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3Mpower Evidence Café 1: Report

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Study abstract

3MPower will generate evidence on technology use for Teacher Professional Development (TPD) in low- and middle-income countries, with a particular focus on children's foundation numeracy skills in schools serving marginalised, low-income, rural communities.

3Mpower will study the use of numeracy TPD courses on Muktopaath - a government-led e-Learning platform used by over 400,000 teachers in Bangladesh - to answer the question "How are primary numeracy teachers using mobile learning for teacher development in rural schools and in what ways does this change learning and teaching?"

3MPower will generate evidence about the validity of every step linking teachers' use of mobile learning to improved student learning outcomes, through at-scale mixed methods research. 3MPower includes four process evaluation studies and two quasi-experimental impact evaluation studies with 240 teachers and 3,600 learners. Qualitative methods include Participatory Ethnographic Evaluation Research (PEER) exploring rural teachers' experiences of accessing CPD with technology and the practical application CPD to teaching and learning.

Throughout the research, 3MPower will engage a broad range of national stakeholders including government policymakers, policy implementers, teacher educators, rural education officers, and rural teachers. Stakeholders will participate in an iterative series of knowledge exchange activities, beginning with co-design and continuing throughout, through a series of Evidence Cafes. to make sense of the emerging evidence, refine the research approach, and identify implications and recommendations for policy and practice.

3MPower findings will address significant gaps in global evidence on the use of technology for teacher development in marginalised schools, the role of communities of practice, and the impacts at-scale on teaching quality and learning outcomes.

Introduction

The aims and objectives of the Evidence Café 1 held in October 2022 were to:

- Share and make sense of findings from Cycle 1 of research from Study 1A (Access), Study 1B (Relevance) and Study 1C (Communities of Practice).

- Confirm focus of Cycle 2 of research of Study 1A (Access), Study 1B (Relevance) and Study 1C (Communities of Practice).

The programme is set out at Annex 1.

Workshop Details

The Evidence Café was held at the Institute of Education and Research, Dhaka University, on Wednesday, 19th October, with 20 stakeholders from Directorate of Primary Education (DPE) at central and Upazila levels, Innovate for All (a2i), Bangladesh Rural Advancement Committee (BRAC); 5 PEER (Participatory Ethnographic Evaluation and Research) researchers; 6 Early Career Researchers and 4 members of the core research team.

A full list of participants is at Annex 2.

Summary of Sessions

1   Introduction to Evidence Café and Overview of 3Mpower

Participants were introduced to the Evidence Café aims and objectives (see above) and to the 3Mpower project.

2   Relevance of Anonde Gonit Shikih (Study 1B)

Progress was shared with participants as follows:

Initial reflections on content and pedagogy for learners

- Contents well-aligned with foundation numeracy skills.
- Modules include fun and engaging activities for learners.
- Well matched to curriculum with clearly signposted links to the textbook.

Areas for critical reflection include:

- **Relevancy** - how relevant is the activity to the intended learning outcomes?
- **Efficiency** - how efficient is the activity in creating opportunities to practice numeracy?
- **Practicality** - how practical is the activity, in terms of resources and class sizes in primary schools?

Initial reflections on content and pedagogy for teachers

- Some good links to research.
- Videos guide classroom activity.

Areas for critical reflection include:

- **The context** of classrooms and schools.
- **Classroom management**: class size, pair and group work, resources.
- **The role of others**, including peers and school leaders.

Participants then debated the way forward specifically, looking at if we have identified the most useful 'areas for critical reflection':

- **Relevance to learners' needs** - do we need a rapid 'baseline' of learners' foundation numeracy skills in rural schools, and which instruments should we use?
    - New sources of secondary evidence, e.g., latest National Student Assessment (NSA) data, were identified, subject to confirmation that these could specifically be linked to learners' foundation skills in rural schools.
- **Relevance to teachers' needs** - what are the big issues to address in the teachers' survey?
    - Key issues were to establish whether or not teachers accessed resources and used activities in class regularly, and whether the different elements of Anonde Gonit Shikhi made a difference to teachers' day-to-day practice.

3   Communities of Practice (Study 1C)

3.1   Introduction

The Evidence Café was introduced as a dialogue between policy makers, policy implementers, practitioners and academics that aims to bridge the gap between research, policy and practice. The purpose is to enable participants to make sense collectively of the research findings from Cycle 1 of the PEER research on Communities of Practice and to frame together the focus areas to explore in Cycle 2.

Key academic reference papers are at Annex 3.

3.2   Sharing of Findings

The research findings from Cycle 1 were presented by the PEER researchers under the following themes:

- Participation
- Anonde Gonit Shikhi
- Trust, relationships and commitment
- Distance and network issues
- Workload and teacher shortages

3.3   Discussion Object Tables

A table was set up for each of the above themes with discussion objects. The discussion objects were a number of 2-siders. Each research finding from that theme was recorded on a piece of paper, together with a 8-word summary, and, on the back, key evidences relating to that finding. Each table was facilitated by a PEER researcher and Early Career Researcher. Stakeholders could go to as many tables as they wished, so that they could see the evidence on which findings were based, ask questions of the PEER researcher and the Early Career Researcher, and debate the findings and their interpretation.

The discussion objects are at Annex 4.

3.4 Open Discussion – Known and Importance Quadrants

In plenary session, participants then debated:

- How new is this finding?
- How important is this finding, for teacher development?

The following quadrant analysis was drawn up:

↑		
Importance	• Networks worse at school, better at home • High workloads limit teachers' time for collaboration • Teacher shortages increase workload & decrease collaboration • School authorities may help improve sharing culture • Teachers in good relationship help each other • Teachers' discussions with colleagues depend upon trust • Sometimes poor relationships hamper collaboration	• Teachers rarely put activities into practice together • Teachers can face problems getting colleagues' help • Low confidence in professional knowledge hampers collaboration • Teachers want time from authorities for collaboration • Some teachers want authorities support for face-to-face
	• Teachers make efforts to mitigate effects of shortages • Help from online communities can be convenient • Journeys limit collaboration within and between schools	• Few teachers mentioned using specific Anonde Gonit Shikhi activities • In remote areas poor network hinders collaboration
	Known---Unknown	

3.5 Focus Research Areas for Cycle 2

Based on the open discussion, participants confirmed the following focus areas for Cycle 2:

1. Do you know any **teachers who are passionate about teaching numeracy skills, or who are concerned about children's learning** in numeracy? (If yes) can you tell me about any specific aspects of numeracy that excite or concern them, **and what they are doing** about that?

2. Do you know of any **teachers who have changed the way they teach and improved students' learning in numeracy**? (If yes) can you tell me all about their story?

3. Do you know any **teachers who are helping each other use the ideas and activities from Anonde Gonit Shiki in the classroom**? (If yes) Can you tell me all about their story?

4   Equity of Access (Study 1A)

4.1   Introduction

The intent and purpose of this second Evidence Café was confirmed as set at in section 3.1.

4.2   Sharing of Findings

The research findings from Cycle 1 were presented by the PEER researchers under the following themes:

- Physical access
- Cultural access
- Motivation and attitude
- Technology skill and use
- Anonde Gonit Shikhi

4.3   Discussion Objects

The discussion objects were a number of 2-siders. Each research finding from that theme was recorded on a piece of paper, together with a 8-word summary, and, on the back, key evidences relating to that finding.

The discussion objects are at Annex 5.

4.4   Open Discussion – Known and Importance Quadrants

In plenary session, participants debated:

- How new is this finding?
- How important is this finding, for teacher development?

The following quadrant analysis was drawn up:

The image is a 2x2 matrix with a vertical axis labeled "Importance" (with an upward arrow) and a horizontal axis labeled "Known---Unknown"

Top-left quadrant:
- Want developed knowledge and skills for better outcomes
- Most teacher get enough support to access
- Collaborations in important, so are recognition and respect
- Some practical constraints demotivate teachers
- Female teachers get less time using technology
- Some teachers feel need for ICT training
- Teachers have limited access to school laptops

Top-right quadrant:
- Learning new skills and certificates motivated teachers
- Not particularly concerned about improving mathematics learning
- Few teachers use specific teaching techniques in class
- Many know about AGS from head teachers, authorities, colleagues
- Most teachers use various platforms and websites professionally
- Unstable network limits completion of AGS course
- Family responsibilities limit female teachers' course access
- Age is not a barrier for the teachers (but limits access to training)

Bottom-left quadrant:
- Some teachers need technical help from others
- Teachers have devices but some face constraints
- Teachers mainly download and share educational contents
- Family support motivates teachers
- Some teachers have access to relative's laptops

4.5 Focus Research Areas for Cycle 2

Based on the open discussion, participants confirmed the following focus areas for Cycle 2:

1. Do you know any **teachers who have accessed Anonde Gonit Shikhi or even completed the course, but who didn't use Anonde Gonit Shiki activities in the classroom**? (If yes) Can you tell me all about their story and why they didn't use the activities in class?

2. Do you know any **teachers who have used the techniques and activities from Anonde Gonit Shiki in the classroom**? (If yes) Can you tell me about their story and whether or not they regularly used the activities with most learners?

