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Double Blinded Peer Reviewed Journal

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Editorial

The National Academy for Primary Education (NAPE) is set to release the fifteenth edition of the "Primary Education Journal," a yearly publication aimed at promoting high-quality primary education. The journal includes seven research-based articles covering various topics and problems in primary education.

The first article examines the integration of science content in Bangladesh's primary science curriculum, recommending curriculum developers and textbook authors to integrate science content across disciplines.

The second article investigates digital device addiction among primary school students, highlighting the need for effective preventive measures.

The third article examines the effectiveness of the Second Chance Education Program in Bangladesh, focusing on out-of-school children and teachers' perceptions.

The fourth article investigates the comprehension of science process skills in primary science teaching practice, revealing that teachers in Bangladesh do not fully understand these skills.

The fifth article analyzes the professional development of primary school head teachers, highlighting the need for continuous professional development, collaboration, material and social rewards, respect, and democratic leadership.

The sixth article examines Bangladeshi primary school teachers' readiness to use group work in science classes, highlighting the need for more training and information.

The seventh article investigates factors affecting the academic performance of grade three students in Bangladesh's government primary schools.

The final article aimed to enhance Bangla reading fluency among grade three students, revealing an average reading rate of 49 correct words pen minute and 48% comprehension rate.

All of the papers, in my opinion, will help ensure Bangladeshi elementary education of excellent standard. To develop new interventions in the primary sector, I think we need to create an evidence-based solution process. This will aid in the formulation and efficient application of policy by policymakers.

My sincere gratitude to the editorial board members for lending their knowledge and putting in the effort required to establish the magazine as a global standard. I also want to express my gratitude to the expert panel for their thoughtful advice and cooperation in maintaining the calibre of the papers.

Lastly, I value the thoughts and feedback that readers have provided on the current issue, as these motivate us to enhance and improve subsequent releases.

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Integration of Contents in Primary Science Education: Evidence from Intended Curriculum and Classroom Practice

Kalyani Bain[1] and Mohammad Nure Alam Siddique[2]

Abstract

Integration is an approach that purposefully connects learning to developing a comprehensive understanding. This qualitative study has explored how science contents are integrated at the intended and implemented levels of Bangladesh's primary science curriculum. Document analysis of the curriculum and textbooks was done to explore the intended curriculum. In contrast, classroom observation and interviews of 9 primary science teachers were conducted to explore the implemented level, i.e., classroom practice. This study finds that the Primary science curriculum needs to be more well-organized in terms of integration. In the intended curriculum and textbooks, intra-disciplinary integration, i.e., integration among different sub-disciplines of science, is adequate in some cases and not adequate in the rest, while in certain cases, contents are confined to only one sub-discipline. Integrating science with other disciplines has yet to be found. This study also finds that Primary science teachers need to possess adequate and precise ideas on curriculum integration. In practice, they mainly follow textbooks to make decisions about integrating content. This study recommends that curriculum developers and textbook authors make efforts to integrate the science contents within and across the disciplines. Teacher education and teacher training programs also need to address curriculum integration to promote integrated science teaching-learning.

Keywords: curriculum integration, primary science, science curriculum, intended curriculum, implemented curriculum

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Introduction

In its simplest conception, integration is about making connections (Drake & Burns, 2004), and this connection could be within and across learning areas (Fraser, 2010). Mulenga (2018) described the curriculum as all the educational

experiences provided to learners consciously or unconsciously under the authority of an educational institution to achieve the designated learning outcomes. Marsh and Willis (2003) added that curriculum is concerned with both planning and execution, and it includes an interrelated set of plans and experiences that a student undertakes under the guidance of a school. Intended, Implemented and Attended are the three primary forms or levels of a curriculum (Akker, 2004) and it consists of several interrelated components. Besides objective, method and evaluation, content is regarded as one of the four main elements of a curriculum (Marsh, 2008). According to Edith Cowan University (2001), content should be organized effectively to achieve the goals and objectives of the curriculum. Ehsan (1997) and Print (1993) argued that along with a sequence of content, the scope of content is regarded as an important aspect of the organization of contents in a curriculum. Scope of content means the breadth and depth of content within a curriculum and integration is one of the guiding concepts that help determine the scope (Print, 1993). Several pieces of literature have recognized the importance of the integration of content in a curriculum. University of Alabama's Center for Communication and Educational Technology (as cited in Alberta Education, 2007), as well as VanTassel-Baska and Wood (2009), asserted that integration, i.e., linking among learning areas, positively impacts the achievement of students.

In Bangladesh, the National Curriculum 2012 was developed based on the National Education Policy- 2010, and it has been implemented since 2013. The subject 'Science' at the primary level includes content from different sub-disciplines of science. In current practice, Primary education in Bangladesh consists of five grades (from grade One to grade Five). In grades One and Two, Science is taught as a coordinated subject with Social Science. The National Curriculum and Textbook Board (NCTB) has developed a teacher manual, but there needs to be a science textbook for these grades. All the students study elementary science as a compulsory and unified subject in grades Three, Four and Five. NCTB has developed and distributed Science textbooks for these grades. National Education Policy-2010 (Ministry of Education, 2010) and National Curriculum-2012 (National Curriculum and Textbook Board [NCTB], 2012) have stated that Primary-science will focus on developing a scientific mindset along with other scientific values like questioning, inquisitiveness, innovations, debunking superstitions etc. as well as on linking science knowledge to real-life situations. All these are aligned with the basic concept of scientific literacy, and scientifically literate students are expected to grasp the broad integration of science ideas (Organization for Economic Co-operation and Development [OECD], 2003). Unfortunately, our experiences of dealing with students from upper grades differ significantly from this as, generally, they need help in expressing a comprehensive and integrated understanding of science concepts. With this issue in mind, the integration of content in the current Primary science

education of Bangladesh at an intended level as well as at the implemented level, i.e., classroom practice, has been explored in this study. While exploring the implemented level, special attention has been given to teachers' understanding and practice. Curriculum analysis and review are key to improving the quality as they set the foundation for further development by analyzing the current situation (National Council for Curriculum and Assessment [NCCA], 2005), while Adams (2006) recognized the significance of teachers' understanding as it acts as one of the determining factors in their decision about classroom strategies.

The government of Bangladesh has taken initiatives to update the curriculum to enhance the quality of education. To meet the requirements of the 21st century, a new competency and experiential learning-based curriculum for grades Six and Seven has already been developed, and it will be implemented in 2023. The government has also taken initiatives to develop an updated and new curriculum for the Primary level. Initiatives for planning and executing teacher training programs are also being discussed for the successful implementation of the new curriculum. This study aims to inform the curriculum developers, textbook authors, teachers, teacher educators and other stakeholders of Primary education about the integration of content in the current Primary science education so that necessary actions can be taken from their respective ends to improve the status of integration of content in the future. The purpose of this study was to explore how science contents are integrated into the Primary science education of Bangladesh at an intended level as well as at an implemented level i.e. classroom practice. The research questions of this study are:

1. How are science contents integrated within the discipline in the intended Primary curriculum?
2. How are science contents integrated with other disciplines in the intended Primary curriculum?
3. What is the status of integration of contents in the classroom practice of Primary science education?

Literature review

Levels of Curriculum

Various forms or levels of curriculum can be distinguished by their place in the curriculum process. The three main levels are Intended, Implemented and Attained (Akker, 2004). This paper focuses on the intended and implemented levels.

Intended Curriculum: The intended curriculum refers to the formal statement of aims and a list of content (knowledge or competencies) to be learned in the program and demonstrated in the assessment (Gilbert, 2012). Porter and Smithson

(2001) described the intended curriculum as policy tools such as curriculum frameworks and other relevant documents that guide teachers in the classroom.

Implemented Curriculum: The implemented curriculum refers to what happens in schools, and it represents the local interpretations of formal curriculum documents (UNECO & IBE, as cited in Gilbert 2012). Values and views of the teachers, along with other factors like dominant culture, social values etc. play an influential role at the implemented level. Understanding and views of the teacher act as determining factors regarding their decisions in classroom practice (Adams, 2006).

Integration of Content

Content is considered one of the four main elements of a curriculum, along with objectives, teaching methods and evaluation (Marsh, 2008; Nicholls & Nicholls, 1988, as cited in Edith Cowan University, 2001). According to Drake and Burns (2004), integration is about making connections, while Loepp (1999) refers to the unity among the forms of knowledge and respective disciplines. The New Zealand Ministry of Education (as cited in Fraser, 2010) describes integration as a broad educational approach that makes links within and across learning areas. Alberta Education (2007) defined integration as a curriculum approach that purposefully draws together knowledge, skills, and values from within or across subject areas to develop a more powerful understanding of key ideas.

Different approaches to curriculum integration can be taken. The continuum shown in Figure 1 shows this.

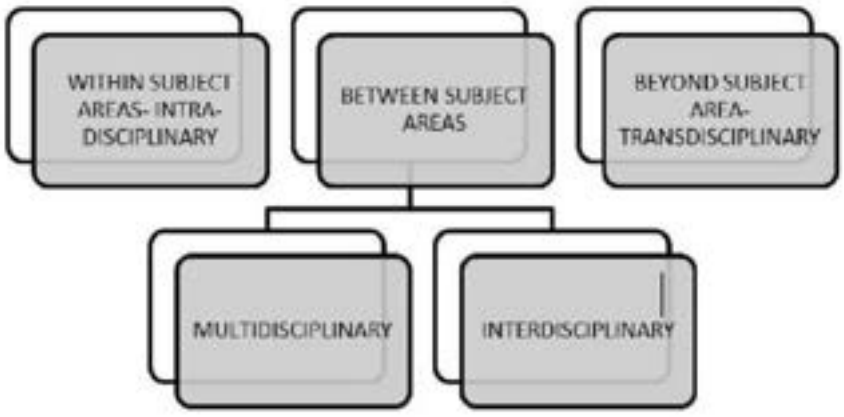

Figure 1: Curriculum integration continuum (Manitoba Education and Training, 1997,

In this study, intra-disciplinary and multidisciplinary integration has been studied.

Alberta Education (2007), as well as Drake and Burns (2004), described intra-disciplinary and multidisciplinary integration as follows-

Intra-disciplinary integration: Contents from different sub-disciplines of one discipline (in the case of Science discipline contents from Biology, Chemistry, Physics, Astronomy, Environmental Science, Health, etc.) are integrated.

Multidisciplinary integration: Contents from multiple disciplines (Science, Social Science, Humanities, Mathematics, Language, Arts etc.) are organized around a theme, see Figure 2.

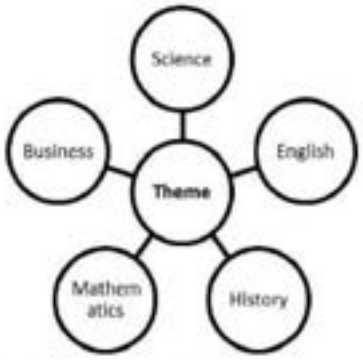

Figure 2: Multidisciplinary integration

Method

Nature: The integration of content in Primary science education was the central phenomenon of this study. According to Creswell (2012), the qualitative research approach is the most suitable one for exploring a central phenomenon, so the nature of the study was qualitative.

Source of data and sampling technique

The primary science curriculum and textbooks were used as the source of data to explore the intended level. These were selected purposefully as they are rich in information necessary for conducting the study (Patton, 1990). For time constraints and as there is no textbook for grades One and Two, this study has explored science textbooks for grades Three, Four and Five along with the curriculum. Besides the curriculum, textbooks have also been used since textbooks act as the de facto curriculum in the Bangladesh context (Siddique, 2007).

Details of the Science curriculum and textbooks used as the sources of data:

- Asgar, A., Huque, M. A., Jahanara, Q. A., & Siddique, M. N. A. (2018a). *Elementary Science: Class Three*. National Curriculum and Textbook Board (NCTB).

- Asgar, A., Huque, M. A., Jahanara, Q. A., & Siddique, M. N. A. (2018b). *Elementary Science: Class Four*. National Curriculum and Textbook Board (NCTB).
- Asgar, A., Huque, M. A., Jahanara, Q. A., & Siddique, M. N. A. (2018c). *Elementary Science: Class Five*. National Curriculum and Textbook Board (NCTB).
- National Curriculum and Textbook Board (NCTB). (2012). *Jatiyo Shikkhakrom 2012- Prathomik Bigyan [National Curriculum 2012- Primary Science]*. NCTB.

For exploring the implemented level, i.e., classroom practice, 9 teachers who teach science at the Primary level along with their classrooms have been used as the source of data. These were selected by using convenience sampling since an available and willing data source was needed for an in-depth understanding, and according to Johnson and Christensen (2008), convenience sampling allows it.

Collection and Analysis of Data

Document analysis was done to collect and analyze data from the primary science curriculum and textbooks. Bowen (2009) stated that document analysis is effective in collecting qualitative data from written documents. A rubric, as well as a continuum for integration, has been used during the document analysis. The same authors developed all these tools for an earlier study (Bain & Siddique, 2017), which explored the organization of content in the junior secondary science curriculum of Bangladesh. The rubric was constructed based on Alberta Education (2007) and Drake and Burns (2004), see Figure 3.

Integration Rubric					
Level-1	Level-2	Level-3	Level-4	Level-5	Level-6
bunch of discrete factual information	being confined to one sub-discipline of science	integrating/ linking among multiple sub-disciplines of science but not adequately	integrating/linking among multiple sub-disciplines of science and for the comprehensive understanding level of integration is adequate	integrating among different sub-disciplines of science and integrating science with other disciplines but not adequately	completely theme/concept based; integrating among different sub-disciplines of science and integrating science with other disciplines adequately for total comprehensive understanding

Figure 3: Integration Rubric

To sum up the status of integration in the Primary science curriculum, a continuum was used, which has 'Discrete factual content' and 'Completely integrated content' as the two extreme ends of it, see Figure 4.

Figure 4: Discrete factual content-Completely integrated content Continuum

For exploring the implemented level i.e. classroom practice, classroom observation and interviews of the teachers were used as instruments for collecting data. Open observation of the teacher's classroom session was done at first, and then a follow-up interview with him/her was conducted using the interview schedule. Observation provides an opportunity to record information as it occurs in a setting and to study what actually happens (Creswell, 2012) and an interview is effective for following up ideas, probing responses and investigating motives and feelings (Bell, 2005). Thematic analysis of the data obtained from the interviews and classroom observations was done as it allows for analyzing and interpreting meaningful patterns or themes within qualitative data (Braun & Clarke, 2006). Following inductive coding (Johnson & Christensen, 2008), codes were generated by directly examining the data. Then, similar coding pieces of data were grouped into minor themes, which finally were merged into two major themes.

Findings

Integration among different sub-disciplines of science has been tried in most cases and the level of this intra-disciplinary integration is adequate in some cases while not adequate in the rest

This study has found that the primary science curriculum and textbooks contain content from different sub-disciplines of science, i.e., physical science, biological science, earth and space science, health science, environmental science, technology, etc. In most of the chapters, intra-disciplinary integration, i.e., linking among multiple sub-disciplines of science, has been tried, and the level of this intra-disciplinary integration is either adequate (Level-4 of the integration rubric) or inadequate (Level-3 of the integration rubric). A few chapters are confined to one sub-discipline of Science (Level 2 of the integration rubric). The position of different chapters in the Integration rubric is shown in Table 1.

Table 1: Position of different chapters in the Integration rubric

Grade Three		Grade Four		Grade Five	
No and Name of the Chapters	**Position in the Integration rubric**	**No and Name of the Chapters**	**Position in the Integration rubric**	**No and Name of the Chapters**	**Position in the Integration rubric**
1.Our Environment	**Level-2**	1.Living Things and Environment	**Level-4**	1.Our Environment	**Level-4**
2.Living and Nonliving Things	**Level-4**	2.Plants and Animals	**Level-4**	2.Environmental Pollution	**Level-3**
3.Different Types of Matter	**Level-2**	3.Soil	**Level-4**	3.Water for Life	**Level-4**
4.Water for Life	**Level-3**	4.Food	**Level-3**	4.Air	**Level-3**
5.Soil	**Level-3**	5.Healthy Lifestyle	**Level-4**	5.Energy and Matter	**Level-3**
6.Air	**Level-4**	6.Matters	**Level-2**	6.Food for Good Health	**Level-2**
7.Food	**Level-2**	7.Natural Resources	**Level-3**	7.Healthy Lifestyle	**Level-4**
8.Hygiene	**Level-4**	8.The Universe	**Level-2**	8.The Universe	**Level-2**
9.Energy	**Level-4**	9.Technology in Our Life	**Level-4**	9.Technology in Our Life	**Level-4**
10. Introduction to Technology	**Level-3**	10.Weather and Climate	**Level-4**	10.Information in Our Life	**Level-2**
10.Information and Communication	**Level-3**	11.Life safety and First Aid	**Level-4**	11.Weather and Climate	**Level-3**
11.Population and Natural Environment	**Level-4**	12.Information in Our Life	**Level-2**	12.Climate Change	**Level-3**
		13.Population and Natural Environment	**Level-3**	13.Natural Resources	**Level-3**
				14.Population and Natural Environment	**Level-4**

Table 1 shows that most of the chapters belong either at Level-4 or Level-3 of the Integration rubric, which indicates that integrating multiple sub-disciplines of science has been tried and the level of this intra-disciplinary integration is adequate (Level-4) in some cases and not adequate (Level-3) in the rest. For example, in the chapter named 'Water for Life' (Chapter 3, Grade Five), multiple sub-disciplines of science, i.e., botany, zoology, physical science, environmental science and health science, have been integrated. Here, contents from different sub-disciplines of science like 'water for plants and animals' (botany and zoology), 'cycle of water' (physical science), 'water pollution' (environmental science) and 'safe water for drinking' (health science) have been organized together around the theme 'water' and linking among them have been discussed thoroughly. So, intra-disciplinary integration within this chapter is adequate, and it is placed at Level 4 on the Integration rubric. On the other hand, in the chapter named 'Climate Change' (Chapter 12, Grade Five), multiple sub-disciplines of science, i.e., physical science and Environmental science, have been integrated. However, the link between these sub-disciplines has yet to be discussed sufficiently. Besides, content related to life science (impact of climate change on animals and plants) could be included in this chapter as it could help the students understand the concept more comprehensively. Intra-disciplinary integration within this chapter is inadequate, and it is placed at Level 3 on the Integration rubric.

Table 1 also shows that a few chapters are placed at Level-2 of the Integration rubric, which indicates that they are confined to one sub-discipline of science. For example, the chapter "Different types of Matter" (Chapter 3, grade Three) is confined to Physics only; the chapter never goes beyond this sub-discipline of science.

No explicit attempt at multidisciplinary integration has been found in the Primary Science curriculum and textbooks

This study finds that multidisciplinary integration, i.e., linking science with other disciplines, has yet to be attempted in the curriculum and textbooks. No explicit attempt to integrate science with other disciplines, like Social Science, Humanities, Language, etc., is found. Table 1 shows that all the chapters from the primary science curriculum and textbooks belong to Level-4, Level-3, or Level-2 of the Integration rubric. No chapter belongs to Level-5 (which indicates intra-disciplinary integration along with integrating science with other disciplines, but the level of this multidisciplinary integration is inadequate) or Level-6 (which indicates intra-disciplinary integration along with integrating science with other disciplines, and the level of this multidisciplinary integration is adequate). Therefore, from Table 1, it is quite clear that no explicit example of

multidisciplinary integration has been found in the Primary Science curriculum and textbooks.

For example, in the chapter named 'Life Safety and First Aid' (Chapter 11, Grade Four), different types of accidents have been presented in detail. Besides, how students can save themselves and others from these accidents has also been discussed. However, more attention should be given to this aspect. So, integrating Science with Humanities and Ethics does not seem to be explicit at all. Another example could be the chapters on environment and environmental pollution. Table 1 shows that there are a number of chapters focusing on this theme in grades Three, Four and Five. In these chapters, along with other contents, various activities like discussion among peers and scientific inquiry by the learners are included. Here, there could be scope for integrating science with the humanities by engaging learners in developing and performing a song or rhyme on the reasons for environmental pollution and what can be done to prevent it. Moreover, when discussing the solution strategies, explicit attempts could be made to engage students in community-based collaborative initiatives. Thus, integrating science with social science is possible.

Position of intended Primary science curriculum on the Integration continuum

From Table 1, it is clear that most of the chapters of the intended Primary science curriculum belong either to Level 3 or Level 4 of the Integration rubric, while a few of them belong to Level 2. So, the Primary Science curriculum could be placed on the 'Discrete factual content' to 'Completely integrated content' continuum, as seen in Figure 5.

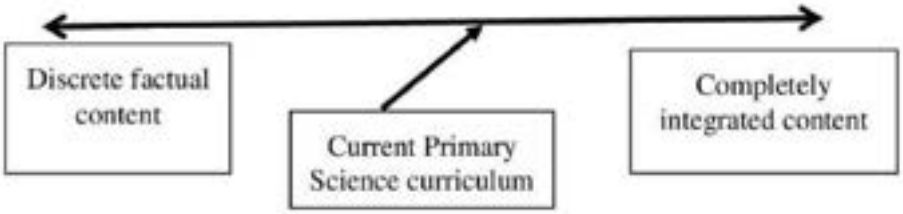

Figure 5: Position of current Primary Science curriculum on a Discrete factual content - Completely integrated content continuum

The current Primary Science curriculum is placed between the two extremes, and this placement is a bit closer to the 'completely integrated content' end as, in most cases, it has tried intra-disciplinary integration but lacks multidisciplinary integration.

Primary science teachers hardly possess adequate and clear ideas on the integration of contents

This study has found that the teachers who teach science at the primary level possess no little knowledge of curriculum integration. Their idea regarding this needs to be clarified in most cases, though after having some idea, some of them have claimed that integration of contents seems to be important to them. Most of the participant teachers feel that contents from different sub-disciplines of science could be linked in some chapters, but they have emphasized that it is only applicable to some of the chapters. During the interview, one of the participant teachers, Ms. Sultana, said, "Yes, I think that (intra-disciplinary integration) could be possible. Nevertheless, it should not be done always. It should not be done in tougher chapters, especially in the chapters focusing on Physics."

Very few of the participant teachers have acknowledged the scope of integrating science with other disciplines like Social science, Humanities, Language, etc., while most of them have expressed their concern that it may add additional complexity. Mr. Shyamol, one of the participant teachers, has stated that multidisciplinary integration will make science learning more complex. Hence, it will be problematic.

Teachers mainly follow textbooks for making decisions about the integration of content while teaching in the classroom

This study has found that Primary science teachers tend to follow the textbook when making decisions about whether they will integrate the science contents or not. This practice is applicable for both intra-disciplinary integration, i.e., linking among multiple sub-disciplines of science, and multidisciplinary integration, i.e., linking science with other disciplines. From classroom observations, it is quite evident that textbooks act as the main guideline while classroom teaching-learning is concerned. The decision about whether science content will be integrated or not is no exception in this regard. All of the participant teachers of this study are found to follow the textbook explicitly while conducting teaching-learning in their respective classrooms. None of them went beyond the respective textbook. According to three of the participant teachers, in very rare cases, they may go beyond the textbooks. The other six participants revealed that, generally, they like to conduct their teaching sessions within the textbook. For example, Ms. Reshma, who teaches science in grade five, conducted a teaching-learning session from the chapter 'Climate Change' (Chapter 12, Grade Five). Though the curriculum and the textbook have tried to integrate multiple sub-disciplines of science, i.e., physical science and Environmental science, the link between these sub-disciplines has yet to be discussed sufficiently in this chapter. This study found that the textbook guided Ms. Reshma in deciding on the integration of the contents. Contents related to life science (impact of climate change on animals

and plants) could be included in the classroom discussion as it might help the students to understand the concept more comprehensively. However, she should have done that by going beyond the book. Besides, she should have tried to link the contents with other disciplines like Statistics, Humanities, Mathematics, etc. at all. In the interview session, when asked about what guided her in integrating content, she said, "I like to follow the textbook. The textbook guides me in every aspect. It is convenient for me.....Generally, I try to teach within the textbook. In very few cases, I may go beyond the textbook, but it is very rare."

