustained professional development and the continued efforts of QAED in fostering a culture of learning and collaboration among teachers in Punjab.

The success of this forum highlighted the need for a series of similar events to be organised at both district and provincial levels. As part of the CPD-ESTs pilot programme, QAED, in collaboration with B-TAG, will continue to support teacher development through regular CoP sessions, focused workshops, and ongoing professional development initiatives.

Next Steps

Given the ongoing activities, the following steps are planned to continue through March 2024, supporting the pilot's objectives and evaluation:

1. Elementary School Teachers in Science, Math 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 reviewed and analysed along with the data from discussion forums 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. The classroom

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 professional learning forums** will be held, managed collaboratively by the provincial QAED and district QAEDs in both 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 Elementary School Teachers (ESTs) and approximately 32,000 students. This expansion will allow for a broader evaluation of the program'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 revise the CPD model. Based on the findings, **recommendations will be developed to refine the approach** and ensure its effectiveness for potential wider implementation.

Annexures

Annexure I: Piloting CPD-ESTs – Notification by the department

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sotraining.sed@gmail.com

NO.SO(TRG)2-17/2019(P)
GOVERNMENT OF THE PUNJAB
SCHOOL EDUCATION DEPARTMENT

Dated Lahore the 28th June, 2024

To

1. **The Director General,**
   QAED, Punjab.
2. **The Chief Executive Officers (DEA),**
   Sheikhupura & Nankana Sahib.

Subject: **PILOTING OF CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD) IN DISTRICTS SHEIKHUPURA AND NANKANA SAHIB**

I am directed to refer to the subject cited above and to intimate that Quaid-e-Azam Academy for Educational Development (QAED) with technical assistance from Bridging Technical Assistance from Governments (BTAG) is piloting a CPD model for Elementary School Teachers (ESTs) in two districts: Sheikhupura and Nankana Sahib. The CPD framework consists of following four activities:

i. **Personal learning hour:** Self-study through lesson plans and videos disseminated through the Training Management System (TMS).
ii. **Classroom Observations:** Observation and feedback sessions by HTs and district QAED officials on subject-subject Classroom Observation practices.
iii. **Teacher Learning Forums:** Asynchronous and synchronous learning forums moderated by Subject Experts, informed by teacher performance data.
iv. **Online Learning Communities:** Subject-specific teacher communities developed.

Subject Specific content in English, Mathematics, and Science has been uploaded for ESTs in these two districts.

2. You are therefore, requested to direct EST teachers (**list enclosed**) in your respective districts to login and start CPD course by 1st July, 2024 and access the CPD content by following the steps mentioned below:

Step 1: Go to the Play Store and download the QAED Application.

Step 2: Use your HRMIS SIS login details, i.e. User name and Password, and log into the system before 30th June.

Step 3: Select 'CPD for Elementary School Teachers' and select your subject from English, Mathematics, or Science.

Step-4: Complete module 1 by 20th July and attempt end-of-module assessment after completing the module.

28.6.24

SECTION OFFICER (TRAINING)

CC:

1. PS to Secretary, School Education Department.
2. PS to Special Secretary, School Education Department.
3. PS to Additional Secretary (ER), School Education Department.

Annexure-II: Subject-Specific Classroom Observation Practices

Indicator	Low (1-2)	Medium (3)	High (4-5)
English Practices			
12. The teacher builds on previously learnt English Language using innovative teaching strategies for richer learning experiences.	The teacher employs formulaic and uninspiring strategies to assess students' prior knowledge and partially builds upon new concepts, but fails to make meaningful connections between the two or adequately address learning gaps and deficiencies.	The teacher employs targeted and effective strategies with some innovation to assess students' prior knowledge and effectively builds upon new concepts, although without addressing all learning gaps and deficiencies.	The teacher utilizes targeted and innovative strategies adeptly to assess students' prior knowledge, effectively building upon new concepts while addressing learning gaps and deficiencies as necessary.
13. The teacher enables the students to respond critically and creatively to the given text type.	The teacher faces challenges in fully engaging students in comprehending and responding critically and/or creatively to the given text type, requiring further support and development in this area.	The teacher somewhat enables students to comprehend and respond critically and/or creatively to the provided text type, although there may be room for improvement in fully engaging students in these aspects.	The teacher effectively facilitates students' comprehension and encourages critical and creative responses to the provided text type, fostering deep engagement and insightful interpretations.

Math Practices			
12. The teacher creates meaningful linkages between previously acquired mathematical concepts and new learning through different teaching strategies i.e. inquiry- based, Math's Solutions, Discovery approach etc.	The teacher struggles to establish connections between previously learned mathematical concepts and new material. The attempts are limited, inconsistent, and fail to contribute significantly to students' understanding.	The teacher makes some effort to link current lessons with prior knowledge. While there are moments of connection, they may lack depth or consistency, resulting in a moderate impact on students' understanding.	The teacher excels in creating strong and consistent linkages between previously acquired mathematical concepts and new learning. These connections are well-developed, meaningful, and contribute significantly to enhancing students' understanding, fostering a cohesive learning experience.
13. The teacher helps students make sense of mathematical problems by enabling them to understand the meaning of a problem and identifying multiple solutions.	The teacher struggles to guide students in understanding the meaning of mathematical problems. The assistance provided is minimal, and there is a lack of emphasis on exploring multiple solutions.	The teacher makes some effort to help students make sense of mathematical problems. There is partial success in enabling students to understand problem meanings, and some exploration of multiple solutions is encouraged, but it may lack depth or consistency.	The teacher excels in helping students thoroughly understand the meaning of mathematical problems. They effectively guide students in identifying multiple solutions, fostering a deep comprehension of problem-solving strategies and encouraging a flexible approach to mathematical challenges.