3. Do you know any **teachers who cannot access AGS on the network at home or at school, but who were still able to see the videos and resources?** (If yes) How did they do that - can you tell me their story? (If no) If you did know a teacher in that situation, can you think of any way they could see the AGS video and resources, online or offline?

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Feedback and Closing

Positive feedback was obtained from participants, noting that it might have been even better if the café had been for two days.

It was confirmed that, in Cycle 2, each PEER researcher would collect 3 in-depth stories during November in respect of the identified focus areas for Study 1A (Access) and Study 1C (Communities of Practice) with an emphasis on numeracy and Anonde Gonit Shikhi. Upazila Education Officers endorsed these activities for Cycle 2. Participants expressed strong interest in participation in the next Evidence Café.

Feedback and Closing

ANNEXES

1) Final Version of Workshop Programme

Time	*Session focus*	*Facilitator(s)*
9.00	Welcome and formalities	Hafiz
9.15	**Study 1B:** RQ Is the content and pedagogy of Anonde Gonit Shikhi relevant to teachers' needs in terms of skills required to help students acquire foundational numeracy skills? • Progress Report • What do we want to know more about, to inform future decision making?	Siddique & Shifat
9.45	**PEER research: Communities of Practice (Study 1C)** a. Introduction	Tom & a2i EBC
	b. Sharing findings	PEERs (with ECRs)
	c. Discussion objects by table	1 ECR & 1 PEER per theme

	d. Open discussion
	      i. Quadrant analysis
	         1. How new is this finding?
	         2. How important is this finding, for teacher development?
	      ii. What do you want to know more about?
		a2i EBC & Tom

11.45	Break	
12.00	**PEER research: Access (Study 1A)** a. Introduction	Tom & a2i EBC
	b. Sharing findings	PEERs (with ECRs)
	c. Discussion objects by table	1 ECR & 1 PEER per theme

	d. Open discussion
	      i. Quadrant analysis
	         a. How new is this finding?
	         b. How important is this finding, for teacher development?
	      ii. What do you want to know more about?
		a2i EBC & Tom

1.50	**Feedback and closing**	Hafiz

2) Full List of Participants

Evidence Café 1 Participant List

Sl no	Name	Designation/Organization	Location
1	Md. Afzal Hossain Sarowar	Policy Specialist, a2i Program, ICT Division	Dhaka
2	Md. Mafizur Rahman	Researcher, National Curriculum and Textbook Board	Dhaka
3	Md. Shafiqul Islam Tipu	Senior Sector Specialist, BRAC Education Program	Dhaka
4	Mehedi Hasan	a2i, ICT Division	Dhaka
5	A K M Ruhul Amin	Assistant Specialist, NAPE	Mymensingh
6	Kaniz Fatema	Directorate of Primary Education	Dhaka
7	Mazeda Sultana	Directorate of Primary Education	Dhaka
8	S M Mahbub Alam	Directorate of Primary Education	Dhaka
9	Ismail Hossain	Directorate of Primary Education	Dhaka
10	Tuli Roy Chowdhury	Directorate of Primary Education	Dhaka
11	Tanjida Azad	Teacher	Dhormopasha
12	Sahadat Hossain	Teacher	Alikodom
13	Mimma Akter	Teacher	Mollahat
14	Amena Akter	Teacher	Nikli
15	Md. Abdul Hakim	Teacher	Roumari
16	Shuyeb Ahamed	Assistant Upazilla Education Officer	Mithamoin
17	Rajan Kumar Saha	Assistant Upazilla Education Officer	Dirai
18	A K M Zakir Hossain	Assistant Upazilla Education Officer	Chilmari
19	Shakil Ahmed	Assistant Upazilla Education Officer	Nikli
20	Md. Ashraful Islam	Upazilla Education Officer	Soronkhola
21	Md. Kamal Hossain	Upazilla Education Officer	Mollahat
22	Manobendro Das	Upazilla Education Officer	Dhormopasha
23	Md. Nazrul Islam	Upazilla Education Officer	Roumari
24	Mosabbir Hossain Khan	Upazilla Education Officer	Alikodom
25	Ashish Chiran	Upazilla Education Officer	Ruma
26	Debadas Halder	Associate Professor, Institute of Education and Research, University of Dhaka	Dhaka
27	Shah Shamim Ahmed	Associate Professor, Institute of Education and Research, University of Dhaka	Dhaka
28	Dr. Muhammed Mahbubur Rahman	Professor, Institute of Education and Research, University of Dhaka	Dhaka

3) Key Academic References

Clough, G., & Adams, A. (2017). Evidence Cafes: A How-To Guide [Report]. The Open University. https://oro.open.ac.uk/61637/

Clough, G., Adams, A., & Halford, E. (2017). A route to innovative training in practice based approaches. European Police Science and Research Bullletin: Special Conference Edition, 3, 115–122. https://oro.open.ac.uk/48469/

Clough, G. and Adams, A. (2020) 'Evidence Cafés: Overcoming conflicting motivations and timings'. Research for All, 4 (2), 220–41. http://oro.open.ac.uk/71172/

4) Study 1C: Discussion Objects

Some teachers get and provide professional help through online communities which they find convenient, quick & easy.

Help from online communities can be convenient.

To get professional help she uses helpline on the facebook (for primary school teachers). (Sarankhola-PEER2-T4)

They also have some groups from where they get instant help. She asks for help from that groups, and if anyone knows about the issue, they help her by giving her suggestion. (Nikli-PEER4-T5)

According to my participant's narration, he is a math teacher. He has a facebook group and a whatsapp group created by himself. In these groups he uploaded different mathematics notes & solutions, video recordings of his, shortcut techniques, teaching ideas etc. He added both students and some guardians in that group. There are also some teachers in his group. (Alikadam-PEER2-T4)

She mentioned that she helps other teachers too through these groups. (Mollahat-PEER1-T5)

She is also a "Shikkhok Batayon" member and has a profile where she uploads her content and asks for feedback. (Mithamoin-PEER1-T1)

They are also connected with different groups so that they know and learn new things, share their problems, and get instant help. (Nikli-PEER4-T3)

the Headteacher creates a messenger group where he gives updates on any official work, and the other teachers share some exciting or new things. (Nikli-PEER4-T3)

She thinks she can collaborate with them through the internet. It is not mandatory to talk face to face. They can collaborate via a messenger or whatsapp group which she does with her friend. (Alikadam-PEER3-T2)

Teachers face some problems in engaging communities of practice & in getting professional help, while some teachers don't think that they get enough help from local professional communities.

Teachers can face problems getting colleagues' help

The cause is not all of the teachers are interested in this & don't think using online platforms for professional development is useful enough. (Mollahat-PEER1-T3)

Moreover, there are no nearby schools in her area. If she needs instant help, she doesn't get it because no one doesn't want to take the trouble of the journey. (Mithamoin-PEER3-T5)

The school is located in a village. The distance of the school from her home is not so far. But if she wants help from the other school teacher then the distance have impact on that. She can't get help from the other school teacher easily. (Roumari-PEER4-T4)

My participant said the relationship among the teachers is not so good, not so bad. It is moderate. However, they all come from a long distance. That's why they have a few scope to discuss these techniques and collaborate with each other. Besides, other colleagues did not take any online course or ganit Olympiad training. So, they get each other for help informally when it is an emergency. (Ruma-PEER4-T5)

My participant shared that the head teacher in his school is not supportive, she does not appreciate if he applies new teaching techniques or digital devices. Moreover, the head teacher keeps the laptop to himself, so the teacher cannot use the laptop when he needs it. Her colleagues are also not cooperative. She does not seek help from them. (Dirai-PEER2-T5)

The other teachers become very busy for increasing the class load. If the teacher needs help, he does not get any teacher free to get help. For the shortage of teachers, the head teacher also takes classes often. If any teacher stay absent any day the problem multiplies that day. The teacher does not get any of the teachers that day to get help. (Roumari-PEER3-T3)

Teachers talked about participating in face-to-face groups within and across schools. They meet with teachers from their own schools more often. Face-to-face discussions depend on mutual relationships & trust. Some female teachers find it harder to participate in face-to-face discussions with male colleagues.