On the other hand, Mr. Sharif, who teaches science in grade three, was teaching a lesson from the chapter named "Different types of Matter" (Chapter 3, grade three). The contents of this chapter are confined to Physics only. It has been found that Mr. Sharif also followed the textbook throughout the class and stayed within the book. He should have tried to link the contents with other sub-disciplines of science or with other disciplines like Mathematics, Humanities etc. During the interview, when he was asked why, he did not even try to go beyond one sub-discipline of science. He replied, "I like to follow my textbook. Why would I go beyond the textbook? ... I don't know. I follow the textbook. I do it always. Is this wrong? I think my colleagues also do the same." Therefore, it is quite evident that textbooks act as the main guideline when it comes to classroom practice.

Discussion

This study has found that in the intended Primary science curriculum and textbooks, integration among different sub-disciplines of science has been tried in most cases, and the level of this intra-disciplinary integration is adequate in some cases and not adequate in the rest, while a few chapters are confined to just one sub-discipline. An explicit example of multi-disciplinary integration, i.e., integrating science with other disciplines, is not found in this study. Therefore, the Primary science curriculum and textbooks are not well organized in terms of integration as they lack adequate reflection of intra-disciplinary integration and do not reflect multi-disciplinary integration. This study also finds that primary science teachers need more and clear ideas on curriculum integration, though they claim that the integration of content seems to be important to them. It has also been found that in practice, they mainly follow textbooks when making decisions about whether or not they will try curriculum integration.

Following textbooks for making instructional decisions in the classroom is consistent with literature. According to Farooqui (2008), textbooks guide classroom practice, while Callison (2003, as cited in Farooqui, 2008) added that no other institutional technology has had more influence on teaching over the past 100 years than textbooks. However, teachers with a lack of knowledge on integration of contents are supposed to hamper the effectiveness of their teaching as several types of research indicate that teacher's knowledge of curriculum along

with other factors like knowledge on the teaching-leaning and subject matter, experience etc. are leading factors of effective teaching (Bagherzadeh & Tajeddin, 2021). Besides, several literatures acknowledge the importance of curriculum integration (Loepp, 1999). According to the University of Alabama's Center for Communication and Educational Technology (2005, as cited in Alberta Education, 2007), intra-disciplinary integration involves connecting different sub-disciplines as well as their relationship to the real world. This institution also reported that intra-disciplinary integration has a positive impact on students' achievement.

On the other hand, according to the National Curriculum Board of Australia (2009), multi-disciplinary integration is important, and explicit emphasis should be placed on this type of integration. Venville et al. (2002) asserted that integrating science with other disciplines contributes to getting a more comprehensive understanding of science contents. Curriculum integration is significant as it enables students to broaden the context of their learning and involves the development of key skills and understandings that transcend single subjects (Alberta Education, 2007). Besides, an integrated curriculum better reflects how students' brains process information and how they learn outside of school, and it is consistent with the natural world (Alberta Education, 2007). According to the Program for International Student Assessment's (PISA) suggestion, scientifically literate persons are expected to get the broad integrating ideas of science that are necessary to understand and explain scientific phenomena (OECD, 2003). Winarno et al. (2020) acknowledged integrated science learning as a practical approach to improving students' skills but added that there needs to be more developed curricula and textbooks to get the expected outcomes. Since the intended Primary science curriculum and textbooks do not reflect curriculum integration adequately and the teachers mainly follow textbooks in the classroom for making decisions about integrating Science contents, it is supposed to lack in ensuring holistic and effective Science learning for the learners, which will eventually result in not achieving scientific literacy.

Implication and Conclusion

The findings of this study have implications for curriculum developers, textbook writers, teaching practitioners and teacher education programs. This study has found that the intended primary science curriculum and textbooks are not fully well-organized in terms of content integration, but teachers tend to follow those guidelines. The government of Bangladesh has taken initiatives to develop a new curriculum for the Primary level. This study recommends that curriculum developers make efforts to make the science contents well-organized in the curriculum by following the principles of integration, and then textbooks need to be written accordingly by the textbook authors. Besides, as teachers do not have

adequate and clear ideas on the integration of contents, initial teacher education, i.e., Bachelor of Education (B. Ed.) and other teacher training programs, may emphasize the significance of integrated science contents as well as the principles of doing it in the classroom. Future and current teachers may also find the findings helpful for improving their practice of teaching integrated science content.

Intra-disciplinary and multidisciplinary integration have been studied in this research, but there are two other types of integration, e.g., interdisciplinary and trans-disciplinary. The existing status of these types of integration can be studied in future research

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Primary School Children's Addiction to Digital Devices: Insights from Parents, Teachers and Students

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Abstract

The issue of digital device addiction among primary school students is currently a matter of concern. The objective of this study is to obtain a full comprehension of the current status of digital device addiction among primary school students in Bangladesh, as viewed by parents, teachers, and students. This research utilizes a qualitative approach and performs a total of twenty-four in-depth interviews with eight individuals from each category, including parents, teachers, and students. The researchers employed a snowball sampling technique to identify students who exhibited signs of digital device addiction and subsequently utilized purposive sampling to choose other participants. The results of this study suggest that insufficient understanding and awareness among stakeholders regarding device addiction, as well as limited parental and school-teacher intervention, contribute to the development of digital device addiction among children. Parents, school administrators, and class teachers must acknowledge the significance of this matter and diligently enforce efficacious preventive measures.

Keywords: Digital device addiction, parental mediation, peer pressure, teachers' inefficiency, negative impacts

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Introduction

The emergence of the contemporary digital age has introduced significant technological advancements that are starting to redefine the way people acquire, employ, and respond to information. The advent of digital and internet technology has facilitated the achievement of previously unimaginable feats (Rugai & Hamilton-Ekeke, 2016). Digital devices such as smartphones, tablets, and laptops have become an essential element in the daily lives of a considerable proportion of the worldwide populace (Schulz van Endert, 2021). People of all ages, genders, races, and educational levels use these for a variety of activities, including work-related tasks, academic endeavours, interpersonal communication, and recreational pursuits (Alamri et al., 2018). The proliferation and essentiality of digital devices in contemporary society have prompted inquiries into their potential advantages or disadvantages (Tülübaş et al., 2023). There have been worries raised about the possible adverse effects of digital device addiction, especially for young children in primary school (Sakamoto et al., 2022).

The overutilization of electronic devices is linked to indications of addiction, such as an intense desire for continued use, experiencing withdrawal symptoms when not using the devices, developing a tolerance to their effects, encountering both physical and psychological problems as a result of usage, and facing challenges in performing routine activities (Arefin et al., 2017). Digital device addiction symptoms are similar to the Diagnostic and Statistical Manual 5 (DSM-5) Substance Use Disorder Criteria and Gambling Disorder Criteria (Chang et al., 2019). The extended utilization of digital devices can result in various issues, such as cervical spine discomfort, visual impairment, spinal misalignment, hindered cognitive growth, heightened levels of stress, exacerbating symptoms of neurasthenia, and compromising the immune system (Chen et al. 2019). It also has an impact on the academic performance of students. Students who display an increased vulnerability to digital device addiction exhibit adverse effects on their academic performance (Hawi & Samaha, 2016). Moreover, digital device addiction has a significant impact on various relationships and students' social lives, including those between parents and children, peers, and interpersonal connections (Huang, 2017). As a significant proportion of primary school children currently utilize digital devices (Kim, 2017), it is a concerning issue for parents, teachers, and other educators to ensure children's physical, social, and psychological well-being along with quality education.

The COVID-19 pandemic has led to a notable increase in the prevalence of digital device addiction all over the world. This surge can be attributed to the circumstances that have forced children to remain at home, participate in remote learning, and rely on digital platforms for communication with their peers (Schulz van Endert, 2021). The integration of digital technologies into primary education

in Bangladesh has witnessed a swift progression, primarily driven by initiatives such as "Digital Bangladesh," which aims to equip young students with essential internet usage skills (Rana & Ali, 2016). Nevertheless, the commendable push for digitization poses several challenges, particularly when considering the unrestricted utilization of digital devices by primary school students, which leads to digital device addiction. This issue has emerged as a subject of apprehension for parents, teachers, and other related stakeholders. There is much research about digital device addiction in the world context; some are in the Bangladesh context, focusing mainly on secondary school, college and university students. There are few studies on primary students' digital devices, but these only focus on the psychological perspective. However, as far as knowledge goes, there needs to be more research on the perceptions of major stakeholders for digital device addiction to gain a comprehensive understanding, especially for primary schools in Bangladesh. As a result, this research aims to gain a comprehensive understanding of the actual state of digital device addiction from the perspectives of parents, teachers, and students in the context of Bangladesh, which will help to identify effective intervention strategies for its prevention based on primary stakeholders' perspectives. Moreover, this study will provide valuable insights that can inform educational policies, guide parental practices, and contribute to the broader discourse on responsible technology utilization within the specific context of primary education in Bangladesh.

Statement of the problem

The widespread utilization of digital devices among primary school children in Bangladesh has prompted apprehension regarding the rise of digital device addiction and its potential ramifications on their welfare and academic achievement. Although prior studies have examined the problem of digital device addiction among adolescents, there still needs to be a greater understanding of how parents, teachers, and students themselves perceive and interact with this issue, particularly in the setting of primary schools in Bangladesh. This study will delve into the following research questions to assist in developing interventions and policies to reduce the adverse effects of digital device addiction and encourage healthy technology usage among primary school students in Bangladesh.

1. What are the knowledge and perceptions of parents, teachers, and students on the issue of digital device addiction among primary school children in Bangladesh?
2. What are the factors that lead to the addiction to digital devices among primary school children in Bangladesh?
3. What are the strategies to reduce digital device addiction among primary school children?

Significance of the study

This study is a significant attempt to investigate the crucial problem of digital device addiction among primary school children in Bangladesh. It addresses a significant gap in current research, which has concentrated chiefly on older age groups and contributes to the literature. This study provides a thorough understanding of the complex viewpoints on digital device addiction in primary education in Bangladesh and highlights the pressing necessity for collaborative efforts from every stakeholder involved by identifying the elements that contribute to addiction and recognizing the areas where awareness and intervention are lacking. This study is significant in making children aware of the negative effects of digital device addiction and the proper use of digital devices to help parents and teachers take preventive measures to mitigate digital device addiction among primary school children. This study is also important for education policymakers to make effective policies.

Literature Review

Engaging in a behaviour repeatedly and excessively, to the detriment of various aspects of one's life, is regarded as indicative of addictive behaviour (Santangelo et al., 2022). An individual who excessively engages with technology to the extent that it poses a threat to his/her attention and detrimentally impacts his/her overall well-being is commonly referred to as a digital device addict (Almourad et al., 2020). The concept of a "digital addict" encompasses a wide-ranging pattern of compulsive conduct observed among individuals who engage with technology. This phenomenon recognizes that an overabundance of exposure to and utilization of these devices can result in a reliance on them and the manifestation of behavioural indicators similar to those associated with addictive disorders. This occurs when users struggle to establish a harmonious equilibrium between their technology usage and their engagement in social interactions beyond the digital realm (Rugai & Hamilton-Ekeke, 2016). There are various categories of addiction related to digital devices. These behaviours encompassed various forms of excessive online engagement, such as prolonged browsing, excessive phone usage, and participation in activities such as gaming, stock trading, gambling, and auctions. Additionally, other manifestations of online addiction were identified, including cybersex addiction, addiction to cyber-relationships characterized by excessive use of social media, and general internet addiction (Gandolfi, 2010). The primary signs of digital device addiction are described as "impaired control," which is correlated with disorders related to substance use. It is typified by withdrawal, tolerance, functional impairment, and obsessive behaviour symptoms (Lopez-Fernandez, O. 2017).

Research suggests that primary school students exhibit a higher susceptibility to developing addiction to digital devices. On average, children dedicate

approximately 3.4 hours per day to participating in online activities using digital devices. The primary devices employed for engaging in video game play and accessing animated content, including cartoons and other programs, are smartphones and tablets, with the popular platform of choice being YouTube. Despite their engagement with platforms such as TikTok, Instagram, and Snapchat, individuals continue to utilize social media (Monitor Report, 2020) actively. According to a study conducted by Zincir et al. (2023), male students were found to allocate a more significant amount of time to engage with digital devices and participate in a range of activities, such as cyberloafing and game addiction, in comparison to their female counterparts. Nevertheless, the excessive usage of digital devices among both male and female students has been found to have negative consequences on their academic performance, personal well-being, and social interactions.

Younger students who exhibit a dependency on digital devices experience a multitude of adverse effects, such as headaches, irritability, bodily discomfort, ocular strain, digital thumb, anxiety, insomnia, and subpar scholastic achievement (Acharya et al., 2013). According to Billieux (2012), excessive reliance on digital devices can lead individuals to experience complete social isolation. A positive association has been observed between the prolonged use of digital devices and the prevalence of visual and musculoskeletal disorders. Females and individuals who engage in device usage exceeding two hours per day exhibit heightened vulnerability to visual and musculoskeletal discomfort. To address health concerns related to digital technology, it is crucial to minimize the amount of time spent using digital devices (Alamri et al., 2018). The addiction to digital devices has a substantial impact on various relationships, including those between parents and children, peers, and interpersonal connections (Huang, 2017). The assertion that the excessive or inappropriate utilization of digital technology is significantly contributing to the discourteous behaviour of young individuals is irrefutable. Instances of impoliteness and lack of manners are frequently observed (Leung, 2014).

Several factors contribute to the development of digital device addiction among primary school students. Baturay and Toker (2019) identified several personal factors that contribute to the development of digital addiction. These factors include low self-efficacy, introspective traits, impulsive behaviours, deficient communication skills, and a sense of isolation. Insufficient familial supervision and support can also be attributed to the development of addiction to digital devices. The absence of familial bonding is also a contributing factor to the phenomenon of children's digital addiction. The phenomenon of children developing a strong attachment to digital items can be attributed to the occurrence of divorce. Apathy arises from a combination of indifference and familial

challenges (Ünlü, 2015). According to Şentürk (2012), familial violence and conflict have been identified as contributing factors to the development of digital device addiction in children (Feng, 2022). Young students in primary school often exhibit a limited capacity for self-regulation and determination, rendering them susceptible to cultivating an unhealthy fixation on a specific topic. According to Che (2019), video games rendered on digital platforms present vibrant and captivating virtual environments, which stand in stark contrast to the monotonous content found in textbooks. This disparity in appeal may contribute to the development of addictive behaviours. Moreover, according to Li (2010), a significant number of young individuals who are addicted to gaming experience difficulties in maintaining concentration during classroom instruction, leading to a tendency to complete their assignments after school hastily. This pattern of behaviour has been found to have a detrimental impact on their overall academic achievements.

Various studies have proposed several control mechanisms for addressing digital device addiction, as indicated by researchers. According to Bae (2017), several protective factors have been identified as potential safeguards against the development of digital device addiction. These factors include affective and supervising parenting, academic motivation, fulfilling peer relationships, supportive social networks, and self-regulation. Parents and teachers should effectively regulate and communicate the frequency and duration of a student's daily and weekly computer game usage. Parents and educators must exert efforts to restrict and oversee the frequency of daily usage, ensuring that it is at most one hour per day and that there are at most five instances per week. According to Tsai et al. (2020), teachers should employ efficient classroom management techniques and design instructional activities to enhance students' peer relationships and attitudes toward the teaching-learning process. According to Chen (2019), parents have the potential to enhance the effectiveness of their guidance to their children regarding video gaming by reducing their utilization of games and mobile devices. In addition, educators can organize classroom debates that facilitate comprehensive discussions among students regarding the merits and drawbacks associated with the utilization of digital devices (Fang, 2022).

In Bangladesh, Hoque (2018) conducted a study on the impact of digital device addiction on the lifestyle of Generation Z in Bangladesh. This study finds that individuals belonging to Generation Z experience significant challenges in terms of their academic pursuits, as addiction to these devices adversely impacts their mental and physical well-being. In another study, Keya et al. (2018) find that digital game addiction can be attributed to various factors, including a troubled child-parent relationship, parental attitudes towards fostering competitiveness in education, parental neglect, the child's experience of loneliness and anxiety, and

permissive parenting. However, there is very limited research on digital device addiction in primary school children in Bangladesh. So, this study aims to get a comprehensive understanding of digital device addiction in primary schools in Bangladesh through the lens of parents, teachers, and students. Based on the above discussion, a conceptual framework is provided that guides the whole research process.

Methodology

This study employs qualitative methods to gain a thorough understanding of Bangladeshi primary school students' addiction to digital devices from the viewpoints of parents, teachers, and students. In-depth interviews were conducted to get information from the participants. Primary school students, parents, and teachers participated in this study. The snowball sampling method was used to choose primary school students who use digital gadgets excessively. Students from the fourth and fifth grades were selected for this project based on their interviewing skills and communication abilities. Eight students from two of each government primary school, kindergarten, Ebtedayee madrasah, and English-medium schools were chosen for interviews from Dhaka City (the Capital of Bangladesh). Metropolitan Dhaka was chosen conveniently. Eight of these children's parents and eight of their teachers were then purposively chosen to gather data. Participants were asked to voluntarily engage in this study after being informed about its objectives and given due consideration, given the delicate nature of the subject matter. Participants received assurances from researchers that all ethical norms would be upheld and privacy would be preserved. Parent and teacher interviews lasted approximately 35-40 minutes, while student interviews lasted 12-15 minutes. Following the collection of all the data, it was manually transcribed and then coded. The acquired data was then analyzed after theme analysis.

Findings of the study

Knowledge and Perception

Most of the parents indicate that they need to learn about what digital device addiction means and what criteria are considered to determine digital device addiction. However, they observe that their children are devoted to using digital devices excessively and behave abnormally. Some parents mention that their children are using digital devices for playing video games, watching cartoons, and other activities for an average of 4-5 hours a day. They also express that if their children do not get the digital device, they start throwing up everything, cry profusely, stop eating and bathing, and misbehave with all like other drug addict person. Not all parents have enough knowledge about ways and strategies to control excessive digital device usage by their children. An Ebtedayee Madrasah student's father said,

> "I do not know how much time using digital devices is considered digital device addiction, but my children crave digital devices, and his abnormal behavior towards digital devices, like drug addiction, anxious me. I do not know how I can control his excessive digital device dependency."

However, most of the teachers have the idea about digital device addiction. Some teachers claimed that they can identify students with digital device addiction through their attitude and behavior. In the classroom and school, some children use some jargon that they learned from playing video games. Some students cannot retain their attention to the class activities and look sleepy all the time when teachers identify the symptoms of digital device addiction. A government school teacher said,

> "One day, I found a student who sat in the backbench and was playing games on his tab during class time. This digital device-addicted boy does not pay attention to classroom activities and always glares vacantly at others."

On the other hand, all of the primary school students perceive digital devices as sources of entertainment, education, and social connection. They are not fully aware of the long-term consequences of excessive screen time and potential addiction. They do not recognize their usage as an addiction, but instead, they take it as a regular part of their daily lives. An English medium-school child said,

"I cannot think of my day without my tab. It gives me pleasure. I do not think playing video games more is harmful anyway."

Causes of Digital Device Addiction

Most of the parents and teachers mention that during COVID-19, children exorbitantly used digital devices to pass a confined life at home. The digital devices being incorporated everywhere without considering necessity is one of the catalysts of digital device addiction. All of the teachers mention that parent's excessive use of digital devices, less time spent with children, lack of consciousness and monitoring, and lack of family bonding are responsible for device addiction. Besides, teachers mention some other reasons, such as lack of space for playing sports, peer pressure and instigation, lack of alternative activities, and lack of screen time guidelines. An Ebtedayee madrasah teacher said,

> "Nowadays, parents are too busy, and they hand over smartphones to their children to fill their gap, which gradually leads children to become more reliant on digital devices."

All of the parents indicate that they cannot send their children to play outside due to the shortage of playgrounds, lack of peer groups, and security in the area, which force them to provide devices to their children. Besides, they mention that online education, which started during COVID-19, is also responsible for inclining their children to use devices. Moreover, in school, students do not get the opportunity to play sports and do not get the opportunity to have fun, which leads to device dependency. They also blame peer groups on whom they are influenced. A kindergarten student's mother said,

> "In this year, my son's school was changed for familial reasons. My son did not use any digital device, but after admission to his current school, by peer pressure, he forced us to buy a tab for him. Now he engages with it day and night with his friends virtually."

Students made it clear that adults and their friends inspired them to use digital devices. Most of the students indicate that they cannot get enough time from their parents, and they are compelled to stay home alone, which pushes them towards digital devices. A government school child said,

> " I do not get my parents the whole day due to their job. After returning home, they spend most of their time on Facebook. I feel bored at home, so I have nothing to do except play video games and surfing online on the tab."

Impact of Digital Device Addiction

Most of the teachers and parents mention the negative impacts of excessive use of digital devices. Excessive screen time negatively impacts students' academic performance due to loss of interest in learning, poor concentration on classroom activities, reduction of study time, and decreased productivity and creativity. A government school teacher mentioned

> " In my class, a child is device addicted. He is not attentive in my class, and as a result, he gets poor marks in my subject."

Excessive digital device dependency hampers student's social life. All of the parents admit that their children behave rudely with others. They do not prefer to go to a relative's house or mix up with neighbours. Extreme device dependency is a barrier to their social and communication skills. Parents are worried for their children's mental and physical health. Children suffer from eye strain, neck pain, headaches, and fatigue. Parents are also anxious about their children's changing lifestyles. An English medium school student's mother said,

> " My kid does not want to eat in time. She goes to bed late at night. She prefers to stay alone. She sometimes behaves abnormally. I am anxious for her upbringing."

Challenge for regulation

Nowadays, most schools provide different tasks to students based on online. Students show pleas for school tasks and use devices for other purposes. All-time surveillance is challenging for parents due to their business, which loopholes children misuse for using digital devices excessively. Most parents mention that they want to control their children's excessive use of digital devices, but children's stubbornness is a major barrier to controlling their use of devices. Parents sometimes set rules for using digital devices, but children do not tend to follow these rules. Their craving for devices, excessive crying, and abnormal behaviour compel parents to allow their children to use devices as they wish. A government school student's mother said,

> "I always try to limit my child's digital device usage. When he sees all his friends playing mobile games, he comes to me and cries to play games. If I do not allow him to use the device, he starts to break utensils and shout. I get afraid to see his abnormal behaviour and allow him to device again."

Teachers also need help in regulating children's use of digital devices. Most of the school teachers mention that they struggle to find a proper guideline for reducing digital device addiction while meeting all the needs of the school. They mention

that due to overloaded work, high teacher-student ratio, and lack of time, they are not able to supervise the children who are addicted to digital devices properly. However, some teachers have reckoned their incompetence as a major obstacle to control device addiction. Teachers need to be equipped with the necessary training to address digital device addiction in the classroom. A Kindergarten school teacher said,

> "To be honest, I do not have any training to control the mechanism of digital device addiction. It is difficult to contribute to control this addiction without knowing it properly."

The addictive nature of digital content, especially in the form of games, cartoons, TikTok, children's web series (YouTube), and social media, makes it challenging for students to set limits on their device usage. However, most children lack self-regulation skills, which is a barrier to control device addiction.

Preventive measure

To mitigate digital device addiction, teachers and parents both emphasize taking preventive measures immediately. However, most teachers mention that parents should give sufficient time to their children. Parents should take them to different places for travel and engage in more outdoor activities. Parents also need to set family rules for digital device usage for themselves and their children. They can establish clear and realistic time limits for the use of digital devices. They can engage their children in a balanced routine, including outdoor activities, homework, and other non-screen-related task. They need to be role models for the controlled usage of devices. Parents need to monitor and supervise properly, including which content their children are searching for or what they are doing on digital devices. An English medium school teacher said,

> "Parent's awareness can contribute to controlling their children's addiction. Parental mediation is important in this regard. That is why parents need to be digitally literate at first."

School is the second catalyst of socialization for children. So, school authorities and class teachers have to contribute to students' digital device addiction control. Parents indicate that the school needs to create a joyful atmosphere, including emphasizing co-curricular and extra-curricular activities. Classroom activities need to be attractive so that students get interested in learning more and keep themselves away from digital devices. Schools can set up guidelines on when and how devices can be used for educational purposes. Schools can also arrange counseling services and awareness programs. A government school student's mother said,

> "Children do not love school due to monotonous teaching-learning activities. If schools take the initiative to ensure a joyful learning environment and counsel students regularly, I think students will give more focus on learning instead of engaging themselves in digital devices."