14. The teacher provides sufficient opportunities for practice and problem-solving for key concepts (Content Strands: Number operations, Measurement and Geometry, Algebra and Data Handling) to encourage abstract and quantitative reasoning.	The teacher provides no or limited opportunities for practice and problem- solving related to key concepts (content strands), The exercises lack depth, and there is minimal encouragement for abstract and quantitative reasoning skills.	The teacher offers some opportunities for practice and problem-solving for key concepts (content strands), but there is room for improvement. The exercises are moderately engaging, and while there is an attempt to encourage abstract and quantitative reasoning, it may not be consistently integrated.	The teacher excels in providing ample and well- structured opportunities for practice and problem-solving related to key concepts (content strands). The exercises/activities are designed to encourage and develop abstract and quantitative reasoning skills, contributing significantly to students' proficiency in the subject.
15. The teacher concludes the mathematical problem by representing the concept through diagrams, two-way tables, graphs, flowcharts, and formulas and applying formative assessment strategies.	The teacher struggles to effectively conclude mathematical problems using visual representations and formulas. The use of diagrams, tables, graphs, flowcharts, and formulas is limited, and there is minimal evidence of formative assessment strategies.	The teacher makes some effort to conclude mathematical problems by incorporating visual representations and formulas. While there is moderate use of diagrams, tables, graphs, flowcharts, and formulas, the application of formative assessment strategies may be inconsistent.	The teacher excels in concluding mathematical problems by skilfully utilizing a variety of visual representations such as diagrams, two-way tables, graphs, flowcharts, and formulas. Formative assessment strategies are applied effectively, enhancing students' understanding and providing valuable feedback for ongoing learning.
Science Practices			

12. The teacher explains the fundamental concepts, principles, and interconnections of the life sciences, the physical sciences, the environmental sciences, and earth and space science using scientific terminologies.	The teacher demonstrates a clear understanding of the fundamental concepts across the various sciences.	The teacher effectively integrates relevant and meaningful examples and contextual references.	The teacher consistently and accurately employs scientific terminologies enhancing the precision and scientific rigor of their explanations.
13. The teacher uses strategies to engage students in scientific method of studies enabling students to develop solutions to problems through observation, reasoning and investigation.	The teacher cultivates curiosity among students by presenting scientific problem and issues from daily life.	The teacher selects and implements strategies that actively engage students in the scientific method consistently.	The teacher helps students developing their proficiency in solving daily life problems.
14. The teacher demonstrates principles and procedures related to the design and implementation of scientific investigations incorporating safety practices.	The teacher sensitized students about safety measures and hazards related to the activity.	The teacher adopted/ observed personal and students' safety measures during the activity.	The teacher guided students to practice all safety measures successfully during the activity.

15. The teacher fosters a deep understanding among learners about the intricate connections between science, technology, and society (STS connections) in present-day situations, emphasizing the effects of science and technology on society by cultivating STS connections in current contexts.	The teacher integrates STS connections in present-day situations and enhances students' learning by connecting the SLO with society & technology.	The teacher used technology i.e., AV aids like internet, computer, mobile, multimedia etc. during classroom instruction.	The teacher involved students by providing tangible gadgets/ IT equipment to boost their concepts.

Annexure III: Agenda for CPD-ESTs - Teachers' Professional Development Forum

Time	Session	Details		
Venue: District QAED Sharqpur Main Hall				
08:30 AM - 09:00 AM	Registration & Networking			
09:00 AM – 09:15 AM	*Opening Remarks*	Mr. Ghulam Farid Provincial Lead B-TAG		
09:15 AM – 09:30 AM	*Keynote speech*	Farhat Hussain Farooq Additional. Secretary, School Education Department		
09:30 AM – 09:45 AM	*Plenary Talk*	Mr. Tajammal Abbas Rana, Director General QAED, Punjab Ms. Naila Tayyab, Additional Director General QAED, Punjab		
09:45 AM - 10:45 AM	*Panel Discussion on the* Role of Communities of Practice in Teacher Development – Case study in Punjab	Panelists include Teachers, HT, Subject Experts, Provincial QAED representative, District QAED head (Ms. Naveeda Zia) Moderated by Dr. Shakeela Parveen, Deputy Director (Field) QAED		
10:45 AM - 11:15 AM	Q&A Session			
11:15 AM - 11:30 AM	Tea Break			
BREAK-OUT SESSIONS				
Venue	**Session**	**Details**		
		Training Room 1 English	**Training Room 2 Math**	**Training Room 3 Science**

11:30 AM - 12:30 PM	*Guest Session*	Reading Strategies Workshop – by Ms. Mussarat Shahid & Dr. Shahbaz Hameed	Mathematical Mindsets: Shifting Perspectives, Unlocking Potential – by Ms. Muneeza Junaid & Sohail Shahzad	How to inspire students to learn science concepts – By Muhammad Azhar Khan & Dr. Tariq Riaz
12:30 PM – 01:00 PM	Q&A session			
01:00 PM – 02:00 PM	Lunch & Prayer Break			
02:00 PM – 03:30 PM	*Round Table Knowledge Exchange* – Group Presentations	Implementation of English teaching strategies – Lessons from classroom practice	Implementation of Math teaching strategies – Lessons from classroom practice	Implementation of Science teaching strategies – Lessons from classroom practice
Venue: District QAED Sharaqpur Main Hall				
03:30 PM – 04:00 PM	Certificate Distribution Ceremony			
04:00 PM	Closing Remarks			