Teachers' discussions with colleagues depend upon trust

Yes, the teacher gets adequate help from her colleagues. Her colleagues help her manage the class because there are many students in each class. If her colleagues remain free, they go with her, sit behind the class, monitor the class to learn new things, and give her feedback. The Headteacher of her school sends other teachers into the class of one teacher to monitor their class for improvement.
(Nikli-PEER4-T1)

She discusses new ideas with other teachers, takes help in preparing teaching materials, operating computers & projectors. (Mollahat-PEER4-T3)

He says that when he goes to the village market, he sits with other teachers and shares their insights about new things and other school-related problems. Suppose they know the solution; they give him an idea of how he can solve the issues. When he stays in school, if he needs help, he connects with other teachers over a mobile phone and sometimes goes to a neighbour teacher who is an expert. (Mithamoin-PEER3-T4)

The area is a hilly tribal area, so the teacher has some challenges to make students understand an instruction or any content. The teachers then ask help from her colleague who is also a member of that ethnic community. The teacher is a member of 'Marma" but many of the students are from "Bawm". And the children do not know proper Bengali yet as they are very little kids. So, the teacher asks another teacher who is also from "Bawm' community how to explain any certain topic. That's how they are practicing together to enrich their professional skills. (Ruma-PEER3-T3)

My participant said that the teacher shares what she knows with the other two teachers so that they all become skilled in teaching. The teacher told the new colleague who is said to be weak at math teaching to observe her class and learn how she is teaching. My participant also told me that the teacher helps the colleague to understand the basics of simplifying, HCM, LCM and other mathematical problems. (Ruma-PEER3-T2)

Teachers need more scopes for face-to-face discussions. Some teachers felt head teachers and other authorities should organize times and spaces for this, with guidance from higher authorities.

Some teachers want authorities support for face-to-face.

The help is not enough. There are not enough needed devices in the school and also his personal. The school can manage needed device for the teachers. The teachers are not adroit enough to use ICT. They need training. And they need economical support. (Roumari-PEER3-T3)

The participant thinks there is a lot that the authority can do regarding this problem. At least 2 meetings can be organized for each cluster where teachers can share their problems & experiences. (Mollahat-PEER1-T1)

There is undoubtedly work to be done to encourage greater teacher sharing, as my participant informed me. Teachers might be inspired to practice together with the help of the Head Teacher and SMC. SMC ought to be more actively involved in enhancing teachers' effectiveness. They are already sharing their class breaks but if the school authority arranges a fixed meeting date inclusively for teacher's knowledge sharing it would be better. Another thing is when the teachers will observe that they are being provided with the cost of internet and other resources then teachers will be obliged to do so. (Alikadam-PEER3-T4)

Besides, they should be provided with sufficient resources and adequate time to do that. If the external issues like distance problem, network problem, workload problem are mitigated, and they are provided with regular training then it will be more effective. (Ruma-PEER4-T5)

Teachers most often experienced support from head-teacher and colleagues regarding the access of Anonde Gonit Shikhi course.

Peers and headteachers help teachers access AGS

The Headteacher supported him by providing a laptop and guidelines for doing the course. His colleagues also called him to know about his progress. The teacher added that they had made a "Study Circle" with the teachers of his Upazila who have done the course so that they can help each other teachers. He says that teachers in that circle also help each other to remind the previous techniques of the courses. (Nikli-PEER4-T4)

He was facing a problem logging in to the Muktopaath. His colleague helped him to show how he could log in to the course through the video call. He also faced problems completing a step because there was a test for each step, and he couldn't understand it. Then he asks for help from the messenger group, where many teachers have completed the course. The expert teachers then gave him suggestions on moving from one step to another. (Nikli-PEER4-T2)

Yes, she faces challenges in logging in to the Muktopaath because it's critical, and she cannot quickly enter the server. She says that when she was doing the course, most teachers didn't know about it, and it was a problem to get help in person. That's why she asked for help from online groups, and the teachers helped her by showing her how to log in to the course. (Nikli-PEER4-Study 1c-T1)

She said that she faced problems creating an account and logging in to the Muktopaath. Then she asked her colleagues help and they helped her to do that. When she applies the techniques sometimes, she faces some problems related to teaching-learning materials. Her colleagues try to help her to make them and sometimes they make the things for her. (Mithamoin-PEER 3-Study 1c-T5)

Teachers rarely talked about working together to put the activities or ideas from Anonde Gonit Shikhi into practice in the classroom. They gave many reasons such as having no knowledge of AGS course among colleagues, class workload, lack of resources, etc.

Teachers rarely put activities into practice together

The participant thinks that the help the teacher gets is almost nothing in proportion to what the teacher needs to develop her professional skills & implement them in her classes (Sarankhola-PEER3-T4)

When asked about whether the teachers receive enough support from their community or share teaching methods and ideas with other teachers many/ significant number of participants shared that the teachers do not receive enough help from the community. There are participants who reported that teacher do not discuss or share ideas to develop their profession due to many reasons such as lack of knowledge among other teachers, class load, lack of facilities etc.

The teacher does not take any help from her colleagues in applying new techniques in the classroom. There are only two teachers in his school. The head teacher is very aged and is not interested in applying new techniques in teaching. Moreover, her colleagues have not taken the online course, so they do not know much about implementing new techniques. Therefore, the teacher does not take help from her colleagues or share ideas with each other (Dhormopasha-PEER 4-T3)

My participant does not have much time for preparing for the classes. Besides, she has forgotten many of the techniques from the course. She does not even find anyone to help her because her other colleagues also have forgotten these. Besides, everyone remains busy with their workload, so they do not get scope to discuss or share ideas with each other. (Alikadam-PEER3-T5)

My participant shared they could not get a chance to apply his learning in the classroom immediately after completing the course. He has even forgotten some of the content. Besides this, he does not receive support from his colleagues or head teacher. So, he does not seek help from other teachers. There is no environment in the school to implement his learning. He said that he would be able to apply the strategies in his call if he got support from his colleagues, which he did not get (Dhormapasha-PEER4-T1)

There were only a few examples when teachers talked about working together to try specific techniques from Anonde Gonit Shikhi in the classroom.

Few teachers mentioned using specific AGS activities

A rare example of teachers working together which mentions specific examples of AGS activities or resources:

The teacher is female and young. She is very much interested in using internet for different purposes. My participant tries to conduct her classes with the techniques he has learned from the course. She has made colorful interactive teaching aids after completing "Anonde Gonit Shikhi" online course. My participant shared that the teacher gets help from her colleagues. If they get some break between classes, then her colleagues help her to prepare teaching aids. She uses marble, ball, ice cream sticks, balloons, sticky pad etc. for her math class. Her colleagues help her to collect and arrange these materials. They also share their teaching materials with to use in their classes. So that they do not have to take the pressure to make new materials every day. (Ruma-PEER3-T2)

When teachers talk about working together to apply AGS, they usually talk vaguely about 'preparing resources' but don't give any specifics of the AGS activity, the resources being prepared, or the numeracy topic being taught, for example:

Yes, she says from the course, she learns how to use teaching-learning material properly and how the materials can improve the students learning. Her colleagues help her make teaching-learning materials for her class if she doesn't have time or manage the materials. Sometimes the Headteacher gives her money to buy materials for making teaching-learning materials. She is not very expert in setting up an online class. Her colleagues help her prepare for the class and stay behind if they remain accessible at that time. The Headteacher also gives support by providing devices whenever she needs them. (Mithamoin-PEER 3-Study 1c-T3)

Many teachers have a good relationship with their colleagues and school authority. Whenever they face a challenge, they can seek help from their colleagues

Teachers in good relationship help each other

She says that there is a good relationship among the colleagues at her school. They try to help each other, and they have some barriers too. All of the teachers have class and workload and that's why they can't help others if they want to. But they share many educational things and help each other to learn many things. They help each other to make teaching aids and content. If anyone learns a new thing, they share it with others and they appreciate each other for their achievement. (Mithamoin-PEER 4-T3)

The relationship between them is very good. There is always mutual trust between them. They are very supportive. Every time they support each other. (Chilmari-PEER4-T2)

According to my participant, she believes that she has a good relationship with her colleagues. Whenever she faces any problem, she asks for help from her head teachers. Their head teacher is always ready to solve their problem. (Alikadam-PEER3-T1)

The teacher has a good relationship with all his colleagues. They share many of their problems including professional stuff. Sometimes they discuss together and propose a solution for a particular teaching problem. The participant said that all colleagues will help the teacher if he goes for help. (Alikadam-PEER T3-T4)

Sometimes teachers do not collaborate, not because of they do not have good bonding or mutual trust, rather because they are not accustomed to a sharing culture, or they cannot rely on their academic knowledge & expertise. They also do not get much time for their workload and other external issues.

Low confidence in professional knowledge hampers collaboration

The participant claimed that the teacher considers her coworkers to be good friends & shares her personal issues & events. They show respect for each other & there is good understanding between her & other teachers at the school. But the teacher doesn't really discuss matters related to professional development with her colleagues. The participant thinks that the teacher can't rely on the capabilities of her colleagues to get professional help. (Mollahat-PEER1-T3)

My participant told me that the overall relationship between the teacher and his colleagues is not bad. They are concerned about each other's wellbeing, daily matters etc. But they do not have the sharing culture in terms of professional development. They are just busy with taking classes, not concerned with improving teaching skills. (Alikadam-PEER3-T3)

My participant said that the teacher does not think he gets sufficient support from the school. Especially from the head teacher. The head teacher is indifferent to effective teaching strategies and his colleagues are all busy with more classes like him. So, they have no time to sit together and discuss things. (Ruma-PEER4-T1)

Most of the teachers of the school are not motivated. They like to take classes traditionally. So, there is a difference in the mentality of the teachers. (Sarankhola-PEER3-T3)

However, my participant said that the teacher has already tried to motivate his colleagues, but they are still not interested. (Alikadam-PEER3-T3)

A few participants also reported that the relationship among teachers is not so good that they could share everything without hesitation. Sometimes conflicts and envy arise among them, which hinders their professional collaboration.