Discussion

Digital devices are essential for primary school students to cope with this technological era, but excessive usage is detrimental in different aspects. Through the lens of parents, teachers, and students of Bangladesh, this study finds that digital device addiction is a concerning matter now due to its adverse effects on life. This study finds that parents and children need more knowledge about digital device addiction. Parents do not know how to control their children's excessive digital device usage properly, which is also indicated by Buabbas et al.'s (2021) study. This study finds several reasons for primary school student's digital device addiction. All the stakeholders claim that COVID-19 is responsible for pushing children towards digital device usage. Social distance and confinement at home compel parents to give digital devices to their children, which gradually leads them to become addicted to them. Schulz van Endert (2021) also claimed that social distancing and escaping from a monotonous life during COVID-19 pushed to device dependency.

This study indicates that parents' lack of awareness and their dependency on digital devices also lead students towards it, which was also focused on in Baturay and Toker's (2019) study. Besides, parents give their children less time, which makes them more reliant on the device. Furthermore, parents do not monitor their children's activity properly due to their jobs, which is also one of the causes of addiction, which is similar to the findings of Ünlü (2015). Moreover, peer pressure also leads children to be addicted to devices. Children follow their peers' activities in school and discuss different games that encourage them to compete with each other, which is also supported by Thenu & Keerthi's (2013) research.

Furthermore, lack of alternative activities and lack of space for playing sports are responsible for addicting children, which was also indicated by the study of Keya et al. (2018). Moreover, monotonous teaching-learning activities in school and a lack of co-curricular and extra-curricular activities are also blamed for digital device addiction. Che (2019) also blames less attractive classroom activities and the lack of outdoor activities like sports are responsible for children's digital dependency.

This study also finds the impacts of digital device addiction. Digital device addiction negatively impacts students' academic, social, and personal lives.

Students lose the desire to learn and decline their creativity and productivity due to device addiction. They cannot pay attention to study, which leads to poor academic performance, which was also focused on Hawi & Samaha's (2016) study. Digital device addiction is detrimental to students' social life. Children with excessive device dependence prefer to stay alone and do not like to make good relations with friends and family. Billieux's (2012) and Huang's (2017) studies also expressed concern about damaging the social life of device-addicted children. Digital device severely impacts children's mental and physical health. Children do rude behavior with others, throw and break utensils, shout and scream, and show abnormality. Children also suffer from different physical problems, including eye strain, neck pain, headaches, obesity, and fatigue, which is similar to the findings of Arefin et al. (2017) and Acharya et al. (2013) studies.

This study finds some challenges in controlling digital device addiction in primary school children. Parents try to control their children from excessive digital device usage, but children's stubbornness is a major challenge that was also mentioned in Keya et al. (2018) research. Teachers cannot guide students about this issue due to overloaded work, high teacher-student ratio, and lack of proper training about controlling the mechanism of digital device addiction. Parsons & Adhikar (2016) also find that teachers need more knowledge and awareness about digital device usage due to the absence of this matter in professional training in digital literacy. This study suggests some preventive measures based on teachers' and parent's recommendations. Parents need to find time to spend with their children regularly, make outings, and engage children in different extra-curricular activities, which are also recommended in Bae's (2017) study. Moreover, parents need to be digitally literate and present themselves as a role model. Parents and teachers should monitor and supervise regularly to control peer pressure. This study also suggests that schools should ensure a joyful and amusing atmosphere for learning and arrange different co-curricular and extra-curricular activities, which is also prioritized in Tsai et al. (2020) study that can contribute to increasing student interest in learning and declining digital device addiction.

Limitation

This study is qualitative and designed to provide in-depth knowledge. Only Dhaka City was considered, and the sample size was small, so generalization is not possible in this study.

Implication

The findings of this study are important for Bangladeshi policymaking, parental guidance, and educational practices. This study emphasizes how critical it is to develop digital literacy and healthy technological habits in young children to equip them with the skills necessary to navigate the digital world safely. This

study's findings will guide parents and teachers in taking effective preventive measures to mitigate digital device addiction. This study will guide school authorities and education policymakers to take adequate measures for lessening digital device addiction and proper usage of digital technology among primary school children. Besides, this study will guide future research to explore the relationship between digital device addiction and primary school children's academic performance and socio-emotional well-being.

Conclusion

This study explored the exact scenario of digital device addiction in primary school children of Bangladesh through the lens of parents, teachers, and students. Lack of knowledge and awareness among the stakeholders about device addiction and lack of parental and school-teacher mediation are the causes of digital device addiction in children. Considering digital device addiction's detrimental effects on children's academic and social lives along with physical and mental health, parents and schools should take this issue seriously and try to implement the preventive measures that are suggested in this study.

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Factors Influencing out of School Children Education Program as Second Chance Education in Bangladesh

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Abstract

Second-chance education, through a nonformal approach, is vital for empowering those who dropped out or never enrolled, enabling their reintegration into the education cycle. This study investigates the impact of the Second Chance Education Program initiated by the Government of Bangladesh. The primary objective is to assess the effectiveness of second-chance education for out-of-school children at non-formal schools in Bangladesh and to gauge the perception of teachers and learners towards the program. The research design employed a mixed-method approach, combining qualitative and quantitative data collection and analysis from both primary and secondary sources. Data were gathered from strategically chosen second-chance education learning centres across five districts in Bangladesh, with respondents including learners, teachers, parents, program organizers, and supervisors. Various tools, such as questionnaires, interview schedules, opinion rating scales, and field notes, were utilized for comprehensive data collection. The study highlighted influential factors that drive learners' interest in second-chance education, including disadvantaged backgrounds, limited resources, and the program's flexible modality. Despite concerns about delayed stipend disbursement, learners generally displayed positive attitudes towards the program, expressing satisfaction with classroom activities and teacher behaviour. While teachers demonstrated readiness through training, local monitoring, and central academic supervision, dissatisfaction emerged regarding salary disbursement and overall program management.

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Thus, the study recommends addressing these issues by ensuring prompt stipend distribution to students, establishing efficient program management, securing sustainable funding, specifically staff salary, implementing student-centered approaches, monitoring the school environment, and fostering collaboration with formal schools for learner mainstreaming.

Keywords: *Second Chance Education; Nonformal Education; Primary Education, Drop out children; Out of school children; Bangladesh.*

Introduction

Education plays a pivotal role in enhancing human capabilities, contributing to socio-economic development, and shaping a prosperous future. In Bangladesh, challenges to national progress, such as high levels of poverty and illiteracy, underscore the significant demand for basic education, particularly among economically disadvantaged populations. Families grappling with financial constraints often face tough decisions regarding their children's education, leading to a substantial segment being excluded from formal education or dropping out prematurely (Islam, 2020).

The rigidity of the existing formal education system poses a formidable obstacle, prompting the need for an alternative approach. Second-chance education, employing a non-formal method, becomes crucial in enabling individuals to become competent citizens in the contemporary world. While formal primary education follows a structured, time-bound, and certificate-oriented system, non-formal education offers flexibility tailored to specific needs, targeting particular groups in terms of age, time, curriculum, duration, and location (Latif, 2013).

The provision of second-chance education with a focus on flexible learning modes and arrangements is extended to underprivileged children in Bangladesh. This non-formal primary education initiative is a collaborative effort involving government organizations (GO), non-government organizations (NGOs), and international non-governmental organizations (INGOs). Various NGOs, operating under the umbrella of the Bureau of Nonformal Education (BNFE) and the Directorate of Primary Education (DPE), have executed second-chance education programs for out-of-school children in 64 districts of Bangladesh. The aim of this program is to mainstream 10 lacs out-of-school children through a nonformal approach (BNFE, 2020). Thus, this study investigated the factors influencing students', teachers', parents', and other stakeholders' interests in Second Chance Education.

Problem Statement

The constitution recognized 'education as a fundamental right' in Bangladesh. However, the data evidenced by a literacy rate of 74.68%, a significant portion of

the population remains illiterate, with a primary cycle drop-out rate of 14.15% (APSC, 2021) and approximately 10 million out-of-school children (UNESCO, 2014). Among these, over 7.4 million face harsh working conditions. Second Chance Education (SCE), a non-formal approach under the Primary Education Development Program (PEDP4), aims to provide education to underprivileged children who missed their initial opportunity for formal primary education. However, a distinct understanding of SCE's effectiveness needs to be improved, hindering Bangladesh's progress towards achieving 100% literacy. Therefore, this study aims to investigate the factor's impact on SCE and provide valuable insights; the research seeks to inform policy-making, program design, and service provision in the SCE, ultimately contributing to Bangladesh's goal of universal literacy and sustainable development. The needs of the disadvantaged portion of the population are unique, which affects on availing their education opportunity. A few studies were conducted on this particular issue, deep digging into the factors of access and retention in second-chance primary education. Thus, this study focuses on identifying the factors of accessing the SCE program.

Purpose and Research Questions

The purpose of the study is to determine the factors influencing learner interests in enrolling into Second Chance Education at a non-formal school in Bangladesh. To achieve this purpose, the following specific research questions have been addressed:

The specific Objectives of the study were to:

- What factors are influencing learners to enroll in Second Chance Education at nonformal schools?
- How do learners' attitudes influence the implementation of the Second Chance Education program?
- Which factors influence teachers' attitudes towards the Second Chance Education program?

Rationale of the Study

The study is rooted in the constitutional recognition of education as a fundamental right for all citizens of Bangladesh. Despite the nation's literacy rate reaching 76.8% and the functional literacy rate (7+ above years) being 62.92%, a significant portion of the population remains illiterate (BBS, 2023). The Annual Primary School Census (APSC) of 2021 reveals a primary cycle drop-out rate of 14.15%, and UNESCO's Global Education Monitoring Report (2014) identifies approximately 10 million out-of-school children in Bangladesh. Moreover, over 7.4 million working children face harsh conditions. In alignment with the principle that every human has the right to education, the study focused on

underprivileged children who missed their initial opportunity for formal primary education. The provision of Second Chance Education (SCE) through a non-formal approach is deemed crucial for its survival in the modern knowledge-based society. Despite the inclusion of SCE in the Primary Education Development Program (PEDP4), a distinct impression of SCE's effectiveness needs to be improved.

The study aimed to address this gap by offering insights into SCE, exploring its characteristics, such as smaller classrooms and flexibility, and evaluating its unconventional teaching methodologies. While GOB and numerous NGOs actively pursued second-chance education, the study's uniqueness lies in its exclusive focus on this vital topic. By shedding light on SCE and providing valuable information and suggestions, the study aspired to contribute to the enhancement of non-formal education, ultimately propelling Bangladesh towards achieving 100% literacy in the near future by investigating the factors that influence dropout children or out-of-school children at second chance education program.

Literature Review

Nonformal education stands as a purposeful and systematic approach designed to meet the learning needs of educationally disadvantaged individuals outside the formal educational institutions. This pedagogical approach emphasizes flexibility over the rigid structures inherent in formal education systems. According to the Nonformal Education Policy of Bangladesh (2006), nonformal education is defined as a purposeful and systematically organized form of learning that typically occurs outside formal educational institutions. It caters to the learning needs of individuals from diverse ages and backgrounds, offering flexibility in terms of organization, time, and place. This form of education embraces/encompasses basic and continuing educational programs, aiming to impart essential literacy skills, life skills, work skills, and general cultural knowledge and fostering lifelong learning. Particularly effective for educationally disadvantaged populations, nonformal schools in Bangladesh, often community-based, operate with flexible hours and specific curricula. The objectives of nonformal education programs in developing countries, spearheaded by non-governmental organizations (NGOs), are multi-faceted. These programs strive to reduce mass illiteracy, contribute to the basic education of children from impoverished families, promote the participation of girls in education, empower women, and support the government's universal primary education program. Notably, upon completing the nonformal education cycle, children are equipped to continue their education in mainstream formal schools, highlighting the symbiotic relationship between formal and nonformal education.

The landscape of nonformal education in Bangladesh has undergone significant transformations since its initiation in 1956. Initially marked by the distribution of radio sets for schools and the establishment of the Audio-Visual Education Centre in 1962, progress was hampered by political turbulence. However, after the liberation of Bangladesh in 1971, the government prioritized nonformal education initiatives. Both governmental and non-governmental organizations initiated diverse nonformal education projects, reflecting a commitment to extending educational opportunities beyond the formal system. Government-led projects, such as the "Integrated Non-formal Education Program" (INFEP) under the Primary and Mass Education Department (PMED), involved 19 district coordinators overseeing 5000 centres across the country for three years. Challenges inherent in Bangladesh's socio-economic conditions, limited infrastructure development, and restricted access to technology persist in the implementation of nonformal education programs. Despite these challenges, the landscape of nonformal education remains diverse, with various activities addressing literacy and numeracy, life skills training, and income generation initiatives. In addition to government-led initiatives, non-government organizations play a pivotal role in extending basic literacy and numeracy skills. Organizations such as BRAC, FIVDB, and DAM contribute significantly to adult literacy programs. NGOs typically adopt participatory teaching approaches, focusing on life skills covering social, environmental, health, and legal issues. Despite challenges, NGO initiatives have made substantial impacts, with BRAC alone establishing around 25,330 centres for nonformal education, positively influencing over a million neo-literates.

However, a recent initiative by GO-NGO collaboration was the "Out of School Children" Program, operating as the Second Chance Education (SCE) Program under the Primary Education Development Program (PEDP-4) Component-2, specifically addressed issues of equitable access and participation. With the primary school dropout rate at 14.15%, the SCE program aimed to provide a flexible non-formal education system to one million out-of-school children aged 8-14. Recognizing the challenges posed by socio-economic factors and geographical constraints, the SCE program not only offers a second chance for primary education but also supports the mainstreaming of out-of-school children into formal education. The program spanned from July 2018 to June 2023, aligning itself with the broader framework of the Bureau of Non-Formal Education (BNFE). Its objectives encompassed offering a second chance for primary education to out-of-school children and integrating them into the mainstream formal education system. The target group comprises one million out-of-school children aged 8-14 across Bangladesh, excluding Reaching Out of School Children (ROSC) program areas.

According to the program implementation arrangement (BNFE, 2018), this program provided a second chance/opportunity to drop out or never enrol learners in Learning Center-based teaching-learning. To establish learning centers (LC), suitable spaces were rented, adhering to guidelines for size and facilities. Designed to accommodate 20-30 students, the learning centres offer flexibility for merging based on enrollment. Rural schools operate six days a week, while urban schools may consist of 2-4 Learning Centers. Support to students includes the provision of school dresses, bags, and stipends based on specific criteria, contributing to the removal of barriers hindering access to education. The selection of teachers was a rigorous process, ensuring gender balance and specific qualifications. Comprehensive training for teachers is undertaken to ensure the delivery of quality education that aligns with the program's objectives.

A robust Monitoring and Evaluation Framework was integral to ensuring the success of the SCE Program. Regular coordination meetings between ISAs, BNFE, and stakeholders provided a platform to review progress, address challenges, and strategize for effective implementation. The Program Steering Committee (PSC) and Program Implementation Committee (PIC) played pivotal roles in guiding policy decisions and monitoring overall progress. Technical Support and Collaboration were facilitated by the Institute of Education & Research (IER), University of Dhaka, acting as the Specialized Agency (SA). A Technical Assistance (TA) Team deployed by the SA offers comprehensive support. District BNFE Assistant Directors and the Upazila/Thana Second Chance Education Committee (USCEC) collaborated to manage SC Schools at the grassroots level. National NGOs, functioning as Implementation Support Agencies (ISAs), coordinate and supervise field-level implementation. An Independent Verification Committee at the local level, consisting of government officials and stakeholders, acts as a third-party monitor, ensuring transparency and accountability.

In conclusion, nonformal education in Bangladesh has a rich history of initiatives, both government and non-government efforts, aimed at extending educational opportunities to diverse segments of the population. Challenges persist, particularly in fostering mass motivation, but collaborative efforts between the government and NGOs continue to make significant strides in addressing the multifaceted objectives of nonformal education. The implementation of the Second Chance Education (SCE) Program, with its focus on reintegrating out-of-school and dropout children into the educational system, represents a critical step in enhancing educational inclusion in Bangladesh.

Methodology

The research employed a mixed-method approach, combining quantitative and qualitative data collection and analysis. Primary data were gathered from teachers, students, organizers, and learning centres of the Second Chance Education Program in five districts of Bangladesh: Dhaka, Moulvibazar, Pabna, Kusthia, and Jhenidah. The selection of learning centres utilized convenient sampling, while teachers, students, supervisors, and program organizers were chosen through purposive sampling. A total of 200 students, 10 class teachers, 10 supervisors, 5 Upazila Program Managers (UPM) and 5 parents participated as respondents. On the other hand, secondary data obtained from documents such as Nonformal Education policy, Nonformal Education Law, Second Chance Education Program documents, Nonformal School Operation documents, Training Manual, and Relevant reports were analyzed to explore background information, goals, objectives, planning, management, and training aspects of Second Chance Education. To collect data, questionnaires, interview schedules, opinion rating scales, and field notes were administered, complemented by field notes for capturing significant information. The tools underwent testing and criticism to ensure appropriateness, language clarity, ethical considerations, and relevance to the assessment study. Ethical considerations were observed throughout the research, with prior permission obtained from relevant authorities. However, quantitative data were analyzed using descriptive statistics. In contrast, qualitative data were analyzed in a thematic narrative approach, focusing on the study objectives and emerging themes and concepts from the field data. The research concluded with recommendations based on the findings.

Findings

This part presents the research data gathered through two methods: semi-structured interviews and Likert opinion rating scales. The primary data is collected from learners, teachers, supervisors, and parents, which undergoes sorting before presentation. Qualitative data were analyzed thematically, while quantitative data was analysed through descriptive and inferential statistical analysis using MS Excel. The findings were interpreted through thematic and statistical presentations, utilizing figures, graphs, and diagrams to triangulate both types of data. However, the major findings of this study related to the Second Chance Education Program for Out-of-School Children are as follows:

Factors Influence the Learners

Second Chance Education (SCE) plays a pivotal role in providing educational opportunities to learners who have missed their initial chance for formal schooling. Understanding the factors that influence learners' engagement and

success in SCE programs is crucial for designing effective interventions and policies. Various socio-economic, cultural, and personal factors can impact learners' participation and outcomes in SCE. Factors such as family support, economic constraints, access to resources, prior educational experiences, and societal attitudes towards education can significantly influence learners' motivation, persistence, and learning outcomes in SCE settings. Exploring these factors comprehensively can help identify barriers and facilitators to participation in SCE and inform strategies to enhance access, retention, and success for underprivileged learners seeking a second chance at education. The study delved into key factors that influenced the interest of out-of-school children in the Second Chance Education Program:

Socioeconomic Background and Distance to School:

The data unveiled that learners in the program predominantly hailed from disadvantaged backgrounds, having dropped out due to living below the poverty line and facing challenges in accessing traditional schooling, such as long distances. The flexible modality of the program emerged as a compelling reason for parents and learners to express interest. As one of the parents expressed that:

> 'My child got admitted into a primary school that is a bit far from our house. She felt tired to go to school regularly. We are poor, so we cannot accommodate local transport on a regular basis. So, most of the time, she walked on foot and got late to class. As a result, she dropped out of school. Nevertheless, this school (SCE learning centre) is very close to my door. My baby is happy to go there daily and learn joyfully with their neighbour friends (IPDC3)'.

Another teacher revealed that most of the parents are living under the poverty line in this area. They prefer to use their children as labour instead of sending schools. It is because of the poor socio-economic condition of the population. Furthermore, the govt. primary schools are far away from their home in some cases. For that, parents are not interested in sending their children to formal school. She stated,

> 'The majority of parents residing in this area are below the poverty line. They opt to use their children as labour instead of enrolling them in school. This choice stems from the community's impoverished socio-economic status. Additionally, government primary schools are situated far from their residences in certain instances, leading to parental disinterest in formal education for their children. Therefore, the parents are interested in sending their children to LC of SCE (ILCT2).'

The above data indicated that parents, teachers, and program supervisors emphasized the prevalence of learners from disadvantaged backgrounds in the

SCE program, often citing financial constraints and distance to schools as primary reasons for dropout from traditional schooling. Parents, facilitating increased attendance and engagement among learners, praised the flexible nature of the SCE program.

Education Materials

An essential aspect contributing to learner engagement was the provision of educational materials, including books, khata, pens, and pencils, free of cost. This aspect was particularly crucial for learners who had previously discontinued education due to financial constraints. A learner expressed their sentiment,

> 'I left school in class two because my father could not afford the education costs. But in this school, there is no cost for my studies. We get all of our study materials, such as books, khata, pens, and pencils, from our school free of cost. My parents are also happy with this school. I wish to continue my education (ILDC1).'

The parents' view reflected their scarcity of financial ability to buy the educational materials. They usually hunker after money for their daily living cost. Therefore, it is difficult to buy educational materials for their children. In this regard, one parent stated that,

> 'I had to withdraw my child from school after second grade because we couldn't afford the expenses. However, this school provides all study materials like books, notebooks, pens, and pencils free of charge. My child is thrilled to receive these essentials without any cost. We are grateful for this opportunity, and I hope my child can continue their education here (IPM1).'

The program supervisor also acknowledged the economic situation of the parents, as he mentioned,

> 'An essential factor in fostering learner engagement is the provision of educational materials, such as books, notebooks, pens, and pencils, at no cost. This support is particularly vital for learners who had previously discontinued their education due to financial constraints. However, in this nonformal school, there is no cost for education (IPSM1).'

The data regarding educational materials discloses that the provision of education materials free of cost emerged as a crucial factor in enhancing learner engagement, especially for those facing financial constraints. Learners who had previously dropped out due to financial difficulties expressed gratitude for receiving essential study materials such as books, notebooks, pens, and pencils without any expenses. Parents echoed this sentiment, highlighting their inability to afford education materials and the consequent withdrawal of their children

from school. However, they expressed relief and appreciation for the nonformal school's provision of these materials at no cost, emphasizing the positive impact on their children's education. The program supervisor also emphasized the importance of providing educational materials without cost, recognizing their significance in supporting learners from economically disadvantaged backgrounds and fostering their engagement in education.

Two-Shift School for Working Children

Urban areas introduced a pragmatic approach with two-shift schools, accommodating working children who could choose between morning and day shifts. This flexibility allowed them to balance their studies with contributing to their family's income, fostering both education and economic participation. One of the teachers expressed that:

> *'Some of the children of my school work with their parents in a shop or other job, so they don't get time to join the morning shift class. In order to ensure their regular attendance, this program allows them to join the day shift class. As a result, they can help their family income, as well as their study in the school (ITDC1).'*

Learners are also comfortable attending nonformal school because they usually work to support their families. Therefore, they can choose the shift that fits their schedule. As one of the learners expressed, 'I work with my parents at a shop, so I can't attend morning classes. But, thanks to the day shift option at our school, I can balance my work and studies. This way, I can help my family and continue my education (ILDC3).'

The data in regards to the factors of two-shift schools for working children indicates that urban areas have implemented two-shift schools, providing flexibility for working children to choose between morning and day shifts. This approach enables them to balance their studies with contributing to their family's income, promoting both education and economic participation. Teachers highlight the importance of this flexibility in ensuring regular attendance and supporting children in fulfilling their familial responsibilities. Learners appreciate the option to choose a shift that aligns with their work schedule, enabling them to support their families while continuing their education.

School Bag and Uniform

Another notable factor driving enrollment was the provision of school bags without any financial burden on parents. Learners expressed joy at receiving colourful bags, eliminating the need for parents to incur additional expenses, thus positively influencing the decision to enrol. One learner expressed, 'I am so happy

to get a colourful bag from my school. I took may study materials in this bag and go to school regularly. I love to study in this school (ILP2).'

On the other hand, the study highlighted the positive impact of providing a set of school dresses at no cost to all children in the program. This initiative, funded by the government, played a significant role in enhancing the educational experience for disadvantaged children, as articulated by a participant: 'I got a nice school dress from my school, and it is very free of cost. No one had to pay any money for the school dress, making us happy (ILK3).'

In this regard, one parent happily expressed,

> 'I am delighted that my child received a nice uniform and a colourful school bag from the school. It is a relief for us. My child happily carries all their study materials in this bag and attends school regularly in the school uniform. We are grateful for this school and the support it provides for our child's education (IPP2).'

Data confirmed that the program's enrollment was driven by the provision of school bags and school dresses without imposing any financial burden on parents. Learners expressed joy and enthusiasm upon receiving colourful bags, which eliminated the need for parents to incur additional expenses. Similarly, the distribution of school dresses at no cost, funded by the government, significantly enhanced the educational experience for disadvantaged children. These initiatives were well-received by both learners and parents, contributing positively to enrollment and promoting access to education for all.