Sometimes poor relationships hamper collaboration

She says that the relationship among her colleagues is not so good. Some teachers are relatives and take their family issues into the workplace, which causes a cold relationship among the colleagues. Sometimes any of the teachers take advantage of being the relative of another teacher, which is why the relationship between the teacher worsens. They don't rely on each other and always compete against others. (Nikli-PEER3-T3)

My participant shared that the teachers in his school are not cooperative. The head teacher does not encourage when the teacher applies new teaching techniques or digital devices in the classroom. So, he does not share ideas and teaching techniques with other teachers. (Dirai-PEER2-T5)

The participant informed that the teacher has good relations with some teachers but not with all of them. It creates many problems in getting help. He can't discuss anything with all of his colleagues. The situation creates mental pressure on him. Most of the teachers at the school are not motivated. They like to take classes traditionally. So, there is a difference in the mentality of the teachers. (Sarankhola-PEER3-T3)

My participant said that the teacher does not think he gets sufficient support from the school. Especially from the head teacher. The head teacher is indifferent to effective teaching strategies and his colleagues are all busy with more classes like him. So, they have no time to sit together and discuss things. (Ruma-PEER4-T1)

Head teachers and the members of the school managing committee may play a vital role to improve the sharing culture among the teachers. They can arrange regular meetings and provide all facilities to teachers so that teachers become motivated to share their teaching related ideas and experiences with their colleagues without any hesitation.

School authorities may help improve sharing culture

The teacher shared that they have enough trust in each other. However, to strengthen their trust among each other, the SMC committee may organize monthly teachers' meetings where instructors can express their ideas and discuss ways to enhance their teaching quality. (Dirai-PEER2-T4)

My participant teacher also thinks that the school authority is responsible to ensure whether the teachers are doing better. The head teacher might instruct the assistant teachers to apply modern pedagogy in their math classes and share their problems with each other. Then, probably the teachers would have tried to collaborate with each other. (Alikadam-PEER3-T3)

The head teacher can play an important role to improve mutual trust. He can arrange regular meetings to share the problems and opinions so that all the issues can be resolved. He can be a middleman. If the problem is big, they can take help from the outside. (Roumari-PEER3-T4)

The teacher says that the Headteacher of her school tries to sit with them every Thursday to listen about their problems and how they can do well in their work. If anyone has a problem, the Headteacher and other teachers try to solve the issue. They also maintain a school group where they share their thoughts and help one another. (Nikli-PEER3-T4)

If there is any problem the head teacher takes the role to solve the problem. She talks to the teacher personally to solve the problem. The teachers at that school are also cordial to solve if there is any problem between them. So, it is not a challenge to get needed help for the teacher. (Chilmari-PEER3-T5)

Teachers often spoke about network issues preventing them from using IT in class. But some used their phone at home, so network issues did not prevent them from seeking help from others. Some female teachers talked about facing issues using their mobiles at home even if they had a good network, because of time.

Networks worse at school, better at home

My participant reported that the teacher has a frequent network problem especially at her school. As long as she is in the school it is not possible to collaborate with others via phone because she has to take her classes and another reason is there is no network in that school. (Ruma-PEER3-T5)

The teacher says that she cannot download anything. It takes a whole day to download anything and creates a barrier to taking multimedia classes. She says that it takes too much time and that's why she can't manage time for her class. Sometimes the network connection in this area becomes so bad that they cannot connect with others or make a call. (Mithamoin-PEER 4-T3)

My participant teacher said to me that as long as she is in the school it is not possible to make phone calls and make enough time to collaborate with our ideas. Because during the school period every teacher is busy with his/her own classes. Besides, the cost of phone calls cannot be neglected. Although my participant said that internet calls are much cheaper, the problem is there is frequent load shedding. So, despite having wi-fi connection at the school, most of the time she cannot access the internet due to load shedding. (Alikadam-PEER4-T1)

She says she tries to pre-download the content as she knows what she'll teach in the next class. Most of the time, she does her online-related work at home. (Mithamoin-PEER 1- T5)

She lives in Sadar Upazila and has a broadband connection in her house. She doesn't face any network-related issues when she stays at home (Mithamoin-PEER 1-T5)

The Headteacher provides mobile data to the teachers to work at home and gives financial support also if needed. The Headteacher also allows them to take the laptop to do official work at home and discusses the issue with the authority. She is also waiting for the result. (Nikli-PEER4-T4)

But other teachers had problems using the network at home or at school. In some regions - especially Hoar, Hilly, Char - network issues had big effects on teachers, who could not access the internet at home or at school.

In remote areas poor network hinders collaboration.

It is a severe problem in the rural area. Sometime the load shedding continuous for a long time. In the season of storm, the electricity is not available for a long time. The phone cannot be charged. That's interrupt using mobile phone and internet (Roumari-PEER1-T1)

But the condition is not good for mobile and Wi-Fi network also. When the teachers talk over the phone the network fluctuates. Using internet by mobile network is almost impossible (Roumari-Peer4-T4)

The teacher says that she cannot download anything. It takes a whole day to download anything and creates a barrier to taking multimedia classes. She says that it takes too much time and that's why she can't manage time for her class. Sometimes the network connection in this area becomes so bad that they cannot connect with others or make a call. (Mithamoin-PEER 4-T3)

Most of the teacher said that geographic effects are notable in the Haor, Hilly & Char areas, making journeys to schools and between schools long, hard and slow. This limits teachers' ability to get help face-to-face from teachers in their own or from teachers in other schools.

Journeys limit collaboration within and between schools

The teacher said that the distance from her school affects her most in getting help because there are no nearby schools for her and cannot go to her school time. She added that she feels no interest in going alone to a school to get help from others. (Nikli-PEER3- T4)

If the teacher wants help from other schoolteachers the distance is a problem, he asks for help over the phone, but sometimes it isn't enough. When the problem is big then the person has to be present on the spot. (Roumari-Peer3-T5)

They live far from the school. My participant said that among the three teachers of the school two teachers live 12-14 kilometres away from the school while the third teacher's house is 5 kilometres away. After school, they all rush to their house. So, it is natural that they do not have time to collaborate after school. (Ruma-PEER3-T5)

The teacher lives in the Sadar area. The school is 16 km far from his house. Every day he has to change 2 to 3 vehicles for travelling to school. As a result, he cannot arrive at school on time. Eventually, the head teacher misbehaves with him for arriving late to school. So, he loses interest to go to other schools and do not get enough time to prepare teaching aid for teaching mathematic concepts. (DIRAI-PEER1-T5)

They live far from the school. My participant said that among the three teachers of the school two teachers live 12-14 kilometres away from the school while the third teacher's house is 5 kilometres away. After school, they all rush to their house. So, it is natural that they do not have time to collaborate after school. (Ruma-PEER3-T5)

Yes, she says there's a significant impact on getting help from others. The school is in a backward Haor area, and it takes much time to get any transport to home or any other school. There are no nearby schools also. That's why when she needs help, she can't go anywhere quickly. She tries to get help through her mobile phone, but it doesn't work consistently. (Nikli-PEER 3-T1)

Due to class and workload, many teachers do not get time to collaborate with others, which also impacts their teaching techniques, taking preparation for the class, physical-mental health, and getting help from other teachers.

High workloads limit teachers' time for collaboration

She has to take 6/7 classes per day. So, she does not get the time and feels exhausted after school. My participant also said, "We can not even take classes according to the routine. Suppose, the three teachers have entered three different grades to take certain classes. After the class, I have to move to another grade to take another class and my colleague has to come to my class for another subject which is the same that we are taking a class all the time. So, we generally do not move from the first class. We enter into a classroom and complete all the classes of this grade without changing teachers". (Alikadam-PEER3-T5)

He had not mentioned more, but there is a class load for him, and the consistent pressure of completing the syllabus sometimes demotivated him to take classes using various techniques. He also added that the time he gets after taking back-to-back classes is not enough to take those classes as there are many things to set up and don't get help. He also added that he doesn't get enough time to share anything with others. (Mithamoin-PEER4-T1)

Due to the class load, the teachers are always busy taking classes so if he needs any support, he cannot seek it from other teachers. Due to a lack of time, he cannot spend time watching videos or exploring the internet to improve his knowledge and skills. (DIRAI-PEER1-T2)

The teacher does not have much time to sit together with her colleagues. Her colleagues are also facing the same problem. If she has more time, then she can collaborate with other teachers more frequently. (Ruma-PEER3-T4)

He says there is a workload and the pressure of completing the syllabus, and it's impossible to take classes similarly. Sometimes he has to take the courses traditionally to complete the syllabus. If he wants to use online learning and teaching aid, it will take enough time (Nikli-PEER4-T2)

They do not have time. They feel very tired due to such a large number of classes. They do not have much time to sit together in the teachers' room. (Alikadam-PEER3-T5)

Several teachers try to solve their issues by taking many initiatives, but many teachers want authority support to solve the problems. Sometimes they get proper help, but sometimes they don't get help according to their needs.

Teachers want time from authorities for collaboration

She tries her best to plan her class before and arrange all the things. If she cannot manage everything, she asks for help from her colleagues, and if they have time to help, they help her unconditionally. The Headteacher also helps her by lessening her workload on that day when she tends to take online classes. The Headteacher also supplies teaching-learning materials and the cost of those things. The help of her colleagues and the effort of herself helps her to overcome these issues. (Mithamoin-PEER 4-T2)

The respected teacher along with the other teachers tries to solve the problem instantly. They rearrange the classes. They take extra classes sometimes. Sometimes they manage 2 classes at a time. (Chilmari-Peer3-T5)

My respondent said that the teacher needed enough time to prepare her class's supplies and lesson preparations. To have more free time, she also demanded fewer classes, but she was unable to do this on her own. (Ruma-PEER3-T3)

The teacher and her coworkers attempt an immediate solution by rearranging the schedule. However, it is not a long-term fix. To solve the issue, the authority should take action. To expand the number of classrooms and simultaneously hire more teachers, the school requires improved infrastructure. It will make it easier for the teachers to manage the large class. Authorities can hire part-time teachers to immediately reduce the number of students in each class. (Sarankhola-PEER4-T4)

Most of the participants reported that there are insufficient number of teachers in the schools. Moreover, some teachers are on leave for training or maternity purposes which increases their workload and limits their frequency of training & time to collaborate with other teachers for professional development.

Teacher shortages increase workload and decrease collaboration

As my participant said, the teacher has to go through excessive class load and administrative workload. There are 4 teachers in the school. Among them one teacher is on educational leave for her Diploma in Primary Education (DPEd) degree. So, there are actually 3 teachers working at the moment. Everyone has to take 7 classes on average. So. The teacher does not have much time to sit together with her colleagues. Her colleagues are also facing the same problem. Moreover, the post of the head teacher is vacant at this moment, that's why the teacher we are talking about is currently performing duties as a head teacher which requires a lot of time of her. She has to take her classes as well as perform official works. She has to remain busy all the time.

There is a teacher shortage in her school. There are five teachers and 600 students in the school, and it is pretty impossible to manage a large number of students. Her school teachers have back-to-back classes that don't give them enough opportunity to help others though they want to help colleagues. (Nikki-PEERT3-T4)

Due to a shortage of teachers, the teacher has to take 7-8 classes per day. She has to take classes one after one, there is no free time between the classes. This creates mental and physical pressure on another teacher. The teacher cannot prepare teaching aids or apply digital devices in all classes, eventually he cannot take classes effectively. The extra class load also creates mental and physical pressure on the teacher. (Dharmapasha-PEERT3-T4)

The participant said that in that school there are 6 teachers for 290+ students. One teacher is on leave. So the other teachers have to maintain the class schedule by taking extra pressure. The teacher has to take 7-8 classes in a day... He doesn't get time for preparation before the class. He can't discuss it with the other teachers or can't browse the internet either. So, it becomes hard for him to develop professionally. The other teachers remain busy with the workload too. So, if he needs any help, he doesn't get it. (Sarankhola-PEER3-T3)

Several participants noted that teachers are already making efforts to mitigate the effects of the teacher shortage by rearranging class schedules, combining two sessions into one, block-teaching, working later than usual, and employing some temporary teachers which they often called 'Para Teachers'.

Teachers make efforts to mitigate effects of shortages

The teachers try to solve the problem instantly by taking more than one class at a time. Sometimes they give activity to the absent teachers' class and at the same time maintain her own class. Sometimes they rearrange the class schedule. But the higher authority can take sustainable steps. (Chilmari-PEER3-T3)

The teacher alone can't solve the problem. The colleagues deal with the problem instantly by doing some instant actions like rearranging the routine, taking extra cases, taking two classes at a time, etc. (Sarankhola-PEER4-T3)

Using her pre-planned schedule, her class would go as scheduled. She might collaborate with other teachers after the school or at the time of day-off. (Alikadam-PEER4-T5)

But for now, they are trying to solve the issue by appointing a "Para Teacher" to reduce their work and class load. (Mithamoin-PEER 3-T5)

In this case, the SMC and the school authority can use the fund and recruit unemployed graduates of their Upazila as temporary para teachers in order to use the class load. (Dhormopasha-PEER3-T4)

She also suggested that the local authority & school management committee can arrange para-teachers (temporary) from the community to decrease the workload of the teachers of her school including her. (Mollahat-PEER1-T4)

But because of the school's location, no teachers want to stay in this school. Though in every recruitment process, they give new teachers, they do not stay here and show political power to move from the school. That's why they are trying to recruit local teachers so that they stay here and do not move. They have suggested the MoPME create new posts and appoint new teachers for the school. (Mithamoin-PEER 3-T5)

My participant reported to me that the teacher thinks the Govt. only can solve this problem by recruiting local teachers in that hilly area. (Ruma-PEER4-T2)

5) Study 1A: Discussion Objects

1A: Physical Access

Almost all teachers have their own smartphone. Some teachers' use of mobile phones for professional development is limited by network issues or data costs.

1A: Physical Access

Teachers have devices but some face constraints

1A: Physical Access

She has a smartphone, and she uses mobile data and buys a monthly package; sometimes, she has to buy it twice a month. There is no wifi connection in her locality or her school. In her school, there is a router that has a sim connection. The headteacher buys a data pack for that sim, and the teachers use it for an online class or other official work purposes. (Mithamoin-PEER2-Study 1a-T3)

When I asked my participant to talk about a teacher who has mobile devices. My participant talked about one of his colleagues who has a smartphone of his own. (Ruma-PEER2-T1)

She knows a teacher very well who owns a smartphone. (DIRAI- PEER2-T5)

The participant said that the teacher has a personal smartphone which she uses for her personal & professional needs. (Sarankhola-PEER2-T1)

The network condition is not good in her area which surely affects the teacher's attempts to access the internet & get help from online sources. (Sarankhola-PEER2-T2)

The network speed is very weak. It makes the experience of accessing mobile phone and internet in the home worse because the area is village area. (Chilmari-PEER2-T5)

However, the internet connection in that area is very low majority of the time. When she watches a video or downloads content from the internet, it keeps buffering and takes a long time to download. (Dhormopasha-PEER4-T3)

However, the problem is the internet speed is not good all the time, especially when it is raining. Another problem she mentioned is that she can access the internet when she is in her room. (Ruma-PEER1-T2)

In their area there is no Wi-Fi connection. They use mobile data for internet usage. However, the internet connection is very low. It takes a lot of time to get internet connection. (DIRAI-PEER2-T3)

The teacher has no wi-fi connection at his home as well. So, he has no other option than depending on mobile data. (Ruma-PEER2-T1)

There is no Wi-Fi or broadband internet connection in his home. So he uses mobile data in the home. (Chilmari-PEER2-T5)

The network condition is good as her home is in town area. (Sarankhola-PEER2-T1)

1A: Physical Access

Some teachers have access to laptops at home but those are often owned and used by other family members.

1A: Physical Access

Some teachers have access to relative's laptops

1A: Physical Access

Her husband has a laptop. So, the teacher has access to both devices, a smartphone and a laptop. But her husband uses the laptop most of the time for his official work. She can have access at night or when her husband is not working with this laptop. (Ruma-PEER1-T4)

She informed that the teacher doesn't have any other personal device, but her husband has a laptop. (Sarankhola-PEER2-T4)

Other family member have device but she only use her device when needed. (Chilmari-PEER1-T5)

He has no laptop or desktop. (Ruma-PEER2-T1)

The teacher does not own a laptop. (DIRAI- PEER2-T5)

The participant said that the teacher doesn't have a laptop, tablet or an ipad. (Sarankhola-PEER2-T1)

No, the teacher has no laptop or other devices of his own. (Nikli-PEER 2-T5)

He has no other devices in his home. (Roumari-PEER1-T3)

Some teachers had laptops of their own:
My participant teacher talked about one of his colleagues who has a smartphone and a laptop. (Ruma-PEER1-T1)

The teacher had a laptop. She has her personal laptop. (Dharmapasha-PEER1-T2)

1A: Physical Access

Very few teachers use school laptops for their professional development. Teachers have limited access to laptops in schools and network coverage is often worse in school.