Stipend Facilities

The study found that besides other reasons, stipend facilities had a remarkable effect on second-chance education programs for out-of-school children to continue their education. One of the organizers stated that,

> 'The amount of stipend was one of the factors that convinced parents to send their child to second chance school. A stipend funded by GoB was allocated for all the learners of second chance schools in both urban and rural areas in a fixed amount (IPSJ1).'

One parent makes a complaint against the stipend distribution process. He reported that,

> The authority does not usually distribute the allocated money on time. Unfortunately, the learners do not receive money from the stipend even after completion of the grade. Another thing is that the distribution

> procedure through mobile banking requires necessary documents and is not smooth for rural parents like us (IPK2).

However, data found a notable dissatisfaction among learners as well as parents and teachers regarding these stipend facilities. They claimed that after one and half years of the program, learners did not get any stipend from the authority, but they were supposed to distribute it timely. One of the teachers stated that,

> 'Parents were encouraged to continue their children's studies, considering different types of facilities, e.g., free education materials, school bags, school dress, monthly stipend, etc. Unfortunately, children have not received a stipend yet, which creates a dissatisfactory situation among parents (ITJ2).

The study highlighted the significant impact of stipend facilities on the Second Chance Education (SCE) program for out-of-school children, acting as a compelling factor in convincing parents to enroll their children. However, concerns were raised regarding the distribution process, with delays and difficulties reported, particularly in rural areas. Dissatisfaction was notable among learners, parents, and teachers due to the lack of timely stipend distribution despite expectations. This dissatisfaction undermined the program's effectiveness in promoting continued education among underprivileged children despite other supportive measures like free educational materials and school-related expenses.

Joyful School Environment

The study uncovered that the aesthetics and amenities of the learning centres significantly influenced learners. Colourful decorations, well-equipped classrooms, and teaching aids created a joyful environment, particularly resonating with learners from disadvantaged or socially marginalized backgrounds. One boy of the LC expressed their appreciation, stating, 'Our school is wonderful. We can study here nicely, play different games, sing songs, dance, and enjoy this environment very much (ILP2).'

The study further revealed that the aesthetics and amenities of the learning centres played a crucial role in influencing learners' experiences. Colourful decorations, well-equipped classrooms, and teaching aids contributed to creating a joyful environment, which was particularly impactful for learners from disadvantaged or socially marginalized backgrounds. Both boys and girls expressed their appreciation for the pleasant atmosphere, with one girl stating, 'Our school is very beautiful. We can study here nicely, play different games, sing songs, dance, and enjoy this environment very much.' Parents also acknowledged the positive impact of the joyful school environment on their children's enthusiasm for learning, with one parent remarking, 'My child loves going to school because of

the colourful and welcoming environment.' Program supervisors recognized the importance of creating such environments to foster engagement and learning, emphasizing the need to continue providing resources and support for maintaining joyful learning spaces.

The study revealed that colourful decorations, well-equipped classrooms, and teaching aids in learning centres significantly influenced learners, particularly those from disadvantaged backgrounds. Both boys and girls expressed appreciation for the joyful environment, enhancing their enthusiasm for learning. Parents also noted its positive impact on their children's education. Program supervisors recognized the importance of maintaining such environments to promote engagement and practical learning.

In summary, the findings underscored a range of factors contributing to the effectiveness of the Second Chance Education Program, emphasizing the critical role of flexible modalities, free provisions, and the creation of a positive and inclusive learning environment in fostering the education of out-of-school children in Bangladesh.

Factors from Learners' Perspective Towards SCE Program

This sub-section of the findings focuses on the specific factors from learners' perspectives, which accumulate the study to justify the SCE program based on the learner's perspective. Primary data has been collected from learners, which is the basis of the findings. It underpins majorly in two broad areas: the factors that directly impact learning and the other educational factors that focus on supportive learning materials.

The following figures present the perception of influencing factors of learners towards different aspects of the second chance education program for out-of-school children.

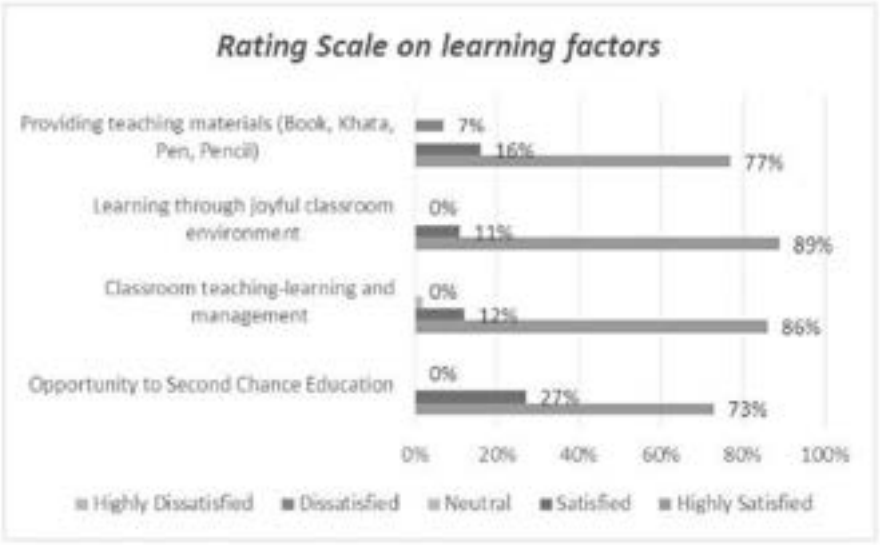

Figure 1: Rating Scale on learning factors

According to Figure 1, a significant majority of learners participating in the Second Chance Education Program exhibited a positive attitude towards various aspects of the program. The data revealed that 73% of learners expressed high satisfaction with being enrolled in the program, while an additional 27% indicated satisfaction, and none provided a negative response. Regarding classroom teaching, learning, and management, the majority (86%) expressed high satisfaction, with 12% finding it satisfactory and 2% remaining neutral in their opinions. Regarding learning in a joyful environment, an overwhelming 89% of learners found the program highly satisfactory, while 11% considered it satisfactory. In terms of teaching materials, such as books, khata, pens, and pencils provided by the program's authority, 77% of learners expressed high satisfaction, 16% found it satisfactory, and a limited number (7%) deemed it dissatisfactory due to delayed distribution.

The data summary indicates that the majority of learners in the Second Chance Education Program held positive views across various aspects of the program. Most learners were satisfied with their enrollment and expressed high satisfaction with classroom teaching, learning, and management. They particularly appreciated the joyful learning environment created by the program. While most learners were satisfied with the teaching materials provided, a small portion expressed dissatisfaction due to delayed distribution. Overall, the findings suggest a generally positive perception of the program among learners.

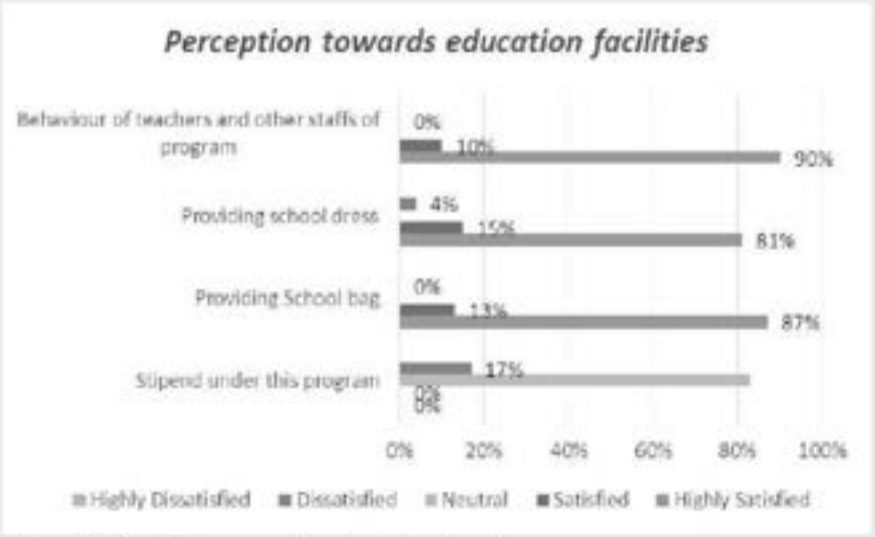

Figure 2: Opinion towards education facilities

The holistic data claimed more than three-fourths (90%) of the learners conveyed high satisfaction with the behaviour of school teachers and other staff members in the Program, with the remaining 10% finding it satisfactory. Conversely, opinions on receiving stipends under the Program were mostly neutral and negative, with 83% of learners choosing not to comment and 17% expressing dissatisfaction for not having received any stipend yet. However, there was widespread positivity towards the provision of school bags and school dresses at no cost. A significant 87% of learners were highly satisfied with the school bags, and 81% were similarly content with the school dresses. A smaller percentage, 13% for bags and 15% for dresses found the items merely satisfactory, while a minimal 4% expressed dissatisfaction with the school dresses.

The findings reflect that the majority of learners in the Program expressed high satisfaction with the behaviour of school teachers and staff members. However, opinions on receiving stipends were predominantly neutral or negative, with a notable percentage expressing dissatisfaction for not having received any stipend yet. Conversely, there was widespread positivity towards the provision of school bags and dresses at no cost, with the majority of learners highly satisfied with both items. Overall, while there were some concerns regarding stipends, learners were generally content with the support provided through school bags and dresses. In conclusion, the collective feedback from learners in the Second Chance Education Program reflects a positive impact towards out-of-school children.

Factors from Teachers Prspective towards Program

This sub-section of the findings emphasizes the specific factors from the teacher's perspective to justify the SCE program. The primary data has been collected from LC teachers through Likert scale, which is the basis of the findings. It focuses majorly on factors directly related to program management and implantation, which is a vital issue for the effective learning of the learners in the SCE program. Figure 3 reveals the factors and perceptions of teachers towards different aspects of the second chance education program.

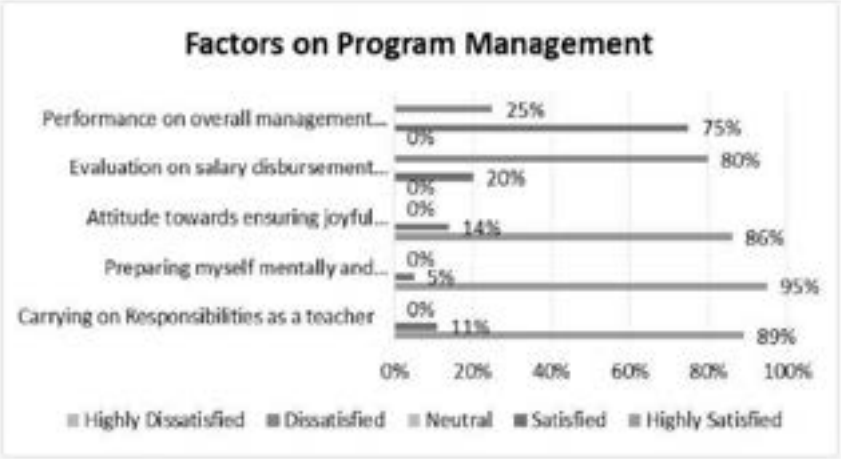

Figure 3: Perception of teachers towards the program

Figure 3 reported that the majority of teachers expressed positive sentiments regarding their responsibilities within the Second Chance Education Program. The data illustrates that 89% of teachers reported high satisfaction with their duties, while an additional 11% found them satisfactory. Regarding the mental and emotional preparation of teachers for teaching, an overwhelming majority (95%) regarded it as highly satisfactory, with a minority (5%) finding it merely satisfactory. More than three-fourths of teachers (86%) deemed it highly satisfactory, while 14% considered it satisfactory concerning their attitude toward ensuring joyful teaching in the classroom. Conversely, a noteworthy number of teachers exhibited a negative attitude toward the timely disbursement of salaries and the overall performance in the management and implementation of the program compared to other aspects. A significant portion (80%) expressed dissatisfaction with the evaluation of salary disbursement, whereas 20% remained

satisfied. Regarding the overall management performance, 25% of teachers claimed it was dissatisfactory, while 75% identified it as satisfactory.

However, the majority of teachers maintained a positive impression regarding their readiness, effort, and attitude for effective and joyful teaching-learning activities in the Learning Centers. On the other hand, a notable number of teachers held a negative impression towards the salary disbursement for teachers and other staffs, as well as other managerial issues.

Discussion

The research findings underscore the crucial role of addressing socio-economic barriers to education, particularly for learners from disadvantaged backgrounds, aligning with existing literature on educational equity and access. Several studies have highlighted financial constraints and distance to schools as primary reasons for dropout from traditional schooling among disadvantaged populations (Aikman & Unterhalter, 2005; Jimenez-Silva & Castillo, 2020). The flexible nature of the Second Chance Education (SCE) program, praised by parents, resonates with research emphasizing the importance of flexible learning models in increasing attendance and engagement among marginalized learners (Bray & Kwo, 2013; Motala, 2019).

Moreover, the provision of education materials free of cost, as highlighted in the data, aligns with literature emphasizing the significance of removing financial barriers to learning materials in enhancing learner engagement and retention (Bruns et al., 2011; UNESCO, 2019). Learners' expressions of gratitude and parents' relief at the provision of these materials echo findings from studies demonstrating the positive impact of such support on educational outcomes (Stephens & Ratcliff, 2015; World Bank, 2018). Similarly, the findings regarding the provision of school bags and dresses without financial burden align with research on the importance of removing economic barriers to education and promoting access to learning resources (Goyal & Agrawal, 2020; Sabates & Hersh, 2011). The positive impact of these initiatives on enrollment and access to education is consistent with studies emphasizing the role of supportive measures in promoting educational participation among disadvantaged children (Berlinski et al., 2020; Filmer & Schady, 2009).

The further finding claims that the joyful school environment positively impacted learners resonates with existing literature highlighting the significance of creating engaging and inclusive learning spaces. Research suggests that a positive learning environment contributes to increased motivation, improved academic performance, and enhanced overall well-being among students (Hattie, 2009; Martin & Dowson, 2009). For example, Hattie (2009) emphasizes that a

supportive and positive classroom climate is one of the most influential factors contributing to student achievement. When students feel safe, valued, and supported in their learning environment, they are more likely to actively engage in learning activities and develop a positive attitude towards education (Martin & Dowson, 2009).

Moreover, the emphasis on the teachers' positive responses to their responsibilities aligns with the literature highlighting the importance of teacher attitudes and behaviours in shaping the classroom climate. Research suggests that teachers' enthusiasm, encouragement, and supportive interactions with students can significantly impact students' motivation, engagement, and academic outcomes (Skinner et al., 2008; Wubbels & Brekelmans, 2005). When teachers demonstrate care, respect, and enthusiasm for teaching, students are more likely to feel motivated, valued, and engaged in their learning (Skinner et al., 2008). Overall, the findings underscore the importance of creating a joyful and supportive learning environment for students, as well as the positive impact of teachers' positive attitudes and responses to their responsibilities on student engagement and learning outcomes.

However, concerns raised regarding stipend distribution highlight challenges in program implementation, reflecting broader issues of administrative efficiency and resource allocation in education systems (Härmä et al., 2018; UNESCO, 2016). Addressing these challenges is crucial for ensuring the effectiveness of programs like SCE in promoting continued education among underprivileged children.

In conclusion, the research findings corroborate existing literature on the importance of addressing socio-economic barriers and providing comprehensive support to promote educational access and retention among marginalized populations. While the SCE program demonstrates positive impacts on learner engagement and access to education, addressing challenges in stipend distribution and program management is essential for maximizing its effectiveness.

Recommendations

Based on the research findings, the recommendations to further enhance the effectiveness and impact of the second chance education program for out-of-school and dropout children are as follows:

Address Socioeconomic Barriers:

- Implement targeted interventions to address socioeconomic barriers to education, particularly for learners from disadvantaged backgrounds.
- Develop policies and programs that specifically target financial constraints and distance to schools as primary reasons for dropout among marginalized populations.

Promote Flexible Learning Models:

- Expand flexible learning models, such as the Second Chance Education (SCE) program, to increase attendance and engagement among marginalized learners.
- Provide support for flexible scheduling and alternative learning pathways to accommodate diverse learner needs.

Remove Financial Barriers to Learning Materials:

- Ensure the provision of education materials free of cost to learners to enhance engagement and retention.
- Implement strategies to remove financial barriers to essential study materials, such as books, notebooks, pens, and pencils.

Support Access to Learning Resources:

- Provide school bags and dresses without financial burden to promote access to education and learning resources.
- Implement initiatives to remove economic barriers and promote enrollment and access to education among disadvantaged children.

Create Engaging and Inclusive Learning Spaces:

- Emphasize the importance of creating joyful and supportive learning environments to enhance motivation, academic performance, and overall well-being among students.
- Invest in resources and infrastructure to create engaging and inclusive learning spaces that foster student engagement and positive attitudes towards education.

Promote Positive Teacher Attitudes and Behaviours:

- Provide training and support for teachers to cultivate positive attitudes and behaviors towards their responsibilities.
- Encourage teachers to demonstrate care, enthusiasm, and supportive interactions with students to promote motivation, engagement, and academic success.

Address Challenges in Program Implementation:

- Address concerns regarding stipend distribution and program management to ensure effective implementation of programs like SCE.
- Improve administrative efficiency and resource allocation in education systems to overcome challenges in program implementation and maximize effectiveness.

These recommendations are essential for promoting educational access and retention among marginalized populations and ensuring the effectiveness of programs like SCE in supporting continued education for underprivileged children. Therefore, by implementing these recommendations, the second chance education program can further enhance its positive impact, increase access to

education for marginalized children, and contribute to breaking the cycle of poverty and illiteracy in disadvantaged communities in Bangladesh.

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Exploring teacher's comprehension of science process skills in primary science teaching practice: A case study of an urban area in Bangladesh

Dr. Rezina Ahmed

Abstract

Science process skills play an important role in science education. This study explores primary science teachers' comprehension of science process skills in primary science teaching practice in Bangladesh. Within the qualitative framework, a case study approach focusing on an urban primary science teacher (who teaches science) was purposively applied. The case was considered by three concerned stakeholders (Assistant Upazila Education officer, instructors of Upazila Resource Center, and Primary Teachers Training Institute) along with the teacher. Primary science textbooks and teacher's editions were also used as samples. Data collected from lesson observation, semi-structured interviews, FGD, and document analysis were analyzed using qualitative content and thematic analysis. The findings reveal that in the primary science teaching practice of Bangladesh, teachers do not comprehend science process skills. However, concerned stakeholders have some comprehension of science process skills, which may be reflected in teachers' comprehension and classroom practice as they are engaged in teacher training, supervision, and monitoring. Moreover, the information provided in the curriculum documents may also be reflected in teacher's and concerned stakeholders' comprehension. The findings of the study carry implications for the Ministry of Primary and Mass Education, Directorate of Primary Education, National Curriculum and Textbook Boards, National Academy for Primary Education, curriculum developers, and policymakers to take into account for further improvement of primary science teaching practice.

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The findings provide knowledge to the literature, which will help curriculum developers, textbooks, and teacher's edition writers to develop curriculum documents and researchers for further research on educational settings.

Keywords: Primary science teaching practice, primary science teacher's comprehension, science process skills.

Background of the study

Science Process Skills (SPKs) are integrated with 21st-century skills (Care & Griffin, 2015). The development of SPS is considered essential for scientists and students to understand better science content (Kruit et al., 2018b; Miles, 2010; OECD, 2017). Science process skills are specific abilities and competencies to help students learn science and technology (Akinbobola & Afolabi, 2010). A proposal classified SPS under two main categories–the basic SPS and integrated SPS–whereas the former is considered the necessary building block for the latter (Chabalengula et al., 2012; Padilla, 1990; Rezba et al., 2007). Basic science process skills (BSPS) are observing, inferring, measuring, communicating, classifying, and predicting, which form the foundation of science learning and include skills that all science learners must acquire (Padilla, 1990; Rezba et al., 2007). Integrated science process skills (ISPS) are controlling variables, interpreting data, formulating hypotheses, defining operationally, experimenting, and formulating models (Chabalengula et al., 2012; Padilla, 1990). Science education reforms (American Association for the Advancement of Science [AAAS], 1993) and National Science Education Standards (National Research Council [NRC], 1996) emphasise the teaching of SPS in K-12 science classrooms. Realising the importance of SPS, researchers have suggested that basic science process skills can be acquired from the elementary school period forward, while integrated skills can begin to be acquired in secondary school (Ergin et al., 2005; Nevin & Mustafa, 2010). In Bangladesh, developing SPS is one of the major components of the national science curriculum, from primary to secondary education (NCTB, 2012).

In the meantime, the role of teachers in facilitating the development of quality science education through classroom practices is noteworthy. Teachers should develop students' SPS (Miles, 2010). Harlen (1999) identified that many studies truly emphasise that teachers' understanding of SPS is vital for improving the quality of science education. According to Kim (2007), students' attitude toward science improves when teachers focus on students' SPS through inquiry-based teaching. Some researchers have noted that learners learn more and better science when teachers recognise the relationship between science contents and processes (Novak & Gowin, 1984; Settlage et al., 2002). Therefore, science teachers must

be proficient in SPS and possess strong knowledge, competencies, and understanding to teach the SPS effectively and meaningfully to learners (Settlage & Southerland, 2007; Chabalengula et al., 2012). However, for students to gain these basic and integrated skills at a desired level, the teachers cognitively understand skills (Mutisya et al., 2013). Teachers who need to be better aligned with SPS are a significant source of learners harbouring alternative/ misconceptions on science concepts (Ball & McDonald, 1989; Keraro et al., 2004). In addition, teachers should be able to evaluate students' SPS, which is essential for students' achievement of SPS (Balfakih, 2010; Azizah et al., 2018).

The existing primary science curriculum of Bangladesh has emphasised science process skills in primary science teaching-learning (National Curriculum and Textbook Board [NCTB], 2012). So, it is important to know the practice of SPS in primary science teaching-learning. Studies found that BSPSs are practised to some extent, whereas ISPSs are highly neglected at the junior secondary level (Islam, 2011). Sultana et al. (2019) found that SPS needs to be practised, though the primary curriculum suggests it is not very helpful in promoting scientific literacy, and teachers need more pedagogical knowledge related to SPS. Therefore, this study intends to explore teachers' comprehension of SPS in primary science teaching practice in Bangladesh.

Purpose and Rationale of the Study

This study aims to explore primary science teachers' comprehension of science process skills in primary science teaching practice in Bangladesh. This study's findings may help science education researchers and education authorities know and take necessary steps to determine the existing status of primary science teaching practice. The authorities and institutes involved in teacher and teacher educators' professional development may address the findings of the study to design and implement training programs. Furthermore, the findings from this study will enable educators, policymakers, and curriculum developers to evaluate various aspects of the education system and make changes for improvement accordingly.

Research question of the study

The purpose of this study is to explore the primary science teacher's comprehension of SPS in primary science teaching practice in Bangladesh. To fulfill this purpose this study was undertaken to answer the following question,

How does a primary science teacher comprehend the science process skills for inquiry-based science teaching practice in Bangladesh?

Methodology

This study adopted a qualitative interpretive research methodology, which allowed the study to get the data directly from the participant's natural settings

and attempt to make sense of or interpret phenomena in terms of the meaning people bring to them (Creswell & Creswell, 2018; Denzin & Lincoln, 2018; Mills & Gay, 2016). The central phenomenon of this study was teacher's comprehension of science process skills in inquiry-based primary science teaching practice in Bangladesh, which preferred qualitative research as it is the most suitable approach for exploring and developing a detailed understanding of the central phenomena (Creswell & Creswell, 2018; Mills & Gay, 2016). Within the qualitative framework, a case study strategy was adopted, allowing the study to explore the chosen case (Yin, 2018). The study is exploratory and interpretive, and a small number of samples are preferred to collect data from data sources directly related to events or individuals (Creswell & Poth, 2018). The study selected four types of data sources: teachers, curriculum documents (Textbooks and Teacher's editions), and concerned stakeholders (AUEO, instructors of PTI and URC, and students). Data were compared within the case study to maximise validity (Yin, 2018). Intentionally, teachers, concerned stakeholders, and curriculum documents were selected purposively as the study sought to know the central phenomena by obtaining the necessary data (Creswell & Creswell, 2018).