1A: Physical Access

Teachers have limited access to school laptops

1A: Physical Access

But she doesn't use it as she gets very little free time at school. Actually, no teacher of the school uses the school laptop for any personal or professional purpose. It is only used for the school's official works. (Mollahat-PEER2-T5)

There is a laptop at his school but at present it is damaged, and no one even does not feel the need to repair it. At this moment the laptop is locked in the head teacher's locker. (Ruma-PEER2-T1)

There is a laptop in her school, but she doesn't use it much. The reason for her not using it is actually because there's a huge class load on the teachers of her school including her & she gets a little free time there to use laptops for any reason. Actually, the laptop is used only for official data entry. (Mollahat-PEER2-T4)

There is a laptop in her school, but now the laptop is dead, and she can not use it now though she needs one. (Nikli-PEER2-T1)

She doesn't use that laptop. Only the head teacher uses that. (Sarankhola-PEER1-T1)

My participant said that she doesn't get the chance of using the laptop in the school. The laptop is used to do the official works of the school only. (Mollahat-PEER3-T1)

In the first conversation my participant was talking about the teacher who might have communicated with other teachers over phone or online platform. I asked today to say whether the teacher faces any challenges due to his network condition. From the narration of my participant, I came to know that the teacher's school is out of network. There is no wi-fi connection. Mobile network is not available there. The teacher can not use the internet or make any calls from his school. The other teachers of this school also face the same problem. (Alikadam-PEER3-T3)

1A: Cultural Access

Both men and women have to do different types of work in the family. In some instances, however, female teachers have more responsibilities at home than male teachers due to domestic responsibilities such as housework and childcare. But now they are taking more initiatives for professional development.

1A: Cultural Access

Female teachers get less time using technology

1A: Cultural Access

As a female, she faces some issues: she has to give enough time to her family members, and her children are too small to take special care of them. Moreover, she can not get her phone because of the maximum time she remains engaged with her children at home. She can not manage time when she stays at the house because there is a lot of household work (Nikli-PEER 2-T5).

My participant said that the teacher does not get enough time to use her phone or laptop when she is at home, which a male can easily. She is married. She does household chores after school (Ruma-PEER1-T2).

She thinks she has rather a gender influence on her access to using the digital devices. The teacher is a female. She has to work a lot for her family and babies. She gets tired after doing all the household stuff. So, she thinks she has less time than her husband and other male colleagues. She said that she has more workload at home (Ruma-PEER1-T4).

The teacher is a female and married. She had used a smartphone. She also had an account on Facebook. But some misunderstanding occurred between her and her husband using social media. My participant does not know what actually happened, but she is sure that the teacher is forbidden to use a smartphone because of that incident. The husband of the teacher does not allow the teacher to use a smart device (Alikadam-PEER1-T3).

She had not had a smartphone before because of being a woman. Her husband didn't allow her to use a mobile phone. But in the Covid situation, it was mandatory to buy a smartphone to take online classes and connect with other officials. There was also an arrangement for a meeting. So, her husband allowed him to buy a smartphone. But she can not use the phone whenever she wants (Mithamoin-PEER 2-T4).

1A: Cultural Access

The support of family members is important in enabling teachers' access, but they have different experiences. Most of the teachers get enough support from their family members which motivates them to use technology.

1A: Cultural Access

Family support motivates teachers

1A: Cultural Access

The teacher told my participant that he and the female members of his family get equal access to these devices. They share their work so that no one is overburdened with family work. The teacher also cares for his babies parallelly with his wife. So, the teacher thinks he or his wife none has any gender issues with using devices. (Ruma-PEER1-T5)

The participant stated that the instructor doesn't have a family problem because she has helping hands at her home to look after her children & take care of domestic chores. Additionally, her husband supports her in solving any issues. (Sarankhola-PEER1-T3)

She says there are android phones for her family members, and they have their phones. Her family members don't bother her when she uses her mobile phone. (Nikli-PEER1-T5)

Her parents did not allow her to use any kind of phone because they doubted that their daughter might communicate again with her ex-husband or with her baby. For this reason, my participant was deprived of using a mobile phone for a long time. But now, she is using her smartphone because our Upazila Education Officer has created a messenger group where he sends important notifications. Now, her parents do not forbid her because many days have passed after her divorce. (Alikadam-PEER2-T5)

She says there are android phones for her family members, and they have their phones. Her family members don't bother her when she uses her mobile phone. Moreover, her children support her with various things on her mobile phone. (Nikli-PEER 1-T5)

1A: Cultural Access

Age isn't an important factor for the teachers to use technology, but the young teachers are really very enthusiastic to learn and use technology in their regular use. But in few cases the aged teachers face mental and physical issues which influence their access to technology.

1A: Cultural Access

Age is not a barrier for the teachers

1A: Cultural Access

There is a teacher who uses different devices. Despite his age of 40+, he is keen on using smartphones and these have accelerated his professional development. He also takes online classes and opens a page to teach different topics to the students and students are also benefitted from this. (Dirai-PEER2-T2)

The participant replied the teacher thinks no, age doesn't have any factor on access to mobile and internet. She thinks interest is present in every aged person. (Roumari-PEER1-T4)

According to her, many of her older colleagues are also interested in using mobile phones, she says from her experience. She said that she has a colleague who is a bit older, and his eyesight is not that sharp, but he used glasses and with the help of his colleagues she used the mobile phone. (Dirai-PEER1-T1)

My participant shared that the teacher is 40 years old, interested in exploring the internet, and watches cartoons on her mobile phone. She likes to spend time on her phone. When she does not understand a topic or find any information, she searches for it on Google. So, there is no impact of his age on her access to digital devices. (Dharmopasha-PEER3-T5)

The young teachers have such interest that they solve the problem and ensure her access by any means, and they give their effort for their professional development. (Roumari-PEER1-T4)

 She is a young teacher. She thinks as young teachers, are welcoming and can quickly learn new things. It is very hard for some older teachers to cope with modern technology, though there are some exceptions. (Dharmapasha-PEER4-T1)

He is very old, and his job is almost in the last stage. Therefore, he is not very skilled in using mobile phones or devices. He thinks that it's not necessary to learn new things the last time and feels pressure. (Mithamoin-PEER 1-T2)

1A: Cultural Access

Family and religious values, socio-economic status and the authority support plays an important role for using technology. Most of the teachers have a positive impact in these cases and get enough support.

1A: Cultural Access

Most teachers get enough support to access

1A: Cultural Access

The Headteacher of her school is aged, but he is enthusiastic. He can not use or understand things easily but inspires other teachers and allows them to learn and use technology in school and class effectively. There are network and electricity issues in the school; the Headteacher is trying to solve the problems with the help of SMC members and the Upazila Education Office. Moreover, he offers mobile data to the teachers if they want. She says she gets enough support from the school. (Nikli-PEER 1-T2)

My participant shared religious or social values do not hamper the teacher's access. In their community majority of people own smartphones so religious views do not hamper their usage. (Dirai-PEER1-T3)

The participant doesn't think that the teacher faces any social barrier in this. He informed me that the teacher is a respected woman in her community & her society recognizes her as a good teacher. There are no financial issues for her either in her access to the internet. (Sarankhola-PEER2-T2)

My participant says his family condition is good enough, so he has no socioeconomic barriers. He is also a service holder and can spend his money willingly (Nikli-PEER 2- T3)

Our interviewee talked about herself. She said that she wanted to buy a better phone, but she could not because of economic factors. She also said that she could learn better if she could afford a laptop or at least a better-quality smartphone. It would also save her time. She would not have to go to another teacher's home to complete assignments for her DPEd program. (Dharmapasha-PEER1-T2)

1A: Motivation and Attitude

Motivated teachers talk about their aspirations - to improve their own knowledge and skills, to make teaching and learning more enjoyable, and to raise students' learning outcomes.

1A: Motivation and Attitude

Want developed knowledge & skills for better outcomes

1A: Motivation and Attitude

She thinks that better outcomes can be attained if teachers have access to online resources & try to develop professionally by taking help from them. (Mollahat-PEER2-T4)

She noticed that the students enjoy learning new things through new ways. That motivates her most to use mobile and the internet for PD. (Chilmari-PEER2-T4)

The joy and interest of the students motivates the teacher more to get new information and learning new technics from the online. (Roumari-PEER3-T3)

The children also enjoy the class when they see their teacher is teaching them in an interactive way. (Ruma-PEER1-T3)

The participant thinks that she can learn new things & techniques continuously regarding her professional field from online sources. (Mollahat-PEER3-T4)

Learning new techniques of teaching motivates her most. (Chilmari-PEER1-T2)

Therefore, much information is found from online that is not in the book. (Nikli-PEER2-T3)

Actually, from these apps and sites a teacher can learn anything without asking others. So the teacher uses these if she faces any problem with any content. So, the teachers use these sites to improve her skills. (Ruma-PEER1-T4)
The teacher takes access to the internet as an opportunity to access a lot of info, knowledge & techniques related to teaching & other fields as well. (Sarankhola-PEER2-T2)

She enjoys integrating new teaching ideas in her lessons as it makes the lesson easy for the students to learn & it brings better outcome from her teaching-learning sessions which makes her feel good. (Mollahat-PEER4-T1)

1A: Motivation and Attitude

Motivated teachers also talk about the importance of collaboration with other teachers and being recognized and respected by their peers and school authorities.

1A: Motivation and Attitude

Collaboration is important, so are recognition & respect

1A: Motivation and Attitude

The recognition she gets from her colleagues, community & authority for her teaching & ICT skill motivates her to learn more & for that online sources are easy & rich options. She is respected among the community, praised by the authority & loved by her students which she enjoys much & she wants to keep it unharmed. That is another reason for her continuous development attempts & for that, she thinks taking helps from online sources is a must. (Sarankhola-PEER2-T2)

She said that everyone, including her headteacher and colleagues, motivates her and is proud of her because she is very energetic and wants to learn new things. They encourage her to learn new things and ask her to share the items with them. Her students also love her because of her teaching style, and that's why she is motivated to use technology for professional development. (Mithamoin-PEER1-T3)

Yes, the headteacher of his school is very active and allows every school teacher to use a mobile phone when needed. The managing committee of this school is also very supportive to the teachers, and the committee gives an amount to buy mobile data for school purposes. (Mithamoin-PEER1-T2)

Her family and school environment motivate her mainly to work for her professional development. Her colleagues feel proud of her and are inspired by her also. (Mithamoin-PEER1-T5)

1A: Motivation and Attitude

Motivated teachers did not talk about the need to improve teaching and learning in mathematics or numeracy in particular. (Talked about in general improvement of the students but not particularly in Mathematics).

1A: Motivation and Attitude

Not particularly concerned about improving Mathematics learning

1A: Motivation and Attitude

Actually she said that she always feels a motivation to update her knowledge & skills to prove herself an enthusiastic and modern teacher. She does not want to lag behind. To improve her professional development, she is always active and concerned for technology. She also said that she always tries to keep her skills more advanced than her other colleagues. (Ruma-PEER1-T3)

The participant thinks that she can learn new things & techniques continuously regarding her professional field from online sources. (Mollahat-PEER3-T4)

Learning new techniques of teaching motivates her most. (Chilmari-PEER1-T2)

He says the teacher is very young and dedicated to his profession and continuously tries for professional development, which is why he does a lot of work. (Nikli-PEER1-T3)

The teacher wants to be professionally self-sufficient & tries continuously to develop her teaching skills. (Sarankhola-PEER2-T4) She says that as a teacher, she has responsibilities to teach the students, and it's essential to remain updated with the new techniques and modes. (Nikli-PEER2-T5)

Actually, from these apps and sites a teacher can learn anything without asking others. So the teacher uses these if she faces any problem with any content. So, the teachers use these sites to improve her skills. (Ruma-PEER1-T4)

1A: Motivation and Attitude

Teachers said they were demotivated by practical constraints - such as IT skills, time, network issues, or an unsupportive school environment.

1A: Motivation and Attitude

Some practical constraints demotivate teachers

1A: Motivation and Attitude

She doesn't think taking helps from online sources can help much. She doesn't have enough time to access the internet for her professional development because of many problems. So, she can't explore it either. Moreover, she has some skill issues too. She said that she doesn't have much time to access internet for professional purposes. She has some time while in school but can't access to internet there as there's no internet connection in the school & the network condition is not good in that area.

The participant told me that the teacher doesn't think that most of the ideas gotten from the online sources are applicable in real life & there's not enough time for that too. So, she doesn't feel motivated to learn something new for her professional development. (Mollahat-PEER2-T5)

My participant mentioned weak internet connection also demotivates teachers to use digital devices for their professional development. (Dirai-PEER2-T3)

My participant mentioned weak internet connection also demotivates teachers to use digital devices for their professional development. (Dirai-PEER2-T3)

The teacher argues that "Why should we buy mobile data with our own money?" He is even not willing to spend his own money for learning or zoom meetings or any other academic purpose. During Covid-19 pandemic he had to spend his money to buy mobile data for online classes and still he is disturbed about that. (Alikadam-PEER2-T1)

She said about less efficiency to ICT knowledge. Sometimes she doesn't know how to search some complexed things. Sometime the lake of ICT knowledge demotivates her. (Chilmari-PEER1-T3)

Load shedding happens frequently and at the time of load shedding it does not work. (Ruma-PEER1-T4)

1A: Tech Skill & Use

Majority of the participants reported that teachers use Facebook, Messenger, WhatsApp, YouTube, Google, Gmail, Google meet, Zoom, teachers.gov.bd, muktopaath.gov.bd, nctb.gov.bd, ipemis.dpe.gov.bd, 10minuteschool, dictionary, NCTB books most frequently in their professional life.

1A: Tech Skill & Use

Most teachers use various platforms & websites professionally

1A: Tech Skill & Use

When he is confused about a concept or needs a piece of information he searches it on Google, he also downloads pictures, and charts related to his teaching content from Google. He watches videos explaining mathematics concepts, class teaching, and making teaching aid ideas on YouTube and follows them to improve his teaching skills. He uses Google Drive to store, and share documents, and files with teachers, and head teachers. UEO, AUEO share the important documents and link with them on Google drive. (Dhormopasha-PEER4-T5)

He uses Facebook, Messenger, and What's app to communicate with others and to remain connected with the newest information. He is a member of several teachers' groups of his Upazila and others where the teachers share essential information and their experiences. He also uses YouTube to watch videos for entertainment and educational purposes. (Nikli-PEER 2-T3)

My participant reported that she saw the teacher using facebook, instagram, whatsapp and messenger for social interaction. The teacher also visits youtube channels almost everyday. To know something new she searches on google. (Ruma-PEER1-T2)

For professional purposes, he uses facebook groups, he is a member of almost every big facebook group for primary teachers. He is also in the messenger groups for teachers of his Upazila, cluster & his own school. He watches videos of other teachers sometimes on facebook & youtube. (Sarankhola-PEER1-T5)
He uses zoom and google meet to attend any online meeting of the Upazila Education Office. He conducted online class through google meet during the pandemic. (Alikadam-PEER2-T4)

The teacher also visits various educational websites, blogs and apps such as 'Shikho' app, Muktopaath, NCTB, Shikkhok Batayon (teachers.gov.bd) etc. (Ruma-PEER1-T1)

She watches videos related to contents, related to teaching techniques from YouTube, she watches videos related to mathematics from Shikkhok Batayon to develop skills. (Chilmari-PEER2-T2)

1A: Tech Skill & Use

According to most of the participants, teachers use platforms & websites mainly for downloading and sharing educational contents, images or videos. They use Google meet and zoom to conduct online classes or to join official meetings.

1A: Tech Skill & Use

Teachers mainly download & share educational contents

1A: Tech Skill & Use

My participant says the teacher uses these devices regularly for her professional development. The teacher is responsible for handling the pre-primary section in the morning shift. There she uses different rhymes and animations to teach the children. She gets these videos from YouTube and downloads them on her phone. In the classroom she uses smart TV connecting with her phone and shows the rhymes and animation videos to the children. She also downloads PowerPoint content of math lessons from Shikkhok Batayon (teachers.gov.bd). Besides, she watches some YouTube channels like Muktopaath, 10minuteschool for various teaching ideas. She can host a zoom class. She searches images on google of different geometric shapes and downloads them. (Ruma-PEER1-T2)

He has WhatsApp group, messenger group where he and other teachers exchange teaching-related information, teaching aid ideas, class videos, their experience, and official information. (Dhormopasha-PEER3-T3)

She uses social media to upload photos and videos of education. She likes to share her activity on social media and in different groups. There are other groups of teachers of her Upazila and across Bangladesh. She maintains a connection with them using the groups. She says it's very helpful to get help from other teachers across the country through social media. (Mithamoin-PEER 2-T5)

He has a facebook group and a whatsapp group created by himself. In these groups he uploaded different mathematics notes & solutions, video recordings of his, shortcut techniques, teaching ideas etc. He added both students and some guardians in that group. There are also some teachers in his group. (Alikadam-PEER2-T4)

1A: Tech Skill & Use

Although most of the participants reported teachers have basic skill like downloading or uploading educational contents, still there are a number of teachers struggle while using technology and ask for technical help from their colleagues, head teachers, family members & some social platforms.

1A: Tech Skill & Use

Some teachers need technical help from others

1A: Tech Skill & Use

My participant told me about a colleague who does not understand the basic function of a smartphone. For example, if the teacher needs to change any setting of the phone or to send an email, he just asks another colleague to do this for him. His colleague then helps him. The teacher also comes to my participant for help. (Ruma-PEER2-T2)

He takes help. Usually, he asks help from his colleagues, and he gets help from the colleagues. They are not IT specialists, but they help him by consulting between them. Sometime they pass new information to him, sometime they help him by solution of some small problems like data problems (Roumari-PEER3-T5)

According to the participant, the teacher takes help from only one teacher who is skilled in ICT operations (Mollahat-PEER4-T1)

But there are some technical issues like the device's problem, and he gets help from his colleagues to solve this problem. (Mithamoin-PEER -T1)

The teacher took a lot of help from other teachers as she is not skilled in basic online operations. She took help in registration, log-in process & submitting answers. (Mollahat-PEER3-T1)

In the beginning she faced challenges in downloading YouTube videos, where to find those videos. When she faces difficulties in using these software, she seeks help from her colleagues who are skilled in using technology. Eventually, overcome those challenges with the help of her colleague who is an expert. (Dhormopasha-PEER 4-T3)

If the teacher faces any challenge to understand any function of these devices, her husband or her son helps her. (Alikadam-PEER2-T3)

1A: Tech Skill & Us

As a number of participants mentioned that teachers often face problems in using technology, hence they feel a need for ICT and relevant training to improve teachers' technical skills.