In this study, one primary science teacher (who teaches science) from one selected primary school was considered as a case or unit of analysis. Four classes of the teacher were observed in lesson observation, and after that, lessons were analysed from documents (Textbooks, Teacher's edition). The case of this study was formed by the following members,

- Primary science teachers (Who teaches science)
- Curriculum documents (Textbooks, Teacher's edition)
- Assistant Upazila Education Officer (AUEO)
- Upazila Resource Center Instructor (URC Instructor)
- Primary Teachers' Training Institute instructor (PTI Instructor)
- Primary students

In this study, a semi-structured interview schedule, lesson observation schedule, and document review protocol provided information on the existing comprehension of teachers and concerned stakeholders. The open-ended, semi-structured interview helped the teacher and concerned stakeholders to unfold their thoughts, opinions, and perceptions in their real context (Lopez & Whitehead, 2013) which verified the accuracy of the observations (Fraenkel et al., 2015). However, lesson observation provides a complete description of teachers' behaviour gathered in a specific natural classroom setting (Ary et al., 2018) and mostly acts as a complementary purpose to the teacher's interview (Swanborn, 2010). Moreover, a review of documents was used in the case study combined with others to support other collected data as a means of triangulation (Yin, 2018). Thematic analysis (Braun & Clark, 2022) and qualitative content analysis

(Patton, 2015) were used for data analysis. Vagias's (2006) Likert-scale technique was used to develop scales for data analysis.

Results

The results presented here were designed about the research question to explore teacher comprehension of science process skills in primary science teaching practices in Bangladesh. Here, the teacher was from an urban area, and other concerned stakeholders were the PTI instructor, URC instructor, and AUEO, who are engaged in teacher training, supervision, and monitoring, from which the teacher gets support for professional comprehension and practice. Some students of the teacher have also participated in FGD. The results of teacher comprehension of science process skills in primary science teaching practices through lesson observation, interviews, and document analysis are presented next.

Teacher lesson practice in science process skills

From the observed lessons, it has been explored that the teacher was somewhat practiced and sometimes did not practice science process skills in the science classes. A teacher's classroom practice focusing on the science process skills of a lesson is shown in Table 1.1, where the teacher somewhat focuses on observation skills.

Table 1.1: Findings of teacher's classroom activities focusing on science process skills

Grade & Chapter	ILO	Lesson in TE	Lesson title	No. of class taken by the teacher	science process skills are given in TB	science process skills are given in the TE	Teacher's classroom activity
Grade-3, Chapter-5, 'Soil'	4.1.2	1	Components of soil	lesson-1	Observation	Observation	did not do
	4.1.1	2 & 3	Different types of soil		Observation decision making	Observation Prediction / decision making	somewhat focus on observation

Stakeholders' views on science process skills

Science process skills are considered necessary tools to produce and use scientific information, perform scientific research, and solve problems (Harlen, 1999; Huppert et al., 2002). Science process skills are some abilities and competencies

that will help students learn science and technology (Akinbobola & Afolabi, 2010). Stakeholders were asked, 'What are the opportunities for students to achieve science process skills through science learning?'. The instructor of URC alluded, Students can observe, measure, count, classify, etc., in their daily lives. Science learning helps them develop these skills for their daily purposes. For example, they can separate food items or plants or measure their seating table, books, etc.

According to the URC instructor, science learning can help students gain some skills for their daily activities. However, the main purpose of achieving science process skills is absent from the explanation that expresses URCI's somewhat comprehension of science process skills.

Moreover, Esler (2001) claimed that modern elementary science curricula emphasize acquiring appropriate science concepts or information and developing science process skills for doing science. Bangladesh's existing science curriculum (National Curriculum and Textbook Board [NCTB], 2012) emphasizes teaching science process skills at the primary level. In response to the question about the information of given opportunities of science process skills for the students provided in TE and TB, the instructor of PTI said,

TB approach is scientific inquiry; all the science concepts of TB focus on different activities that need science process skills. TE also mentioned science process skills but I did not follow it that way.

In the statement, PTII stated the information provided in TB but did not follow TE that way revealing PTII's unawareness of TE.

One of the aims of science teaching is to develop science process skills in classrooms (Sreedevi & Sudhir, 2011). Based on an asked question about the classroom practice of achieving science process skills through science learning, the teacher said,

I do not know about science process skills that way, but I try to follow the activities that are given in TB.

In the statement, the teacher alluded to a lack of knowledge about science process skills, but the teacher followed TB's instructions during activities in the science classroom.

Students' response to FGD

Students were asked about the practice of science process skills in the science classroom. One student of FGD asserted that they usually do not get the chance to do any activity in science classes. Sometimes, the teacher did it by himself in front of the class.

From the statement, it is exposed that teacher did not focus on science process skills in the science classroom.

Information provided in TB and TE of science process skills

It is clearly stated at the beginning of textbooks as "Major features of the revised primary science textbooks" to emphasize problem-solving based learning in primary science that learning activities aimed at the acquisition of science process skills necessary for children to solve the problem (NCTB, 2023). It is also highlighted as the enhancement of learning activities that introduction of a variety of experiments, demonstrations, observations, and investigations to promote the scientific attitude of the pupils (NCTB, 2023).

Analyzing the primary science textbooks and teacher's editions it is found that, there are some activities in each lesson focusing on science process skills like; demonstration, observation, experiment, investigation, and decision-making (NCTB, 2023). Figure 1.1 reflects the science process skill of a lesson in TB. Here, observation skill is mentioned for identifying different types of soil. Figure 1.2, reflects science process skills in TE where also observation skills are mentioned.

The findings of stakeholders' comprehension, document analysis (TB & TE), and lessons observation of science process skills are summarized in Table 1.2.

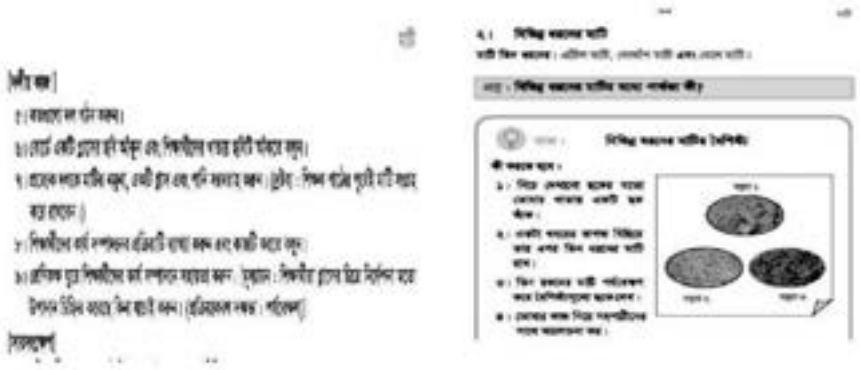

Figure1.2: Reflection of science process skills in TB

Table 1.2: Stakeholders' comprehension of science process skills.

	Stakeholders' comprehension of science process skills			Overall comprehension	Chapter & lesson in Grade three	Teacher 's lesson practice	Provided information in the documents (Based on literature review)	
	Importance of science process skills	Given the information in TE & TB	Way of practice in the classroom				In TB	In TE
Teacher	Do not comprehend	Do not comprehend	somewhat comprehend	Do not comprehend	Chapter:5 Lesson: 1	lessons-1: somewhat practiced	Moderately addressed	Moderately addressed
					Chapter:5 Lessons: 2&3		Moderately addressed	Moderately addressed
PTI instructor	Moderately comprehend	Somewhat comprehend	Moderately comprehend	Moderately comprehend	Chapter:5 Lessons: 4&5	lessons-2: somewhat practiced	Moderately addressed	Moderately addressed
URC instructor	Somewhat comprehend	Somewhat comprehend	Somewhat comprehend	Somewhat comprehend	Chapter: 6 Lesson: 1	lessons-3: somewhat practiced	Not addressed	Not addressed
AUEO	Somewhat comprehend	Somewhat comprehend	Somewhat comprehend	Somewhat comprehend	Chapter: 6 Lesson: 2	lessons-4: somewhat practiced	Not addressed	Not addressed

The findings of Table 1.2 reveal that the teacher did not comprehend science process skills, but somewhat focused on science process skills in the science classroom. The table also reveals that concerned stakeholders mostly have some comprehension of science process skills. However, lessons observed in TB and TE showed that sometimes science process skills were moderately addressed and sometimes not at all.

- **Overall remarks on the comprehension of science process skills**

Though the teacher did not comprehend science process skills it was not reflected in the classroom as the teacher somewhat practiced SPSs. However, somewhat comprehension of the concerned stakeholders may be reflected in the teacher's classroom practices. Moreover, information that moderately addresses science process skills in curriculum documents may also be reflected in the comprehension of concerned stakeholders and teacher's classroom practice.

Discussion

Teachers play an important role in teaching SPS in class through planning and arranging learning activities. Studies emphasise that teachers' understanding of SPS is essential for improving the quality of science education (Harlen, 1999).

Teachers who are less grounded with SPS are a significant source of learners holding alternative/misconceptions on science concepts (Ball & McDonald, 1989; Keraro et al., 2004). However, science teachers must be proficient in SPS and possess strong knowledge, competencies, and understanding to teach the SPS effectively and meaningfully to learners (Settlage & Southerland, 2007; Chabalengula et al., 2012). Researchers found that science teachers' low understanding of SPS is very influential in students' SPS development process and a lack of science teachers' understanding of SPS affects effective science teaching and learning activities (Sukarno et al 2013). Teachers without an understanding of SPS in this study may hamper quality science education through learners' effective and meaningful science learning and may create learners' alternative/misconceptions on science concepts, which also encourages the teacher not to practice SPS in the primary science classrooms as the primary curriculum suggested.

Additionally, teachers should develop learners' SPS (Miles, 2010), and teachers' sufficient understanding of SPS helps their students to gain these skills at a desired level (Mutisya et al., 2013). But researchers found in their study that elementary school teachers did not have sufficient conceptual understanding of SPS (Türkmen and Kandemir, 2011; Ercan, 2007; Yilmaz & Meral-Kandemir, 2012; Işık and Nakipoğlu, 2011; Akar, 2007; Aydoğdu & Buldur, 2012; Laçin-Şimşek, 2010, Lotter et al. 2007; Chabalengula et al., 2012). Further, according to Kim (2007), learners' attitude towards science improves when teachers focus on learners' SPS through inquiry-based teaching. Some researchers have found that learners learn more and better science when taught by teachers who identify the relationship between science contents and processes through SPS (Novak & Gowin, 1983, Hipkins et al., 2002). The teacher in this study did not comprehend SPSs, which may prevent learners' achievement of SPS at the desired level and learners' positive attitude towards science; the teacher conducted science classes without properly focusing on science process skills, which does not help to promote scientific literacy. In addition, teachers should be able to evaluate learners' SPS, which is vital for students' achievement of SPS (Balfakih, 2010; Azizah et al., 2018). The teacher without an understanding of SPS in this study may not evaluate learners' SPS and learners' achievement of SPS.

Moreover, Shahali et al., (2017) identified that science education methods courses at primary teacher education institutions do not appear to be extremely helpful in raising the level of pre-service teachers' conceptual understanding of SPS. Thus, the mostly somewhat comprehended concerned stakeholders of this study from where teachers get training for professional development may not be helpful to primary science teachers and lead them to not practice SPS in the science classroom.

Implications of the findings of the study

The study found that the primary science teacher did not comprehend SPS. The study also found that the comprehension of supporting human resources and supporting curriculum documents may be reflected in teachers' comprehension and practices. These results then ultimately carry implications for primary science teaching practices in Bangladesh. Several implications are presented based on the findings and divided into three categories: knowledge, policy, and practice.

Implications for Knowledge Gap

The research findings imply the knowledge that is useful to almost all stakeholders. Moreover, researchers, policymakers, curriculum developers, and curriculum document developers may benefit from this knowledge. The knowledge of the findings provides a clear scenario in the literature for further research. The findings may help policymakers and science educators take necessary steps at the policy level to better comprehend curriculum documents. The curriculum developers and curriculum document developers can use this knowledge of the findings to develop or revise curriculum documents.

Implications for Policy

In Bangladesh, the findings of the study can be considered by MoPME, DPE, NCTB, and NAPE to make changes for improvement accordingly. The Ministry of Primary and Mass Education (MoPME) can take necessary steps to improve primary teachers' professional development by formulating policies. Policymakers can follow the research findings and take necessary policies for DPE to implement the necessary training for teachers' better comprehension. Policymakers can make necessary policies for NCTB so that NCTB can take into account the findings for teachers' better comprehension. Policymakers can take necessary steps for NAPE to innovate and develop new methods of teaching-learning for better and quality primary education, considering teachers' comprehension of science process skills.

Implications for Practice

The research findings suggest implications at the practice level where educators, teachers, and learners can benefit. Moreover, DPE, NAPE, PTI, URC, and school authorities can also use these findings in practice. All these institutions can be addressed or use the findings of the study to design and implement training programs and other programs related to teachers' professional development. DPE can take the necessary steps through training for teachers and concerned stakeholders. NCTB can consider the findings to develop educational materials: curriculum, curriculum documents, etc. for teachers' and concerned stakeholders' better comprehension. NAPE arranges necessary measures, considering the findings, such as training, seminars, and workshops for the academic staff of PTIs

and other field officials who are related to teachers' professional development. UEO, AUEO, Instructors of PTI, and URC may take into account the findings of the study for their professional development as the findings reveal that the concerned stakeholders who are engaged in teachers' training, monitoring, and supervision have somewhat comprehension of SPS. The school authority can take necessary steps for teachers' professional development by providing them the opportunity for proper training and proper classroom practice.

Conclusion

In the primary science teaching practice of Bangladesh, a teacher's comprehension of SPS is essential as it is considered a necessary tool for inquiry-based science teaching-learning. Teachers without an understanding of SPS may hamper inquiry-based primary science teaching practice and students' science learning. The concerned stakeholders having somewhat comprehension of SPS and the curriculum documents may prevent teachers' comprehension of SPS. The study hopes that, if the concerned stakeholders comprehend better, and if the concerned curriculum documents are properly addressed, then the teachers will comprehend better, and this will be reflected in teacher's classroom practice and students' science learning.

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Perception and Challenges of Primary School Head Teachers' Professional Development

Dr. Aparna Rani Dey

Abstract

The study explored the perception of primary school headteachers' professional development and challenges. A qualitative study was adopted to investigate the research where a purposive sampling technique was employed to select four (4) head teachers from a single district area of Bangladesh where two (2) professionals were male, and two (2) were female. The study revealed that primary school headteachers were concerned about their professional responsibilities though they faced different challenges. Selected headteachers disclosed that professional development depends on continuous professional development (CPD), collaboration with colleagues and related stakeholders, material and social rewards, respect and democratic leadership. They identified different factors like the burden of administrative responsibilities, scarcity of digital documentation, disparities within an educational environment, societal misconception about primary education and lack of material and social rewards which affect professional development. The study also identified gender-biased social attitudes towards female headteachers. The headteachers explained that to enhance professional development need to ensure the appointment of dedicated qualified teachers, secure financial status along with job satisfaction, enroll accountable and strengthen SMC, and positive changes in social attitude.

The study highlights the importance of policy, training, awareness, resources, advocacy, and positive participation in professional development for primary school headteachers in Bangladesh, aiming for better outcomes.

Keywords: Primary education, Headteacher, Professional development

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Introduction

The professional integrity of the teacher enhances teachers' personalities and motivates them to achieve better professional skills (Burke, 1996). Teachers, particularly engaged at the primary level of education, are dedicated to generating and implementing decisions that affect the nation's future generation and promote the welfare of a country. Different research proved that quality primary education depends on the professional development of primary school headteachers, and the teaching-learning quality of the school depends on the leadership capacity of the headteachers (De Grauwe, 2000, quoted in Simkins et al., 2003).

Professional development is the prime condition for ensuring quality primary education. Because professional development prepares the headteachers to contribute and enhance their ability to overcome different challenges (Balyer, Karatas, & Alci, 2015; Valli, Stefanski, & Jacobson, 2014; Vélez, Lorenzo, & Garrido, 2017).

The primary education system of Bangladesh is one of the largest education systems in the world (Das, Asim., Kusakabe, Tatsuya., & Dey, Aparna. Rani. 2019), and primary school teachers' professional development is one of the emphasized areas of education in Bangladesh (MoE, 2010). The 8th five-year plan (July 2020-June 2025) and the perspective plan 2021-2041 also consider investing in primary education (General economic division, 2020).

Statement of the Problem

At present, primary education in Bangladesh is influenced by different related factors like economic advancement and different challenges, updated information and communication technologies and policy integration. The influence of these factors in the primary education environment had to adapt to different changes and ensure efficient adjustment of primary school headteachers as a professional expert. Primary school headteachers are responsible for establishing, monitoring and maintaining quality primary education. To achieve the goal of primary education, head teachers need readiness, which is only possible through professional development. This paper aims to explore primary school headteachers' perceptions of professional development and identify the challenges experienced by primary headteachers in leading professional development initiatives within their schools.

Significance of the Study

Understanding primary school headteachers' perceptions of professional development holds significant implications for enhancing educational quality and optimizing leadership capacities. By delving into the challenges experienced by headteachers in leading professional development initiatives within their schools, this study seeks to inform targeted interventions that can address these obstacles

effectively. Through tailored support and training opportunities, headteachers can be better equipped to navigate the complexities of their roles and lead their schools towards excellence in teaching and learning outcomes.

Moreover, the findings of this study have the potential to inform educational policies and practices, both at the national and local levels. By gaining insights into the specific challenges primary school headteachers face, policymakers can tailor policies and programs to meet the evolving needs of school leaders effectively. Additionally, practitioners in the field of education can utilize these findings to develop evidence-based strategies for improving professional development practices in primary schools. Ultimately, by empowering headteachers with the knowledge and resources they need for professional development, this study aims to foster a culture of continuous improvement and innovation within primary education, thereby benefiting the students and communities they serve.

Purpose of the Study and Research Question

The purpose of the study is to explore the perceptions of primary school headteachers about their professional development. The study also aims to identify the challenges that primary school headteachers experience while implementing leading professional activities.

The research will be guided by two specific research questions:

1. What are the perceptions of primary school head teachers about professional development?
2. What are the challenges experienced by primary headteachers in leading professional development initiatives within their schools?

Literature Review

The concept of profession demands two individual perceptions when applied to teaching (Hargreaves, 2000). Firstly, the profession considers the ability of the professionals they exercise, and secondly, teachers' social and professional status, which implies professional reward. Teacher training offers chances for teachers to discover new roles, develop fresh teaching methods, improve their skills, and grow both professionally and personally (Komba & Nkumbi, 2008). Additionally, Ahmad, Rashid, and Ali (2023) describe professional development as ongoing training and education throughout one's career to enhance the skills and knowledge needed for a job or set of tasks. However, research suggests that the relationship between teachers' professional development and classroom practices is more complex than it may seem (Villegas-Reimers, 2003).

Primary school headteachers in Bangladesh are regarded as an influential and respected community within the education system due to their professional

identity and leadership quality. Effective leadership is the attribute which inspires related stakeholders to get engaged and achieve the ultimate goal (Pant, 2022).

To fulfil the purpose of the research the 'actor-based' model disclosed by Burrage (1990) has been selected to follow the theoretical guideline for the primary school teachers' professional development. Though it may be criticized for its understanding and interpretation of the features from the perspective of a developing country, the purpose of the research was to lubricate its further development.

The model identified four (4) prime actors that are identified (state, training institution, professional organization and user which are responsible for determining the achievement or failure of the professional development. These four actors are indispensably related to the professionals and are also useful in exploring different critical stages of professional development (ibib, p.207). The framework provides the opportunity to explore how primary school head teachers in Bangladesh enhance professional development and encounter related challenges.

Figure 1: Actor-based model for professional development.

Burrage indicated that the state is the prime actor in the process of professional development, which involves different instruments to ensure output. The fact is that every aspect of professional development is strongly connected directly or indirectly. Different professionals' existence, training, permission, and professional relations create a market (create different demands for education, ensure supply and other) for related services. The ability, materials, resources, and

status of a profession depend exceedingly on the policies of the state (Burrrage, 1990: p. 210).

Training institutions are another powerful indicator of an actor-based model. The institutions which were deliberately dedicated to creating knowledge ensure a source of knowledge for professionals. The status of a profession depends on the degrees provided by different related institutions that measure the achievement of professionals. Burrage (ibid, 1990) mentioned that several factors could contribute to higher social respect in society based on professionals' competence, vocational, ethical and social status. Dove, (1986, p. 20) explained that status is a very important and an inseparable aspect of social life.

Burrage mentioned that professional organizations are the central actors of development. A variety of organizations flourished on different educational needs which provide different activities related to different knowledge and interests. Practitioners also maintain professional autonomy and ideology.

Burrage (1990) explored users as an integral part of professional development. Most of the cases are the professional 'free-for-service' consumers and they are the core element of institutions. Users can reward or motivate professional organizations by using their resources like publicity, fees, selection etc. which help to ensure the standard of professional organizations.

The professional development of primary school headteachers in Bangladesh can strongly be related to Burreg's actor-based development model. The different actors of the model can relate to the different development phases of primary professionals, where their success or variety of achievements are also involved in development. Discussion and analysis of the study followed the following framework-

Figure 2: Discussion and analysis framework of the study

Methodology

Two research questions of this study dealt with the perception of primary headteachers about their professional development and the challenges they faced, which are the two areas emphasized in this study. A qualitative inquiry was involved in exploring the central phenomena of the study as Creswell and Creswell (2017) explained that qualitative research is the most relevant way to develop and explore a detailed investigation to explain the emphasized areas of a study. Patton (2002) argues that qualitative study is a naturalistic inquiry that ensures analysis of the real situation without interruption as it explores naturally. Patton (2002, p.230) also implies that "Qualitative inquiry typically focuses in-depth on relatively small samples."

Four headteachers from government primary schools were purposefully selected from a single district in Bangladesh as it was also convenient to get the data. The sampling technique ensured gender balance, with two male and two female professionals chosen through purposeful sampling. A semi-structured in-depth interview was conducted to utilize the qualitative study. Data was analyzed by using a thematic analysis process as Clarke and Braun (2014) explained that thematic analysis explores and identifies the themes that are significant to analyze qualitative data. Qualitative data was categorized by using codes to ensure ethical consideration of the study (four headteachers were mentioned as F1, F2, M1 and M2).

Findings and Discussion

The interview data was analyzed thematically, and five major themes emerged. The findings on those themes are discussed below:

Theme 1: Current Perceptions of Professional Development

Participants had different understandings of professional development terms. M1, first respondent, emphasized the importance of professionalism within the teaching profession and the need for continuous professional development (CPD) to update knowledge. He further stated, "Many teachers, including headteachers (HT), lack motivation and that teaching is not an attractive profession due to societal factors such as lack of recognition and financial support."

Another participant, F1, focused on the importance of time management for both students and teachers as a key aspect of professional development. She also highlighted the significance of engaging students in co-curricular activities and creating an attractive environment in schools to enhance professional development.

The fourth head teacher, F2, identified digital documentation challenges as an important factor for head teachers, highlighting external factors such as slow servers and limited time leading to delayed input. She also shared her experience

in the form of gender-related discrimination from a social perspective but received support from official authorities and colleagues, indicating perceptions of support and challenges in leadership roles.

All four participants emphasize the importance of professional development in enhancing the quality of education. They acknowledge the need for continuous learning and updating of skills to meet the evolving needs of students and the educational landscape which is similar to the findings of Shulman and Shulman (2009) where they found that teachers' inclination to acquire knowledge is an essential prerequisite for the enhancement of their teaching abilities and triumphant growth in their professional career.

National Curriculum Outline 2021 included Invariant Focus which emphasized different features of development, corresponded with headteachers professional development-

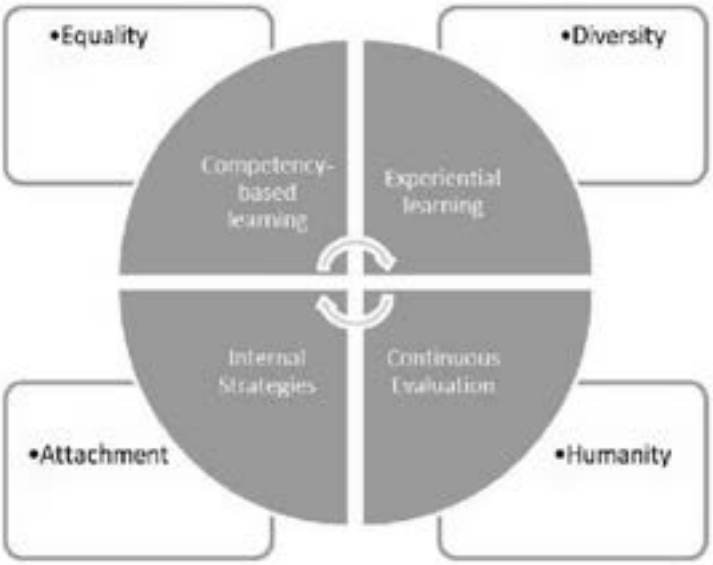

Figure 3: Invariant focus for development (Source: NCTB, 2021)

Practices of transformational leadership strengthen the professional development and motivation of teachers, thereby enhancing the conditions of the school organization (Thoonen, Sleegers, Oort, Peetsma and Geijsel, 2011). While all participants recognize the importance of professional development, their perceptions highlight various systemic challenges and disparities within the educational environment. M1 focused on the lack of motivation and societal recognition within the teaching profession, while F1 highlighted challenges in

organizational support and resistance to change. These include issues related to motivation, organizational support, and gender discrimination. Addressing these challenges is crucial for creating a conducive environment for effective professional development initiatives.

Theme 2: Existing Practices in Professional Development

M2, the second headteacher, mentioned the division of duties among teachers by the HT through private and open meetings, suggesting some existing practices in managing professional development within schools. He also said that collaboration between teachers was important for success, and there should be an emphasis on creating a work environment that attracts individuals to the teaching profession. Similarly, F1 identified Collaboration between parents and teachers as an important aspect of professional development, suggesting an existing practice of involving parents in school activities. She also mentioned challenges in getting full support from assistant teachers and unity in organizing functions, indicating existing difficulties in implementing professional development initiatives due to organizational issues.

However, F2 said that she got full support from her colleagues. She stated, "I get total support from assistant teachers, particularly noting that they are all female, which helps in better understanding each other and facing everyday challenges." She also emphasized the importance of creating good relationships through leadership, which facilitates school development.

Notably, M2 and F1 emphasized the importance of collaboration and mutual respect among teachers for success. F2 also highlights the support received from assistant teachers, indicating existing practices of teamwork and support within the school community. On the other hand, M2 mentioned the division of duties among teachers by the head teacher, while F1 discussed parental involvement in school activities.

Collaboration among teachers and support from colleagues emerge as common themes among participants, indicating existing positive practices within schools. This is seen as the beneficiary for all forms of teacher professional development (Richter, Fütterer, Meyer, Eisenkraft and Fischer, 2022). However, challenges such as lack of parental involvement and unclear division of duties underscore the need for further improvement and standardization of practices.

Challenges related to parental involvement, societal misconceptions, and organizational support are prevalent across all participants' responses. Addressing these challenges requires collaborative efforts from stakeholders and systemic changes within the educational system.

Theme 3: Collaboration and Communication in Professional Development

M1 highlighted that collaboration and mutual respect among teachers are important factors for success, suggesting a recognition of the importance of collaboration in professional development initiatives. On the other hand, collaboration between parents and teachers is identified by F1 as essential for professional development, indicating the importance of effective communication and partnership between stakeholders. F2 responded by emphasizing collaboration between teachers, "Collaboration and support from colleagues and assistant teachers are highlighted as important factors in professional development leadership, indicating existing practices of teamwork and mutual support within the school community."

All participants emphasized the importance of collaboration and communication among teachers and stakeholders for successful professional development initiatives. However, M1 discussed the division of duties among teachers by the head teacher, while F1 mentioned collaboration between parents and teachers.

From the opinions of the teachers, it is evident that collaboration and communication are two major critical factors for effective professional development. However, inconsistencies in organizational practices and parental involvement indicate areas for improvement in fostering collaborative environments within schools. Payne (2008) in this regard stated that successful relationships happen when emotional deposits are made to clients or employees, emotional withdrawals are avoided, and clients or employees are respected.

Theme 4: Challenges Faced in Professional Development Leadership

M1 identified several challenges, including the lack of motivation among teachers, resistance to change, and a perception of teaching as a second job rather than a primary profession. Also, M2 mentioned societal misconceptions about the need for educated teachers, leading to the presence of low-quality teachers in primary education settings. He further implied that the role of School Management Committees (SMCs) is getting limited as their dedication and efficacy seemed not as worthy as before. F2 said in this regard, "At times, SMC is not supportive in school development efforts, focusing more on monitoring and supervision rather than providing constructive support."

F1 said that the diverse demographics and mentality of parents, make it difficult to achieve consensus and collaboration among stakeholders. She added, "There is also a need to address misconceptions among stakeholders and emphasize that decisions are made in the best interest of students, indicating challenges related to communication and stakeholder management."

Moreover, F2 mentioned parents' lack of awareness about their children's classes, indicating a need for increased parental involvement and communication. School

administrators and educators ought to furnish resources or services to parents, aiding in bolstering family support and fostering a stronger connection between home and school. (Gore, Thomas, Jones, Mahoney, Duke, and Treadway, 2016).

In this discussion, two participants discussed resistance to change and lack of motivation among teachers, while F1 mentioned challenges in getting full support from assistant teachers. Similarly, F2 highlighted digital documentation challenges and gender-related discrimination.

School leadership in Bangladesh is a complex and challenging phenomenon where it is difficult to draw a confirmed conclusion. The findings of the study explored that headteachers' professional development plays the most significant role in command schools for success.

Theme 5: Desired Changes and Improvements

The respondents suggested the need for a more democratic leadership style among HTs and emphasized the importance of positively motivating teachers. They asked for recognition of work, even through verbal acknowledgement, and a call for societal recognition of the teaching profession.

F1 desired changes include developing a professional attitude among teachers, providing financial support to enhance teacher performance, and decentralizing job responsibilities of headteachers to improve efficiency and effectiveness. She also suggested technological support such as multimedia classrooms and monitoring through CCTV cameras as potential improvements to professional development initiatives.

Another female head teacher, F2, implied changes include increased support from parents, more proactive involvement of the SMC in teacher training and school development, and additional training opportunities for teachers. The respondent also suggested the establishment of a dedicated room for digital classrooms to address challenges related to digital teaching methods.

Participants expressed a desire for increased support from parents, enhanced involvement of SMCs in teacher training and school development, and additional training opportunities for teachers. However, while some emphasized the need for a more democratic leadership style, others mentioned technological support for digital classrooms.

In this theme, desired changes and improvements were aligned with the identified challenges, emphasizing the importance of addressing systemic issues such as parental involvement, organizational support, and technological infrastructure to enhance professional development initiatives within schools. Educators can support parents by organizing workshops and training sessions aimed at enhancing effective methods to foster student learning. Schools fostering collaborative partnerships with parents have demonstrated efficacy, attributing

their success to the provision of workshops aimed at aiding parental involvement (Caudle, Bayan, Harrington, & Barnes, 2012).

The study identified that primary school headteachers' professional development is significant in two major areas: professional development for school leadership and professional development for effectiveness. The study identified the standard of professional development (inspired by the actor-based model and findings of the study) which will contribute to creating an in-depth insight into the primary school headteachers' professional development.

Area of Performance	**Standards**	**Professional Development Indicators**
State (permission, policy)	He/she must be well informed about the policy, and legal requirements related to the school.	Ensure the application of rules and regulations of the school. Obey the law relating to the school administration, and ministerial instruction.
Training Institutions (Create knowledge, Degree)	Headteachers will be able to know the modern pedagogical methods and goals of education. He/she can lead teaching and promote modern teaching-learning activities to ensure quality education.	The headteacher ensures the application of modern pedagogy. Implement the goal of education following the philosophical foundation of education.
Professional Organization (Different knowledge, different interests, different educational needs etc)	Foster a positive and safe environment, ensure professional relationships, share responsibilities, and build up good communication.	Ensure the professional environment stimulates stakeholders. Ensure student achievement, and teacher-student active participation, and create new demand for education.
User (Motivate and ensure the standard of organizations)	Self-evaluation, awareness of the social changes, and plan for professional and institutional development.	Encourage teachers to self-evaluate, share different experiences, establish the school, and build capacity for professional development and recognition.

Table 1: Standard of Professional Development

Conclusion and Implications

The study provides insights regarding the perception of professional development and challenges in leading professional development initiatives within their schools. The role of primary school head teachers is multi-dimensional. School leaders are always under pressure, experiencing a lack of resources along with professional accountability. The study explored that primary school head teachers' professional development in Bangladesh is a challenging process along with a lot of opportunities.

The findings and discussion of the study have identified the following implications which may help to develop the professional environment and create a better path for professional development.

The study's findings and subsequent discussion offer insightful implications aimed at cultivating a conducive professional environment and facilitating effective professional development pathways. Firstly, schools are encouraged to cultivate a culture of collaboration and mutual support among teachers and stakeholders. By fostering such an environment, schools can effectively enhance professional development initiatives, fostering continuous learning and growth among educators.

Secondly, school leadership and management play a pivotal role in prioritizing support, resources, and training opportunities. Addressing challenges related to parental involvement, gender discrimination, and technological infrastructure requires proactive measures from school administrators. By prioritizing these areas and providing adequate support, schools can create an enabling environment for effective professional development.

Lastly, efforts should be directed towards raising awareness and advocating for the importance of professional development. Educating stakeholders about the significant impact of professional development on educational outcomes is crucial. Additionally, addressing societal misconceptions and fostering a positive perception of the teaching profession can further enhance the uptake and effectiveness of professional development initiatives.

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Group Work in Primary Science Classes: Teachers' Knowledge, Attitude and Practice

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Abstract

The National Curriculum Framework (2021), considers group work as an essential strategy for teaching-learning and assessment. This study provides insight into Bangladeshi primary school teachers' preparedness to use group work in science classes. A multiple case study framework was adopted here. As the research questions demanded both qualitative and quantitative data, a sequential exploratory mixed-method research design was followed. Six primary school science teachers from rural and urban areas were selected through maximal variation sampling. A lesson observation schedule and a semi-structured interview were used to gather the qualitative data. Quantitative data was collected through a Likert scale questionnaire. Data for the rural and urban cases were analyzed through thematic and descriptive analysis. Overall findings were then drawn. The current practice of group work in rural and urban contexts is somewhat similar. This study claims that primary science teachers in Bangladesh have adequate knowledge to plan and conduct group work and their attitude towards this teaching strategy is positive. However, more training and information regarding group formation, keeping the discussions student-centred and assessing group work is required to improve teachers' practice of group work. The findings of this study have implications for primary teacher educators and teachers in addressing the challenges.

Keywords: Primary science, Group work, Ttacher.

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Introduction

According to Goodrum (2004), students learn more effectively when they work cooperatively than when they work individually or competitively. Teamwork is so important that the Organization for Economic Co-operation and Development (OECD) regarded learning to cooperate as one of the major competencies that any person in the twenty-first century should possess (Martinez-Farnandez et al., 2011).

Students demonstrate better achievement, socialization, motivation and self-development while working with peers than working individually. There is plenty of evidence that cooperative learning as a pedagogical practice has an immense effect on student learning and socialization in science programs (Slavin, 2014). However, research by King, 2002 (as cited in Gillies, 2016) indicates that students rarely provide quality explanations or engage in high-level discourse unless they are taught to do so.

Teachers play a vital role in the success of students' cooperation and their achievement. Despite being an effective teaching strategy, research by Frykedal and Chiriac (2012) found that several teachers in some developed countries are reluctant to use group work as a pedagogical tool in the classroom. Therefore, it is important to explore Bangladeshi teachers' knowledge, attitude and practice of group work in science classes to understand the nature and challenges of using group work at the primary level.

Problem Statement

Although students play a major role in learning in group work, we can only expect the groups to function properly with proper guidance. To ensure that the teachers can efficiently practice this strategy in classrooms, Bangladesh has been providing training to the teachers on learner-centred teaching methods. A model for the teacher's role in facilitating group work (Rahman, 2018) has been included in different teachers' training programs to improve teacher's practice of group work in the classroom. However, research has yet to be conducted so far on teachers' practice of group work, focusing on this model.

Besides structuring the groups in a way that facilitates cooperation among students, teachers also have a role in promoting interactions among the students. However, previous research by Mony (2017) and Tuli et al. (2021) indicates that primary school teachers in Bangladesh need more pedagogical knowledge to manage group work in science classes. They face challenges, especially in forming groups, ensuring equal participation of students and assessing students' achievement. Although group work is emphasized as an important teaching strategy in the National Education Policy of Bangladesh (2010), these studies suggest that teachers are struggling to implement group work properly.

Previous research on learning in group work in the Bangladeshi context was done by exploring students' perceptions of learning in small groups in higher education (Rahman et al., 2010). Several recent researches focused on the nature of group work practice at the tertiary level (Hasnat, 2016) and the factors influencing the practice of group work in secondary schools (Jahan, 2019). To the best of my knowledge, research has yet to be conducted on the teachers' knowledge, attitudes, and practice of group work at the primary level in Bangladesh. This research will fill the gap in the existing literature by providing detailed information regarding primary school teachers' knowledge, attitudes, and practice of group work.

Purpose of the Study

The purpose of this study is to explore primary school teachers' knowledge, attitudes, and practices in group work and discover the challenges they face. Possible ways out will be identified for better implementing this strategy in Bangladeshi science classes.

Research Question

This study aims to find out answers to the following research questions.

1. What is primary science teachers' knowledge about facilitating group work?
2. What sort of attitude is presented by the primary school teachers towards using group work in science classes?
3. How is group work being practiced by the teachers in primary science classrooms?

Theoretical Framework

Group work is one of the teaching strategies that have been devised to implement the social constructivist principles of learning in the classroom. It has been described by different scholars differently over time. Johnson and Johnson (1990) explain that group work is small groups of students working together to enhance their learning and that of their team members. Salend (1994 as cited in Adamseged, 2015) describes cooperative learning 'as an organized strategy, in which students work for a common academic goal rather than competing or working separately from their peers.'

Working in groups enables students to learn content better as well as develop social skills. Some benefits of learning in groups mentioned by Goodrum (2004) are as follows:

- More effective learning
- Improved self-confidence
- Better class management
- Teaching students how to work cooperatively

As discussed earlier, Bangladesh is trying to upgrade its science teaching-learning strategies to cope with global trends. However, the successful implementation of these changes vastly depends on the attitude of the major education stakeholders in the country, such as teachers and students. Tao (2015), Aadamseged (2015), and Rahman (2021) have found teachers highly positive and motivated towards using group work in their classrooms. They recognized the significance of applying this strategy to the achievement of their students. However, studies by Jahan (2019), Tuli et al. (2022) and Gillies and Boyle (2009) have found unwillingness to apply for the group work among the participants of their respective research.

Model of Teacher's Role in Facilitating Group Work

A model of teachers' role in facilitating group work was developed by Dr. S. M. Hafizur Rahman, Professor of the Institute of Education and Research (IER), University of Dhaka, to provide a guideline for the science teachers on the implementation of group work. Mony (2017), a student with an M.Ed at IER, researched the validation of this model in primary schools in Bangladesh and found positive results. Later on, this model was included in the Teachers' Training Program (Rahman, 2018). This model identifies teachers' roles during group work, which makes it easier for the teachers to plan and conduct lessons using this strategy. The roles of teachers mentioned in the model were the basis of the data collection instruments and data analysis for this study. The following figure represents the roles of a teacher identified in the model of a teacher's role in facilitating group work.

Model for Teacher's Role in Facilitating Group Work
Group Formation
Group Task
Group Instruction
Tracking Group Activity
Checking Group Progress
Group Presentation
Cross-Checking and Developing Summary
Concept Development
Assessment

Figure. Model of teacher's role in facilitating group work

Methodology

This study followed a multiple-case study framework. A multiple case study enables the researcher to generalize the results (Creswell, 2008). This study followed a mixed-method research design. Research questions one and three demanded an exploration of central phenomena (teachers' knowledge and practice) and the second research question aimed to describe teachers' attitudes towards group work.

Focus of Research Question	Findings for Rural Teachers	Findings for Urban Teachers	Overall Findings
1. Knowledge	1. Most teachers have adequate knowledge about facilitating group work 2. Inadequate knowledge about Giving Instruction	1. Most teachers have adequate knowledge about facilitating group work 2. Inadequate knowledge about Checking Progress	1. Most of the primary science teachers have adequate knowledge about planning and conducting group work 2. Inadequate knowledge about a few parts
2. Attitude	1. Moderately positive 2. Group work is effective for teaching science 3. Cannot be applied widely in Bangladesh 4. There is a positive relation between teacher's attitude and practice	1. Highly positive 2. Group work is effective for teaching science 3. Cannot be applied widely in Bangladesh 4. There is a negative relation between teacher's attitude and practice	1. Teachers have shown a positive attitude towards group work 2. Group work is an effective way to enhance learning and skills

3. Practice	1. Most of the roles mentioned in the model (Rahman, 2018) were practiced well by the majority of the teachers. 2. Faced problems in Group Formation Tracking Group Work Cross-checking Concept Development Assessment	1. Most of the roles mentioned in the model (Rahman, 2018) were practiced well by the majority of the teachers. 2. Faced problems in Group Formation Cross-checking Concept Development Assessment	1. Teachers face difficulties in forming heterogeneous groups 2. Teachers need more training on keeping the discussion student-centered 3. Group work is practiced less in the rural areas 4. Problem in Class Management 5. No specific strategy for Assessment

In this study, twelve lessons from six teachers were observed in the first phase, followed by a semi-structured interview. Later on, a questionnaire was administered. Lessons were observed first, then an interview was conducted, and a questionnaire was given to the participants at the end to ensure that the teacher's practice and knowledge were not influenced by the items set in the questionnaire. The weight or priority is given to the qualitative approach here, which is in line with the sequential exploratory model (Creswell, 2008).

Data for this study was collected from six primary school science teachers. These participants were selected from rural (Jamalpur district) and urban (Dhaka district) areas through maximal variation sampling to ensure the inclusion of participants of different genders, educational backgrounds, and training received. Two lessons of each teacher in which they used group work were observed purposively to understand teachers' practice of group work (Johnson & Christensen, 2014).

The instruments for data collection were a semi-structured interview, a lesson observation schedule and a questionnaire. All three were prepared based on the teacher role mentioned in the 'Model for the Teachers to Facilitate Group Work' (Rahman, 2018). The content validity of both instruments was determined through pilot testing. Cronbach's Alpha Coefficient for the questionnaire of the study is 0.76, which means the instrument was reliable.

Thematic analysis was used to identify and analyze patterns of meaning or theme in qualitative data (Clarke and Braun, 2013). For analyzing data, the roles mentioned in the 'Model for the Teachers' Role to Facilitate Group Work' (Rahman, 2018) were used as predetermined themes, to ensure privacy, pseudo

names were used for the participants (R1, R2 and R3 for the rural teachers and U1, U2 and U3 for the urban teachers). Descriptive analysis was used for the quantitative part of the study.

Results

Thematic analysis of data for rural and urban cases was performed individually. Then, a cross-case analysis was made to draw the overall findings of this study. This section provides the overall findings under each research question to identify ways to reduce teacher struggle and ensure better implementation of group work in primary science classes in Bangladesh.

Teachers' Knowledge of Group Work

Table- Participant teachers' knowledge of group work

Participants	R1	R2	R3	U1	U2	U3
Knowledge	Inadequate knowledge about the assessment process and providing feedback	Adequate knowledge of all steps	Adequate knowledge of giving instruction	Inadequate knowledge of giving feedback	Adequate knowledge of all steps	Adequate knowledge of all steps

The table above indicates that the participant teachers have adequate knowledge about most of the roles they have to play during group work. They are expected to be able to plan a lesson using group work properly.

U1, in the interview, mentioned, 'I think I should not interfere during their discussion and let the students work independently. I usually give feedback after the presentation.' R2 doesn't find it necessary to give individual instruction to each group. He believes that general instruction is enough for the groups to understand the task. This shows his need for knowledge about how to provide feedback and check the progress of group work. Interview data reveals that a few teachers need more knowledge regarding a few roles of facilitating group work, such as giving individual instruction, providing feedback and the assessment process of group work. R1 said in the interview,' I assess the student's achievement of learning outcome at the end of the lesson.' He does not assess students' participation and contribution to the group's work. More information regarding these processes needs to be shared with the teachers.

Teachers' Attitude towards Group Work

Table- Participant teacher's attitude towards group work

Participant	R1	R2	R3	U1	U2	U3
Mean Score	3.9	3.76.	4.75	4.24	4.43	4.02
Attitude	Positive	Positive	Positive	Positive	Positive	Positive

Teachers have exhibited a positive attitude towards group work. It is expected that teachers will apply this strategy in their classes. They believe this strategy helps enhance students' knowledge and social skills. According to R3, ' Group work can be an effective way for teaching science. Students joyfully learn the topic and it also enhances their social and science process skills.' Interview data also suggests that challenges like large class sizes, time constraints, and teacher workload might demotivate them from using this strategy in class. These challenges echoed in U2's statement. 'A large number of students makes it difficult to apply for group work in our schools. Also, the lesson time is too short to complete.'

Teachers' Practice of Group Work

Teachers struggle to form heterogeneous groups mostly because of the large class size and the congested seating arrangements. No consideration of students' learning ability, gender or personality traits was observed in any lessons. However, one participant had decided on the groups earlier. It was observed that U1 had already sorted out students based on their gender and learning abilities. Therefore, whenever he conducts group work, students can quickly get up and sit with their group members.

Sometimes, it becomes challenging to complete the lesson within the given time. Due to time constraints, teachers often need help practicing cross-checking groups' findings and assessing students properly.

Teachers do not follow any specific strategy for assessing students' knowledge and skills. Observation data reveals that participant U2 asked a few oral questions to assess students' progress and learning. It was also observed that a few of the participants skipped the assessment part completely.

Teachers need to gain the skills to conduct student-centred discussions. It was observed that only two teachers (U1 and R3) managed to draw a summary through student-centred discussions. Co-construction of knowledge is often absent in the classes.

Group work is less practiced in rural areas. As a result, students in rural areas have difficulty understanding the process of working in groups and learning the concepts.

Discussion

Teachers' Knowledge of Group Work

Teachers have adequate knowledge about planning and conducting group work

As evident from the interview data, primary school science teachers in Bangladesh have adequate knowledge about facilitating group work. Most of the teachers in both rural and urban areas know how to plan and conduct the lessons using group work. Various research studies (OECD, 2017; Khalid et al. 2021) have found a positive connection between teachers' knowledge of teaching strategies and students' achievement. As the teachers of Bangladesh have adequate knowledge about group work, it is expected that they will be able to implement it in their classrooms effectively, which will enhance their students' achievements.

Inadequate knowledge about a few roles

Though most of the participants of this study have adequate knowledge about conducting group work, some of the teachers in both urban and rural areas need clarification about a few roles (Karmina, 2021). Tan (2015) claims that with clear instruction and constant guidance from teachers, groups can function effectively and attain the desired cognitive and social skills. A lack of teachers' knowledge about the importance of providing feedback and giving individual instructions might result in students' failure to acquire the intended knowledge and social skills. Karmina (2021) found that teachers' need for more understanding of group work resulted in their difficulty in implementing this strategy. For the better implementation of group work, Bangladeshi teachers must be made aware of the importance of teachers' roles during cooperative learning through training.

Teachers' Attitude towards group work

Teachers have shown a positive attitude towards group work

All the teachers have shown a positive attitude towards group work. All of them consider this as an effective strategy for teaching science. This result is consistent with the findings of Adamseged (2015), where the primary school teachers of Addis Ababa had shown a positive attitude towards learning in small groups. Adamseged (2015) also argues that the impact of implementing different strategies in the classroom relies mostly on the attitude of the major stakeholders (Teachers and Students). Therefore, teachers with a positive attitude towards group work will be able to implement the strategy successfully in their lessons when the other challenges are met.

Group work is an effective way to enhance learning and skills

Participants of this research agreed that group work is more student-centered and improves social and science process skills in students, such as critical thinking, communicating, being respectful and making informed decisions. Research findings of Johnson & Johnson (1999, as cited in Rahman et al., 2010) also suggest the same. Adamseged (2010) stated that the attitude of a person can shape how that person thinks, feels, understands and behaves. As the teachers think that cooperative learning has a significant impact on student achievement, this attitude will help them to facilitate students' learning through the use of group work; when necessary, knowledge and skills to operate group work is provided to them.