1A: Tech Skill & Use

Some teachers feel need for ICT training

1A: Tech Skill & Use

The participant mentioned that she can't do everything she needs to as she lacks basic ICT skills. In the last couple of years, she learned a lot but still can't use a computer comfortably. She feels that every teacher should be given the chance of ICT training. (Mollahat-PEER T3-T4)

She also stated that because she does not know how to use educational apps or information and is not very skilled, she believes a training program for beginners should be established by authorities to assist her learning. (Nikli-PEER2-T2)

The main problem she faces is about the lack of knowledge of ICT. If she could get training to use the new devices, she could have used the online knowledge properly. They also said she doesn't get information about training. If she had information about training at least, she should take part by her interest. (Roumari-PEER4-T4)

My participant narrated that the teacher is very interested in technology. At first the teacher did not know how to operate a computer but after receiving ICT training, she seemed to be more interested in these. (Alikadam-PEER1-T4)

The participant has training in ICT, so she didn't have to face any technical problems. She completed the course quite easily. (Mollahat-PEER2-T4)

She also downloads various content from teachers.gov.bd. The teacher has also received ICT training in 2018, after the training she also created some digital contents and uploaded these on a facebook page. (Ruma-PEER1-T1)

1A: Anonde Gonit Shikhi

Most teachers have learned about AGS from their head teacher, education officers and colleagues via social media. There are very few teachers who had not heard of Anonde Gonit Shikhi.

1A: Anonde Gonit Shikhi

Many know about AGS from headteachers, authorities, colleagues

1A: Anonde Gonit Shikhi

My participant said that the teacher completed the course during the lockdown. That time the school was closed. The teachers heard about the course from his head teacher. The head teacher instructed him to do the course and show him the certificate. Then the teacher communicates with another teacher who have received his certificate to know the details about the course (Alikadam-PEER3-T3)

The participant previously mentioned that the teacher had learned about the course via her school's headteacher. She was suggested to enroll in and complete the course by the headteacher, as the UEO suggested two teachers from each school to do so. (Sarankhola-PEER1-T3)

The head teacher also told him to do the course for professional development. The head teacher not only gave the information but also helped economically. He gave the money of buying data. His family helped him by managing time. (Roumari-Peer3-T3)

During the lockdown when their head teacher called him and informed them that he has to complete the course, he immediately finished the course. In fact, he is the first assistant teacher in his school who has completed the course. After finishing the course, he encouraged other colleagues to finish it quickly. (Alikadam-PEER2-T4)

The teacher has finished the Anonde Gonit Shikhi course on the Muktopath platform, according to my participant. He learned about that course from the Education Office. The education office sent out an email with instructions to complete the course and submit the certificate to their location. (DhormopashaA-PEER3-T4)

My participant shared that the teacher has completed the Anonde Gonit Shikhi course on the Muktopath platform. He came to know about this course through Facebook, and Messenger groups where other teachers have shared their certificates. (Dhormopasha-PEERT4-T1)

1A: Anonde Gonit Shikhi

The teachers who have completed the course talked about having learned of effective teaching techniques. Some teachers have mentioned about using the techniques in the classroom. However, very few teachers mentioned about any specific techniques they had learned or activities they had used.

1A: Anonde Gonit Shikhi

Few teachers use specific teaching techniques in class

1A: Anonde Gonit Shikhi

A few teachers mention specifics:

She is very interested in using the learning in the class and tries to do it. She uses different concrete teaching materials to give a clear idea to students. The teacher says she tries to involve the students in active learning so they can learn independently. She uses "Jogjontro." "Measurement scale" for teaching them addition and measurement. The students become happy when they make their materials and use them for learning. (Mithamoin-PEER 1-T3)

Yes, he tries his best to use the learning in class. For example, he says he uses pieces of paper to teach multiplication called "Namotar Haddi" which he learned from the course. It's an easy way to teach multiplication than a traditional method. Students in his class enjoy this method very much and know a thing in a very short time. (Mithamoin-PEER 1-Study 1a-T2)

Much more often references are generic:

The teacher says she is interested in applying her learning in the classes, but the class size is very big which causes difficulties in applying the techniques successfully in the classroom. Otherwise, she uses different teaching aids, techniques and digital content to teach her students a lesson (Nikli-PEER4-Study 1C-T5)

She says she is comfortable traditionally taking classes. But sometimes she tries to combine new things such as: changing the techniques, involving the students in activities etc. But she doesn't do it regularly because she has pressure to complete the syllabus and other official work. But she thinks that the course effectively teaches math in a new way and also thinks that to apply these techniques needs extra class time. 40/45 minutes class time is not enough to successfully execute these techniques. Moreover, teacher's work load should be decreased so that the teachers can concentrate on teaching (Mithamoin-PEER2-Study 1a-T3)
The participants shared that the teacher have learned new teaching techniques and new content ideas from that course (Mollahat-PEER4-T5)

1A: Anonde Gonit Shikhi

Majority of the teachers, who have shared about network issue, said that prevented them in completing the Anonde Gonit Shikhi course.

1A: Anonde Gonit Shikhi

Unstable network limits completion of AGS course

1A: Anonde Gonit Shikhi

My participant shared that he knows many teachers who have not completed the course. He knows a teacher who has started the course but due to network issues, he had to do the same quizzes many times. Moreover, the course was very time-consuming and long so the teacher could not complete the course eventually (Dirai-PEER2-T2)

My participant said that the teacher could not take the course during the lockdown because of network problems. The hilly area is with low internet coverage, so it is very common to have frequent network issues. So, my participant could not complete the course. (Ruma-PEER4-T4)

She knows the teacher was facing problems because of the server. She says the server of Muktopaath is very slow and takes much time to load, and sometimes it doesn't work for a long time, which is why some of the teachers were facing problems completing the course. (Nikli-PEER2- T5)

The teacher says that the server of Muktopaath was very weak and couldn't do the course sitting in her house. She had to go outside of her home where the network was available. Sometimes he stood on the road to complete a stage because if she kept it unfinished, she had to start the stage from the first (Nikli-PEER3- T4).

She faced some problems also because it was challenging to complete the course using a mobile phone. The network of her area is also poor, and it took time to load the page. (Nikli-PEER2-Study 1a-T2)

1A: Anonde Gonit Shikhi

Large number of teachers have enrolled in the course so that they can learn new teaching skills and techniques. However, there are many teachers who were motivated to complete the course in order to obtain a certificate.

1A: Anonde Gonit Shikhi

Learning new skills and certificates motivated teachers

1A: Anonde Gonit Shikhi

When he learned that other teachers who completed the course, obtained certificate. He also enrolled in the course to obtain a certificate. He completed the course so that he can utilize the certificate for different purposes. These ideas motivated him to the course. (Dhormopasha-PEER4-T4).

He completed the course when the instruction had given. He had a personal interest in doing the course because of its certificate. He says the certificate is very attractive and inspires him to do the online course; for him, it's the first online course (Nikli-PEER1-T3)

He came to know about this course from his friends who shared that they receive certificates for completing this course. Hearing this the teacher was also motivated to do the course. So, he completed the course online (Dirai-PEER1-T2).

He completed the course so that he can obtain a certificate. Moreover, he was motivated in doing the course to obtain certificate that he can use later to participate in competitions like Gonit Olympiad and National Olympiad (Dhormopasha-PEER3-T4)

After corona when the teacher saw other teachers discuss the techniques, she was interested to do the course. She wanted to learn new teaching skills and Knowledge. Moreover, she could obtain a certificate from the course, so she decided to do the course. (Dhormopasha-PEER4-T1)

As she said the always tries to learn new things. the course will help her discover a new technique to teach mathematics and develop her numeracy skills. Therefore, she was interested to enroll in the course. (Mithamoin-PEER 1-Study 1a-T1)

My participant told me that she is craving for the improvement of her skills. She thinks she is already lagging behind so she does not want to miss any chance that might help her professional development. (Alikadam-PEER2-T5)

1A: Anonde Gonit Shikhi

Female teachers are comparatively less motivated to do the Anonde Gonit Shikhi due to their family responsibilities or household chores.

1A: Anonde Gonit Shikhi

Family responsibilities limit female teachers' course access

1A: Anonde Gonit Shikhi

My participant talked about a female teacher who had not completed the course. The teacher remains busy with her family and less interested in developing her skills. She has three children Moreover, her husband is unemployed. For these reasons all the responsibilities of her family fall upon her. When others were completing the course, she was busy with her own family (Ruma-PEER1-T3)

She said that sometimes male teachers get better opportunities. They go outside to places where there is a network. However, if there is no net in the home, they are doomed too. Female teachers get less chance of going out due to loads of household tasks. (Dharmapasha-PEER4-T2).

She thinks she has rather a gender influence on her access to using the digital devices. The teacher is a female. She has to work a lot for her family and babies. She gets tired after doing all the household stuff. So, she thinks she has less time than her husband and other male colleagues. She said that she has more workload at home (Ruma-PEER1-T4-Study).