Practice of Group Work in Science Classes

Teachers face difficulties in forming heterogeneous groups

In both rural and urban schools, the participant teachers found it challenging to form heterogeneous groups by considering individual students' learning abilities and personalities, as there were more than forty students in the class. They opted to form the groups according to the students' seating arrangement. Tan (2015) reported similar findings in his study. In heterogeneous groups, students of different abilities work together, and both benefit from it as peer assistance comes naturally (Adamseged, 2015). The teachers in the interview accepted that there are better techniques than forming groups based on seating arrangements, which shows that they know about forming groups. However, due to time constraints, they cannot form heterogeneous groups.

Teachers need more information about the group formation process as it is vital for the successful implementation of group work. One of the participant teachers had set the groups previously and whenever he practices group work in class, students can quickly form the groups in no time. This can be a good idea. However, working with the same group members might limit their opportunity to meet more of their peers and hamper the development of their social skills. Therefore, Kagan and Kagan (2007) suggest that all four types of grouping strategies (random, heterogeneous, homogeneous and student-selected) can be used throughout the school year. The idea of predetermined grouping and using different types of group formation can resolve the issue of group formation in large classes.

Teachers need more training on keeping the discussion student-centered

Most of the students spontaneously discussed the topic with their group members. Teachers monitored their work and provided feedback. When it comes to the concept development role, teachers fail to keep the discussion student-centered. This finding is in line with the findings of Tan (2015), where the practice of 75% of the participant teachers' (China) teaching modes was mainly traditional

teaching even though they were applying for group work. Gillies and Boyle, 2009) also found, 'Grouping practices were aimed at maintaining control and on-task attention and maximizing individual and teacher-directed learning.'

In both urban and rural areas, the teachers know group work; however, they do not understand the essence of cooperative learning. Teachers lack the skills to scaffold students' learning. As a result, co-construction of knowledge through the discussion between teacher and students, which is the main theme of group work, was absent in most of the classes. Training teachers with the required skills of facilitating the discussions is required (Lopata et al.,2003; Gillies, 2008 and Karmina et al. 2021).

Group work is practiced less in the rural areas

Most rural teachers mention that their students need to be used to this learning strategy, as group work is not very common in rural schools. Therefore, students need help maintaining group norms and completing the task. Tan (2015) mentioned, 'Influenced by the traditional idea, students pay more attention to the competition between them. They don't realize the benefits that cooperative learning brings to them, so they don't learn cooperative learning skills actively.'

This research found that students in rural areas face difficulty in understanding the group learning process as they are not familiar with this kind of learning. As a result, rural teachers find it challenging to conduct group work in class. However, Gillies and Boyle (2009) suggest that teachers should train the students on interpersonal skills and prepare them for their small-group experience before assigning the task. This will help students to understand their role and it will be easier on the teacher's end to conduct the class as well.

No specific strategy for Assessment

As evident from the observation and interview data, primary school teachers in Bangladesh still need to have a structured manner of assessing students' achievements through group work. No use of a specific or structured format of assessment was observed, which can be used further to evaluate students' progress. Previous research by Talukder et al. (2021) found a need for more information about the assessment process associated with different teaching strategies in the training program in Bangladesh. According to Forsell et al. (2021), '...teachers need better management strategies for high-quality group work assessment that takes validity, fairness, and reliability into consideration.'

Therefore, it can be concluded that Bangladeshi teachers need more information and training about the assessment process. Otherwise, the implementation of group work will not be fruitful for the student's progress.

Implications

The findings of this study can benefit different stakeholders in primary science education in Bangladesh. Implications of the study are mentioned below.

- The major findings of this research suggest that teachers are not forming the groups properly due to time constraints. They can use the predetermined grouping idea mentioned in this study.
- Another suggestion is that the teachers explore different strategies to make the task more interesting.
- Several findings indicated the need for teachers to be trained regarding the implementation process of group work. Teachers' training programs in Bangladesh need to provide teachers with the proper guidelines on group formation, teachers' roles and assessment strategies associated with group work.
- One of the findings of this research indicates that group work is not very common in rural areas. Further research is suggested to explore this concept.
- Teachers' perspectives about group work were focused in this research. New research can be done to explore students' perspectives on the strategy.

Conclusion

This study provides an insight into the knowledge and attitude of the primary school science teachers of Bangladesh. It gives us a glimpse of the current practice of this strategy in our science classrooms. Although the teachers have adequate knowledge about this teaching strategy and consider it an effective way of teaching science and making the children socially responsible, they need help finding it in Bangladesh's schools due to some challenges.

To make our students ready for the challenges of the twenty-first century, we need to bring about a change in our traditional teaching-learning strategies. Group work is an excellent way of providing academic knowledge as well as social skills to the students. It is reassuring to see that despite having many challenges, the teachers of Bangladesh are still trying to practice this strategy in their classrooms. However, proper planning, identifying the teacher's and student's roles and appropriate assessment of students' achievement are all crucial to achieving the complete benefit of applying this strategy.

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Investigating Factors Influencing the Students' Performance in Government Primary Schools

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Abstract

This study examines different factors that influence the academic performance of grade three students in government primary schools (GPS) in Bangladesh. The goals were to evaluate the levels of student learning and determine the factors contributing to improved performance. The study deployed a mixed-methods approach for collecting data. Achievement tests in Bangla for quantitative data to know the learning level of the students and interviews with headteachers, assistant teachers, and classroom observations for qualitative data. The sample comprised 395 grade three pupils from ten districts, chosen using a multi-stage purposive sampling method encompassing both urban and rural areas. Factors associated with schools encompassed the effectiveness of headteachers' leadership and student attendance. Teaching-learning elements include teaching tactics, teacher training, clear instruction, motivational communication, feedback, and remedial actions. The variables contributing to out-of-school support include family support, provision of meals, additional classes offered by teachers, and coaching or tutoring assistance. Community-related characteristics encompassed the involvement of the School Management Committee and the level of communication between teachers and parents. The study suggested using a student diary, implementing a personalized learning plan, leadership training for Headteachers, establishing study groups, provide support to students during or after school hours. Thus, students' performance can be boosted.

Keywords: Student Performance, Factors, Government Schools, Student Diaries

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Introduction

Education plays a significant role in both direct and indirect ways in fostering socio-cultural and economic development. Consequently, the quality of education in a country directly influences the quality of its human resources. At the same time, parents now search for the how and where lies the keys to their children's academic performance.

Steinmayr et al. (2014) stated that the educational process depends heavily on student achievement since it reflects the degree of success and triumph that learners achieve in the classroom. Teachers, policymakers, and other stakeholders in the education sector must understand the elements that influence students' performance. It is possible to get knowledge to improve teaching and learning strategies, expand educational methodologies, and ultimately promote positive student outcomes by identifying and examining these elements.

In recent times, Bangladesh has made notable advancements in primary education regarding student enrollment and the widespread distribution of books to all students throughout the country. The government primary schools have an enrollment of approximately 13.5 million students out of 20.1 million. The government primary schools employ approximately 359,000 teachers, and female teachers constitute 64.41% of the total (DPE, 2021).

Welekwe et al. (2023) mentioned that teachers play an indispensable role in the educational process across all levels of the education system and within various educational provisions. In Bangladesh, there are 67 Primary Teacher's Training Institutes (PTIs) that offer one and a half years of DPEd training, one year of C-In-Ed training, and from July 2023 it offers 10 month-long Basic Training for Primary Teachers (BTPT) (NAPE, 2023). These PTIs exclusively provide training to government primary school teachers. Additionally, government primary school (GPS) teachers receive short-duration professional development training from the Upazila Resource Center (URC) alongside their long-term training.

In Bangladesh, many research studies have focused on teacher characteristics, teaching materials, weaknesses of student performance, learning losses caused by the Covid-19 pandemic, and classroom teaching-learning activities. However, there is a lack of comprehensive exploration into the broader causes that can influence student performance. This research aims to bridge this gap by investigating the influential causes that contribute to student performance.

Objectives

- To know the learning level of the students
- To identify the factors of better performance

Methodology

To determine the influencing factors in students' performance in a broader sense, the study conducted Achievement Tests to know the level of students' performance. This study employed both quantitative and qualitative techniques to gather the necessary data and information.

The quantitative methods were adopted to gather the data based on Grade Three level students' competencies in Bangla. This study collected data only from grade three to conveniently use the instruments and feasibility. On the other hand, qualitative data were necessary to gather the views of HTs, ATs, and classroom observations to identify the influencing factors of students' performance.

The study deployed four kinds of instruments, and data were collected from students, classrooms, assistant teachers, and headteachers. Considering the administrative division of Bangladesh, this study adopted the following techniques:

- Achievement Tests for Students (for assessing the performance of the students on literacy skills in terms of Grade level competencies),
- Interview schedule with Headteachers,
- Interview schedule with Assistant Teachers (Bangla), and
- Classroom Observations (Bangla).

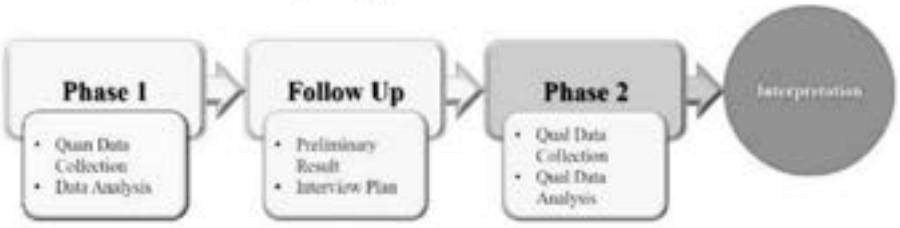

Figure 3.1 Cresswell (2012) 'Explanatory Sequential Design'

Therefore, this study demanded the integration of both quantitative and qualitative approaches. An 'explanatory sequential design' of the mixed method research approach was employed throughout the study.

Based on the Achievement test result, interviews with HT, AT, and Guardians and Lesson Observation were conducted to determine the factors behind the students' performance.

A representative sample size was 384 students to administer the achievement test. So, the required sample size was 384, and the study targeted 400 from GPS for representative sampling. After collecting data, 395 students were found to administer the test.

- The researcher selected ten districts following multi-stage purposive sampling. Among them, eight districts from eight administrative divisional headquarters of Bangladesh and two districts from Dhaka and Chattogram; Shariyatpur from Dhaka and Rangamati from Chattogram. The team purposively considered city/municipality (district town) and Upazilla (upazila headquarter) in school selection. Districts and upazilla were selected purposively.

Table 3.2.1: Sampling Procedure at a Glance (for Quan. Data)

Division	District	Upazilla	GPS	Students
8	10	20	20	20x4=800

- The researcher also selected 20 GPS purposively, 10 GPS from district towns and 10 from upazila headquarters from all eight divisions of Bangladesh.
- GPS was selected following random sampling techniques. 10 Girls and 10 boys students also were selected, considering random sampling techniques.
- The researcher collected qualitative data from the best two scoring schools and the lowest two scoring schools in the achievement test in the second phase.

Achievement Test Result Presentation

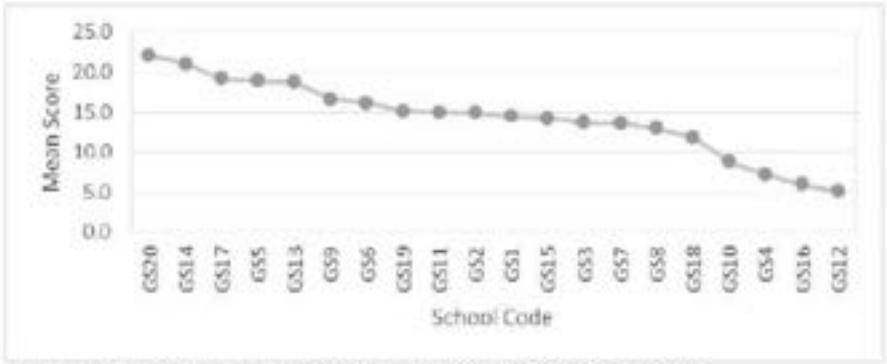

Figure 4.1.1: Mean score for literacy skills (N-395) for GPS

The above graph shows the school-wise students' performance in achievement tests for literacy skills of government primary schools. GS20 (22.2) got the highest mean score and GS12 (5.1) got the lowest mean score. GS14 (21.1) achieved the second-highest mean score and GS16 (7.2) was the second-lowest.

The average mean score in literacy skills is 14.3. Therefore, it can be determined that students in half of the schools scored below average on literacy tests.

Division	N	Literacy skills	SD
Barishal	40	17.0	4.2
Chittogram	76	16.9	6.2
Dhaka	79	11.7	6.2
Khulna	40	18.0	2.8
Mymensingh	40	12.5	6.4
Rajshahi	40	18.0	6.0
Rangpur	40	10.8	5.8
Sylhet	40	10.0	6.6

Table 4.1.1: Division-wise mean of literacy with SD for GPS

The table describes the division-wise comparative mean of literacy with SD. It was found that students of Sylhet, Rangpur, and Dhaka divisions got comparatively lower average scores among the eight divisions, whereas Rajshahi and Khulna divisions showed the highest mean of 18.0 in literacy. Moreover, SD displayed variations among the divisions. For instance, Khulna division had the lowest SD of 2.8, indicating the least variations among the students of the respective division. The higher variations were found in Sylhet, Mymensingh, Dhaka and Chattogram divisions, where SDs were 6.6, 6.4, 6.2, and 6.2, respectively.

Criteria		Literacy skills	SD
Boys (N=185)	Upazila Headquarter (N= 93)	11.8	7.4
	District Headquarters (N=92)	16.1	5.6
	Total	13.9	6.9
Girls (N=210)	Upazila Headquarter (N=102)	13.1	7.0
	District Headquarters (N= 108)	16.2	4.7
	Total	14.7	6.1

Table 4.1.2: Sex and location-wise mean of literacy skills with SD for GPS

It is revealed from the data that for boys in Upazila Headquarters (UH), the mean score in literacy is 11.8 with a standard deviation of 7.4. For boys in District Headquarters (DH), the mean score in literacy is 16.1 with a standard deviation of

5.6. The overall mean score in literacy for boys is 13.9 with a standard deviation of 6.9.

For girls in UH, the mean score in literacy is 13.1 with a standard deviation of 7.0. For girls in DH, the mean score in literacy is 16.2 with a standard deviation of 4.7. The overall mean score in literacy for girls is 14.7 with a standard deviation of 6.1.

Therefore, it can be concluded that girls tend to perform better than boys in literacy. Furthermore, students in district headquarters tend to perform better than those in upazila headquarters, regardless of their gender. Finally, the standard deviations indicate that the performance variability is higher for literacy.

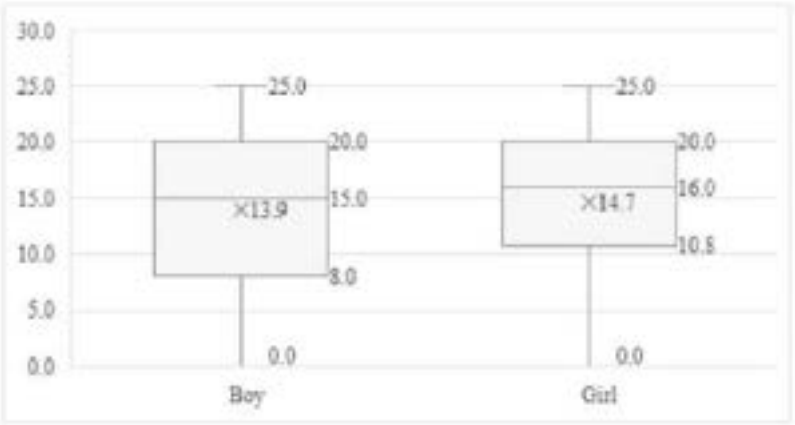

Figure 4.1: The boxplot for the total achievement score on literacy skills of boys and girls for GPS

The above boxplot for total achievement score of literacy according to sex reveals that the score of boys in the inter-quartile range is from 8.0 to 20.0 and the median score is 15.0, and for the girls, it is from 10.8 to 20.0 and the median is 16.0. It shows that the girl's score is prone to do better.

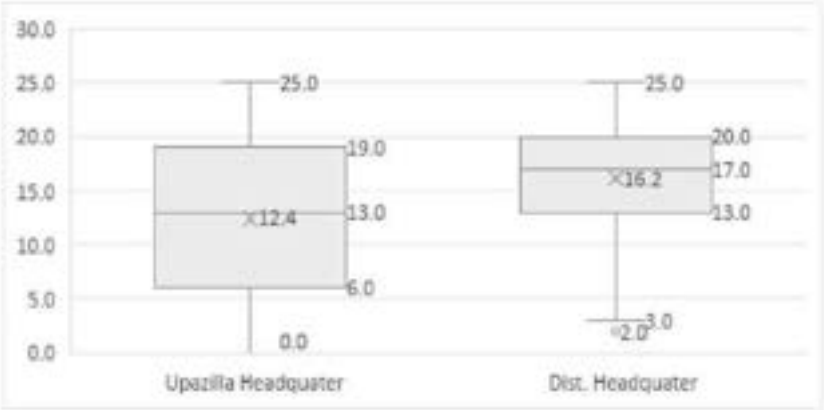

Figure 4.2: The boxplot for the total achievement score on literacy skills according to location

The above boxplot illustrates the score of literacy skills that the variation of district headquarters students in the inter-quartile range is between 13.0 to 20.0, whereas the upazila headquarters is from 6.0 to 19.0. In addition, the lowest score for district headquarters is 2.0; conversely, 0.0 is for upazila headquarters. Overall, the mean score of district headquarters is comparatively higher than upazila headquarters students.

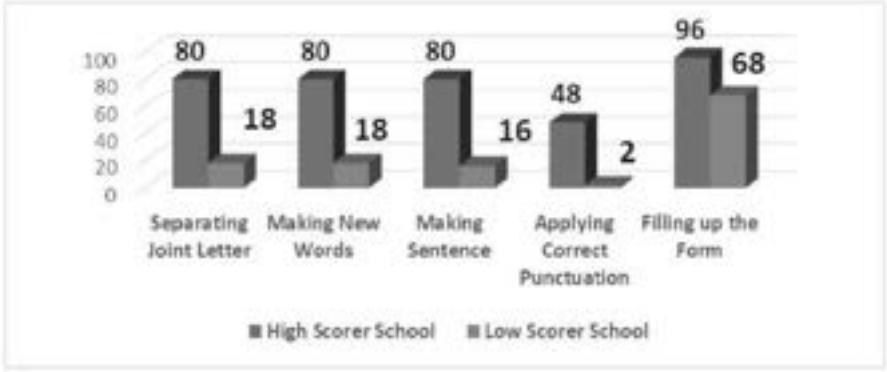

Figure 4.3: The total achievement score on literacy skills according to test item

Figure 4.1.9 above illustrates the high-scorer and low-scorer GPS students' results in separating joint letters, making new words, making sentences, applying correct punctuation, and filling up the forms. Students with high scorer GPS mean scores are 96% in filling up the form and 80% in separating joint letters, making new words, making sentences, and applying correct punctuation, respectively. In

contrast, low scorer school students' performance is very low in comparison with high scorer schools and in applying correct punctuation marks, they got the lowest (2%) scores.

Discussions and Findings

Teaching-learning Strategies: The classroom environment and the teaching-learning activities employed by teachers have a profound impact on student achievement (Tomlinson, 2000), such as students' readiness, interests, and learning profiles; appropriate learning activities help engage and challenge students in their levels, leading to increased achievement. In this study, ATs from high-scorer GPS also stated that they use different activities in the class to enhance students' readiness, enhancing students' learning. The activities are greeting the students (GBT_{02}, GBT_{04}), taking personal inquiries of students (GBT_{01}, GBT_{02}), creating a conducive learning environment (GBT_{01}, GBT_{02}), and checking prior knowledge (GBT_{01}, GBT_{03}). Then show the related teaching aids (GBT_{01}) write the lesson title on the board (GBT_{02}) ask questions in the light of the learning outcomes and let the students think alone (GBT_{01}), discuss in pairs and involve the students in different activities and which enhance the students' achievement (GBT_{01}). In contrast, a teacher (GBT_{04}) from a low-scorer school stated that he does not implement any specific activities to enhance students' literacy skills. So, it is found that low-scorer schools lack various readiness levels. GHT_{04} mentioned that untrained teachers are struggling to apply pedagogical knowledge appropriately in Bangla sessions.

Bangla which represents literacy in this research, high scorer schools try to apply pedagogical approaches in the classroom like separation of joint letters, creation of new words and meaning, making sentences, using punctuation marks, and filling up the form. In contrast, low scorer schools do not follow pedagogical aspects in the classrooms. They just come and ask students to read. The quantitative data also guided us in the same direction. The achievement test result is more than 60%.

Conjunct Letters: The current research reveals that teachers write the '*Jokto Borno*' on the board, show how to separate the '*Jokto Borno*' on the board and let them read it again and again. To interact with the students, they can use flashcards with different joint letters. GBT_{03} said that he uses letter cards and helps the students practice the joint letter, make separations of the joint letter, write the joint letter on the board, and let the students make new words with the joint letter.

New Word Meaning: The present research reveals that teachers write the main word on the board and do mind mapping. They introduce the new words' meaning with context or real-life situations. GBT_{02} said that after writing the word, he

pronounces it several times and students repeat it. Then he provides clear meaning and uses the word in sentences.

Making Sentence: It was revealed in the research that teachers write letters on the board and at first let the students say the words by the letters and let them make and say the sentences by the words. GBT_{02} said that he shows the words and helps the students to make sentences. He also uses pictures or prompts to help the students. He allows students to work in pairs or small groups to share their sentences.

Punctuation Marks: The current research revealed that teachers use punctuation cards and explain clearly with examples to teach punctuation marks. GBT_{02} said that he uses pair and group work to write sentences using punctuation marks.

Form fill-up Activity: The teachers said that they use models to teach form fill-up activities. They form groups and share a model to teach.

Overall, the findings suggest that high-scorer schools emphasize pedagogical practices for teaching Bangla. Different teaching strategies applied by the teacher influenced visible schools (GS20 and GS14) to get high scores on achievement tests. On the contrary, low scorer schools of GPS (GS16 and GS12) on achievement tests where different teaching strategies are not visible in the classroom.

Headteacher Leadership: Huang and Shen (2022) state that the notion of HT Leadership conveys that HT exercises influence over key functions of teaching-learning and how schools operate. Scallon, Bristol and Esboldt (2023) mentioned that headteachers who effectively establish positive relationships with teachers, students, and parents, provide instructional guidance, and foster a learning environment that promotes collaboration and student engagement are more successful in raising student academic achievement. In this study, GBT_{01} said that HT participates in academic activities, supervising and maintaining good relationships among the students, teachers, parents, and the community. GBT_{03} also mentioned that his HT is less serious about ensuring active teaching and learning in the classroom. GBT_{04} said, *"It seems to me our Headteacher doesn't know where and how to lead. He comes and performs some official duties.* This means the leadership of HT in this school is not supportive of improving student performance.

HT Leadership influence schools where visible (GS_{20} and GS_{14}) got high scores on achievement tests as well as was found during the observation; on the other hand, where HT Leadership influence is not so visible, got low scores (GS_{16} and GS_{12}) in the achievement tests. The same is found in Witziers et al. (2003).

Therefore, the Headteacher leadership of the school has influenced students' academic performance in government schools.

Student Diary: A student diary is used to write messages and homework for the students. It helps maintain teachers-parents and teachers-student relationships and improve students' performance and engagement (Pham et al., 2018; Ghannadi et al., 2017). HT_{01} and HT_{03} mentioned that it will be a bridge between parents and teachers, but they don't usually use it; we use Blackboard and students write in it their Khatas. HT_{01} also suggested that the government supply a diary or the school buy dairy from the SLIP fund.

School attendance supports their academic attainment (Oghuvbu, 2010). In the study, regular attendance became one of the key factors affecting students' performance. An HT (GHT_{01}) said, "*Students' irregular attendance breaks their learning continuity. So that irregular students in the school become backward students and can't perform well*". GHT_{03} mentioned that students come from diverse backgrounds and are irregular.

In-service teacher training enhances teachers' knowledge, raises their skills, and broadens their professional approaches (Öztürk, 2019) and classroom performance (Omer, 2021). The researchers found the various types of training programs offered to government primary school teachers of Bangladesh, including subject-based training, ICT in education, inclusive education, leadership, academic supervision, competency-based test item development, SLIP, UPEP, and pre-primary education, etc. A teacher (GBT_{01}) said, *"I apply my training knowledge by developing lesson plans, using teaching materials, and employing effective mathematics teaching methods and techniques.* Another teacher (GBT_{03}) mentioned, *"Apply the training techniques is difficult due to extra classes and other workloads, leading to a lack of following strategies such as lesson planning, utilization of teaching materials, and continuous assessment."*

Teachers' regular preparation and professional development demonstrate effective learning of the students and produce better student outcomes (Darling-Hammond, 2017). A teacher (GBT_{02}) said, *"Preparation is important for delivering the lesson successfully. Lessons are better if I go to class with prior preparation. Student achievement is ensured."* The researchers got the evidence during observation in high-scorer GPS.

Teachers' clear instructions are related to effective classroom learning and student outcomes (Brophy and Good, 1986; Wang, Haertel and Walberg, 1990). In the present study, it is clear that all the GPS teachers (high or low-scoring schools) can understand the importance of teacher instructions; however, in practice, the low-scorer schools' teachers could not perform it like the high-scorer

GPS teachers. A teacher (GBT_{03}) also stated, *"I try to give clear instructions always to the learners in all of my lessons and take feedback from them. If needed I repeat my instructions as they can understand it clearly."*

Teaching aids capture students' attention, make abstract concepts more concrete (Karakış, 2016), encourage hands-on learning and active participation, and lead to improved motivation and comprehension (Baker et al., 2018). It also contributes to the development of language and literacy skills (Morgan, 2018). The researcher finds (GBT_{03}) lacking in practicing teaching aids in their lessons, and they also lack sufficient skills in using teaching aids.

Homework completion and academic achievement have a positive correlation (Cooper, Robinson, and Patall, 2006). According to GBT_{01}, *"I assign homework, collect it daily, and provide feedback. This approach facilitates easy and engaging learning, ultimately enhancing students' skills."* Lack of support at home leads to incomplete homework and due to this reason, many students frequently miss classes (GBT_{03}).

Motivational expressions evoke feelings of empowerment, enthusiasm, and a positive mindset among the students (Brown, 2014) and help individuals maintain focus, optimism, and a strong commitment to personal growth and success (Taylor, 2020). According to GBT_{01}, *"I always motivate my students in the classroom. It inspires them, instils confidence, and helps them grow their interested in learning. Even I called them by name and became their friend."* On the other hand, GBT_{03} stated that *"I occasionally praised and inspired the students during the lesson to motivate them."* During the observation, it seems the same.

Assessment is about getting to know the students and the quality of their learning (Rowntree, 2015, p.1). A teacher (GBT_{01}) mentioned, *"I assess every student in my class and ensure their learning. Sometimes I take the exam after completing a chapter"*. Oppositely, another teacher (GBT_{03}) stated, *"I assess my students not a regular basis, but some of the students weren't involved in the assessment process due to their irregularity."*

Effective, timely, specific, and actionable **feedback** ensures learning goals and solves target areas (Kluger & DeNisi, 1996; Hattie and Timperley, 2007). A teacher (GBT_{01}) stated,

> *"During conducting lessons, I find out the slow learners, go to them and provide feedback to them. Sometimes I help them directly, and some other times I use the advanced learners to help the slow learners. Thus, I can ensure mastery learning for all my students. I always motivate my*

> *students in the classroom. So, feedback and remedial measures are very important in ensuring learning for all the learners."*

However, in contrast, in the observation of a low-scoring school, the observer found that teachers in the school did not provide feedback based on individual proficiency levels. Instead, they merely marked tick marks in the notebooks without addressing students' specific needs.

Parental support was directly related to academic achievement (Chang et al, 2015). Conscious parents' children have excellent academic performance (Al Husaini et al., 2022). An HT (GHT04) said, *"Parents who are poor, are reluctant to their children."*

Extra support and guidance from their teachers had significantly higher test scores compared to those who did not (Huynh et al., 2019). A teacher (GBT_{01}) said, *"I identify slow learners and conduct extra classes. Sometimes, I use advanced learners to provide support to slow learners".* In contrast, another teacher (GBT_{03}) said, *"Generally I don't take any attempts for the students besides the regular lessons."*

An adequate and sufficient healthy **intake of food** is essential to brain function (Abu Saa et al, 2019; Al Husaini & Shukor, 2022; Borphy, 1986); as a result, it maximizes the ability to focus, comprehend, evaluate, and application – in learning (Francisco, 2020; Habibullah, 2013). An HT (GHT_{02}) said,

> *"Most of the students at our school bring their mid-day meal and some return home for mid-day meals near the school. Mid-day meals fulfil students' food demands and make them feel lively. So that they can give their full attention in the classroom."*

Coaching or tutor support significantly improves student performance (Guryan et al., 2021). An HT (GHT_{03}) said, *"Students who participate in private tuition, their result is comparatively better than others."*

Every GPS in Bangladesh has a School Management Committee (SMC) comprising 11 members from different backgrounds in the locality (DPE, 2019). A head teacher (GHT_{02}) mentioned,

> *"SMC assists in organizing annual sports competitions in schools or celebrating various national days. They also help the parents to ensure the admission of school-going children at the time of admission. They inspire the students by providing the best students award."*

It is observed that while SMC is active, it has the potential to influence the academic achievement of the students positively.

Teachers-Parents Communication immediately increased student engagement, homework completion rates, on-task behaviour, and class participation (Kraft & Dougherty, 2013). A teacher (GBT_{01}) mentioned, *"Communication with the parents helps fill up learning gaps, preparing the lesson at home and irregular attendance etc."* Similarly, a teacher (GBT_{02}) said, *"The parents take care of the progress of their children's studies and communicate with us if needed. Even whenever some guardians ask about their child when he sees me on the road or in the Bazar(market).* An HT (GHT_{03}) commented, *"Most of the guardians are unaware of their role, and we are unable to get minimum support from them (lack of devices, broken family children also). For this reason, it may affect the student's performance in the achievement test."*

Socioeconomic status positively correlates with academic achievement (Kaptich, Kiplangat & Munyua, 2019). An HT (GHT_{02}) said, *"Economically strong parents can ensure their children's nutritious food, well dressed, and learning aids, and expense necessary money for private tuition, etc. So that their children perform well."* On the other hand, another HT (GHT_{03}) said, *"Most of the students at my school aren't from rich families, and they can't provide extra to them. it affects their learning."* GHT_{02} shared an interesting point, *"Parents are prone to send their children to Kindergarten School, even low-income families think it is prestigious."*

Parent education is probably the most prominent factor in students' learning (Briones et al., 2022). All interviewed teachers in this research unanimously replied that educated parents were very conscious about their children, kept contact with them, took care of their children, checked class work khata, revised lessons at home, and provided materials like khata, pencils, dresses, etc.

Guardian awareness influences the academic success of their children (Trautwein, 2007). Teachers (GHT_{01}, GBT_{02}) mentioned that aware parents are very careful with their children, they spend a long time, ensure nutritious food, communicate with teachers to know the status of their children and take extra care for their learning. Teachers (GHT_{03}, GBT_{03}, GHT_{04}) mentioned that unaware parents aren't careful about their children's education, they have apathy about their children's education. An HT (GHT_{04}) said, *"We request them to take the initiative to study their children at home and send them to school regularly. But most of them don't take any initiative for the learning of their children."*

Factors Influencing Students' Performance in GPS

1. School-related Factors
    a. Headteacher Leadership
    b. Student Regular Attendance

2. Teaching-learning related Factors
    a. Teaching-learning strategies
    b. Teacher Preparation
    c. Teacher Clear Instruction
    d. Motivational Expression
    e. Feedback and Remedial Measure
3. Out-of-School Support
    a. Parental Support
    b. Food Support
    c. Teacher Extra Class Support
    d. Coaching or Tutor Support
4. Community-related Factors
    a. School Management Committee
    b. Teacher-Parent Communication

Recommendation and Conclusion

- Student diaries need to be introduced in GPS to keep records and encourage communication among the teachers-students-parents.
- Teachers need to address the learning needs of students following a one-to-one approach (individual learning plan).
- The active academic leadership of the Headteacher needs to be ensured by providing training and follow-up monitoring.
- Teachers should provide feedback and remedial support to the students during break time or after school closer and ensure weak students' learning achievement.
- Teachers should form study groups or arrange study time for the students besides classroom teaching-learning activities.
- Leadership training should be given to all Headteachers.

In this study, the researchers wanted to discover the factors that influenced the academic performance of government primary schools, especially in achieving literacy skills. According to the achievement test results, the researchers identified the top two best scorer schools and low scorer schools. The researchers identified some factors that influence students' performance broadly, such as headteacher leadership, student diary, student attendance, teacher preparation, parental support, etc.

Several gaps were identified in this research which need to be met by further research, which will include-

- Initiate further research to identify how much each factor influences student performance.

- Further study on factors behind girls' ability to achieve better results in literacy.
- Research can identify that students in district headquarters tend to perform better than those in upazila headquarters, regardless of gender.

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Enhancing Bangla Reading Fluency: Strategies for literacy Improvement in Bangladesh

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Abstract

This study investigated effective strategies to improve Bangla reading fluency skills among grade 3 students, to reach the benchmark set by the National Academy for Primary Education. The study employed a mixed-methods approach, integrating both quantitative data analysis and qualitative perspectives from educators and students. Results from reading fluency tests were analysed, and it was found that readers were reading 49 correct words per minute (cwpm) on average, with a 48% comprehension rate. Only 9.3% of pupils met competency levels, according to a comparison with the benchmark, suggesting growth potential.

Students' reading fluency has been demonstrated to be positively impacted by elements including parental participation through consistent attendance at meetings and access to a school library. While authorities are recommended to give priority to school library initiatives and family awareness programmes, instructors are advised to adopt best practices including model reading and vocabulary training. Schools can help students achieve academic achievement and improve their Bangla reading fluency by putting these techniques into practice.

Keywords: Bangla Reading Fluency, school library, proficiency

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Background of the study

Reading involves more than just decoding the text; it also requires comprehension and reading aloud with an acceptable rate, decoding words correctly, recognizing words, phrases, and sentences as coherent, meaningful units (Johnson, 2017), and reading words without stretching or slicing them into separate sounds (Anthony, 2023). This capacity to read quickly, accurately, and with appropriate expressions is known as reading fluency. Anthony (2023) states that "fluency is the reader's ability to read with accuracy, automaticity, appropriate phrasing, and intonation." Students must be able to read fluently, whether they are reading loudly or silently, to comprehend what they read (Plessis, 2022). The three fundamental components of reading fluency are the concept of print, phonemic awareness, and vocabulary (Dixon, 2018).

The standard for Bangla reading fluency was suggested at 46 correct words per minute for grade III (Alam et al., 2021). According to another research, third-grade children's reading fluency was found 48 words per minute, with significant achievement deficiency among the pupils (Roy et al., 2019). Education professionals are now worried about Bangladeshi elementary school children's fluency in reading Bangla. Policymakers are now interested in the situation to increase the primary students' ability to read Bangla fluently.

However, primary school students in Bangladesh do not have a satisfactory level of reading comprehension. According to research by World Vision, 54% of third-grade pupils do not comprehend what they read, and the reading fluency rate is also quite low (The Daily Star, 2018). Different research by the National Academy for Primary Education found that 6% of grade three kids are completely unable to read and 73% of them struggle to read in Bangla (Roy, et al., 2019). Which is a significant challenge to meet the competency requirements of the national curriculum. Moreover, a study conducted by Alam et al. (2020) recommended a baseline study to identify the present situation of students' reading fluency in Grade 3 and suggested year-wise situation analysis for measuring students' reading fluency level.

Although many things are being done to change the situation. However, policymakers want to take more action to raise the fluency level of primary students as one of the SDG targets (4.1.1) clearly stated to achieve at least a minimum proficiency level in reading. Nevertheless, there is a sizable knowledge gap in this area. There are not enough insights on the issues, nor are there enough details about solutions. In addition, Alam et al. (2020) recommended a baseline study to identify students' reading fluency in Grade 3. Besides, appropriate strategies for improving the present condition can not be designed without understanding the current status. Therefore, it is of the utmost significance that

this study pinpoints the issues causing the students' poor performance in this area and tries to offer appropriate recommendations for moving forward.

Objectives of the study

The paper aimed to identify the effective actions that can improve students' Bangla reading fluency skills, which will lead grade 3 students toward the benchmark set by NAPE. To fulfil the objective, this study tried to find out the answer to the following research questions-

- What is the status of Bangla reading fluency compared to the Benchmark at grade 3?
- What are the effective actions that can improve Bangla reading fluency towards the Benchmark?

Literature Review

Reviewing a set of written symbols and extracting meaning from them is referred to as "reading" (English Club, 2023). It is the most fundamental element of language. A proficient reader can read at the right rate, comprehend what the text is trying to express, and extract information from it. As readers gradually learn that meaning is frequently more complex than a single word, sentence, or paragraph, their reading abilities improve with time. In the end, readers develop their ability to make associations and read between the lines (Tánczikné, 2017).

Decoding or pronouncing the text is the initial step in learning to read (Hollowell, 2023). Decoding is therefore important for learning to read. When kids are aware that each letter of the alphabet stands for a certain sound, they can decode it. The following phase is teaching children how to decipher printed words, separate each sound into its entity, and then assemble those independent elements to read the word (Hollowell, 2023).

The second, particularly important for reading ability, is vocabulary knowledge. Simply explained, vocabulary is the collection of all words. This includes a wide range of other keywords in addition to sight words and frequently used words (Johnson, 2017). With each book they read, good readers expand their vocabulary, and they can recall these terms when they are used again. They begin by studying sight words as their first task (Hollowell, 2023).

A student who reads for academic purposes needs to comprehend the text's meaning. Understanding the material is necessary for reading with improved expression and maintaining a steady pace. It is the major reading skill component to understand the text while a child can sound out the written text and identify the word's meaning (Hollowell, 2023).

How to develop reading fluency

The final objective of reading is reading comprehension, which is a foundational skill of language. Therefore, the reader must read at the appropriate pace. accuracy, phrasing, and comprehension. Numerous strategies, tactics, techniques, and approaches can be used to increase pupil reading fluency.

Instructional Strategies for Fluency Development

Two main fluency-related instructional strategies have been investigated by research. In the first method, known as repeated and supervised oral reading (often referred to as "repeated reading"), students read aloud passages numerous times while getting feedback and direction from the teacher. The second method, known as independent silent reading, pushes children to read widely on their own (Armbruster, Lehr, & Osborn, 2002). So, a teacher has to provide models of fluent reading so that students can practice reading the passages with proper fluency. Schools or teachers can ensure books to read independently. Reading programs provide an emphasis on fluency using exercises like echo and choral reading, which give pupils a chance to enhance their reading abilities and model fluency after the teacher (Hollowell, 2021).

Role of teachers in literacy-rich environments

To assist students, remember and generalize new concepts and skills, teachers employ a few communication strategies, including questioning, labelling things, and experiences with new vocabulary, and providing practice (Whitehurst, 2003). According to Gunn, Simmons, and Kameenui (1995), teaching staff design activities that give students "*opportunities to integrate and extend their literacy knowledge by reading aloud, listening to other students read aloud, and listening to tape recordings and videotapes in reading corners.*"

Methodology

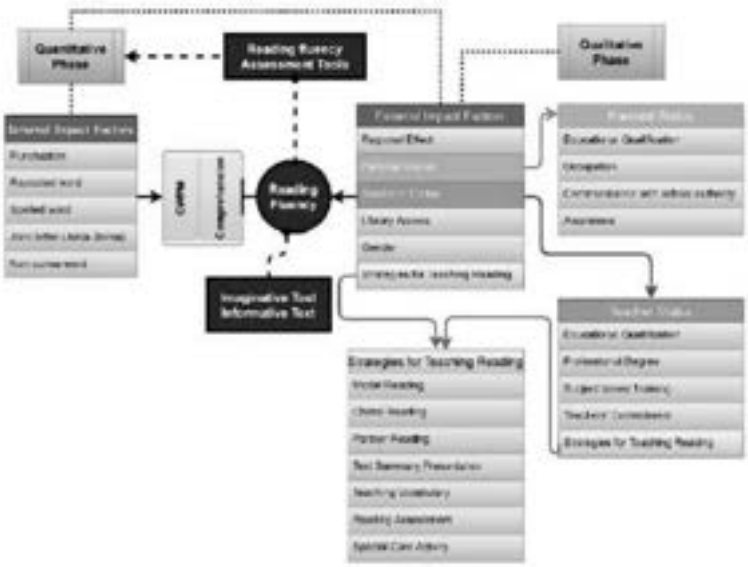
This section includes the conceptual framework, study design, sampling procedure, data collection tools and analysis process of the study.

Conceptual Framework

To meet the research aims the following conceptual framework was developed. Reading fluency is the reader's ability to read accurately, and automatically with comprehension indicates cwpm with comprehension. Two types of texts were implied as cwpm differ depending on the difficulty level of texts (Ardoin et al., 2005; Compton et al., 2004). Various research elicited several factors that significantly impact students' reading fluency. These factors were divided into two broader categories: internal and external. Internal factors were punctuation, repeated words, spelt words, joint letters (Jukto borna), and non-sense words. Some external impact factors were also identified – regional effect, parental status (Geske & Ozola, 2020; Torres, 2019; Yusup & Ahmed, 2016; Vickers & Minke,

1995), teachers' status, library access (Rodrigues & Mandrekar, 2020), gender and teaching reading strategies.

The internal factors were revealed by quantitative data and external factors were uncovered by both quantitative and qualitative data.



Study Design

This article is a part of the research done by the National Academy for Primary Education (NAPE) in FY 2022-2023 and the authors of this article are the members of that research team.

This study followed the explanatory sequential mixed method approach. The integration in an explanatory sequential design is intended to connect the quantitative and qualitative phases of the study so that the subsequent qualitative phase provides a strong explanation for specific results from the initial quantitative phase (Creswell & Clark, 2018). The researcher collects and analyzes quantitative data first, then collects and analyzes qualitative data in connection with the quantitative results, and finally, uses both results to find the answers to research questions.

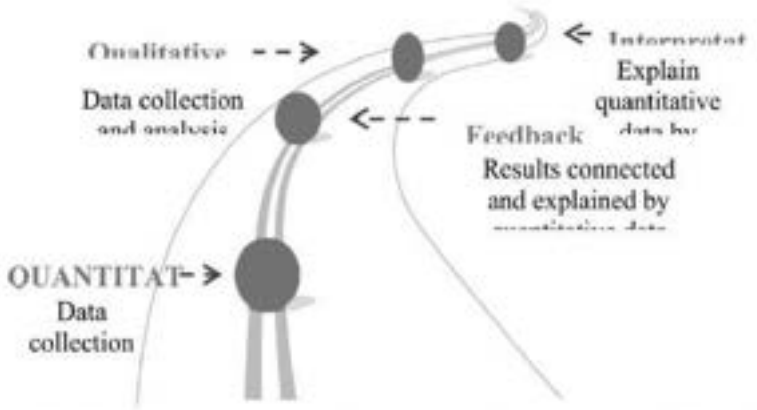


Figure 3.1: Explanatory sequential mixed method design adopted from Cresswell & Clark (2011)

Strategies for Phase 1

Phase 1 was mainly focused on quantitative data collection and analysis which led to determining the selection of samples and instruments for phase 2. Details of all the steps are as follows:

Sample and Sampling Techniques

The census for phase 1 was all the grade 3 students of Government Primary Schools (GPS) in Bangladesh. This study covered all divisions and considered six different types of regions and both genders as well. The population of the study for phase 1 was 3,357,052 (MoPME, 2022). A multistage cluster sampling strategy was used to select the required number of students from grade 3.

$$Sample\ size = \frac{Z^2 \times P(1-P)}{e^2} \quad \text{..... (Cochran, 1963)}$$

[Here, Z=1.96 (for 95% confidence level), e=0.05, P=0.5]

The sample size was found to be 384, while to avoid risk, the required sample size was determined as 400 for each geographical region. To select representative samples from each of the six locations, the total sample size was $400 \times 6 = 2400$. Finally, a total of 2389 students were traced for data collection. The sampling design was as follows:

Figure 2: Sampling design

The sample distribution was as follows:

Table 1: Sample distribution at a glance

Division	District	Upazila	No. of Schools	Students (Grade 3)		Total Students
				Girls	Boys	
8	2×6=12	2×12=24	5×24=120	10×120 =1200	10×120 =1200	1200+1200 =2400
Purposive Sampling			Simple Random Sampling	Systematic Random Sampling		

The researchers chose to develop two different types of texts for the reading fluency test - imaginative text and informative text. Researchers examine the Bangla textbook for third graders and establish a text development guideline

Initially, in a text development workshop, the teachers developed 28 texts (14 Imaginative and 14 Informative) along with 6 to 8 questions based on knowledge, understanding and application for each text.

A pilot was done in four government primary schools in the Mymensingh district. Two sets of texts—two imaginative and two informative —were chosen for the final reading fluency test following analysis of the piloting data.

Quality Control of Data

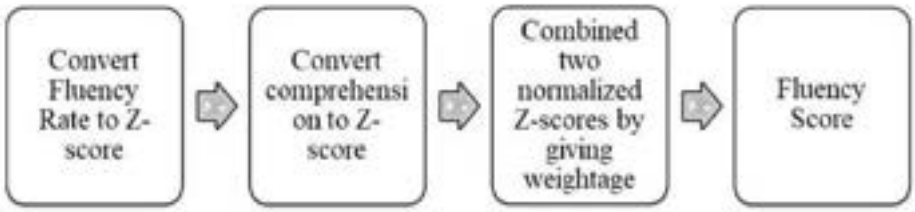
Field-level Research Associates were selected from Primary Teachers Training Institutes (PTIs) and a two-day long workshop on research methodology, data collection guidelines, tools administration by using the guideline, and data entry process in the Kobo toolbox etc. were conducted to ensure a quality data collection.

Quantitative Data Analysis

The collected data was analyzed through quantitative data analysis procedures. SPSS (Statistical Package for Social Sciences), Jamovi, and JSP software were used to analyze the cleaned data. To satisfy the purposes of the research, various types of analysis were done which are as follows:

- Frequency, Percentages
- Measure of central tendency- mean, standard deviation
- Data conversion- Z-score or normalization, measuring weighted value
- Significance Test- T-test, ANOVA (Analysis of Variance)

- Correlation



When calculating the fluency score, the Z-score is used in the following manner-

Strategies for Phase 2

To discern the reasons behind students' achievements in phase 1, five schools with the highest performance and five schools with the lowest performance were chosen based on the academic achievements of the students. After selection, the Bangla teacher of grade 3 from each school was selected for in-depth interview. Bangla classes were also observed by an classroom observation checklist to triangulate the data found from the interview.

Qualitative Data Analysis

Qualitative data collected in phase 2 was analysed by following Braun & Clarke's (2006) thematic analysis approach at a semantic level. Figure 3.2 shows the thematic analysis process following the approach.

Figure 3.2: Braun and Clarke (2006) thematic analysis process

Coding

In qualitative data presentation, to protect privacy and confidentiality interviewed teachers and observed classrooms are given code by following the below table:

Table 3.2: Coding for qualitative data

Respondents	Code
Teacher	TI^{01}-TI^{08}
Classroom Observation	CO^{01} - CO^{08}

Ethical Consideration

To conduct this study the researchers followed some ethical issues:

- Researchers first explained the purpose of this study to the respondents to collect data. Respondents were assured that the data would only be used for academic research purposes and their identity would be kept confidential. During data collection, the researchers have taken consent from every school for collecting data.
- Researchers took special care to respect the participants' privacy, confidentiality and cultural sensitivities and their related institutes.

Results and discussion

All eight divisions and six pre-determined regions were covered by this study.

Figure 4. 1: Hitmap of data collection areas

Among the 2389 sampled students about 80% of them were fluent readers and the rest one-fifth of were found to be non-fluent. According to the National Assessment of Educational Progress Fluency Scale (Hasbrouk, 2008), this study considered non-fluent readers who could primarily read in two-word phrases with some three or four-

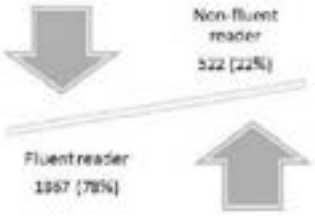


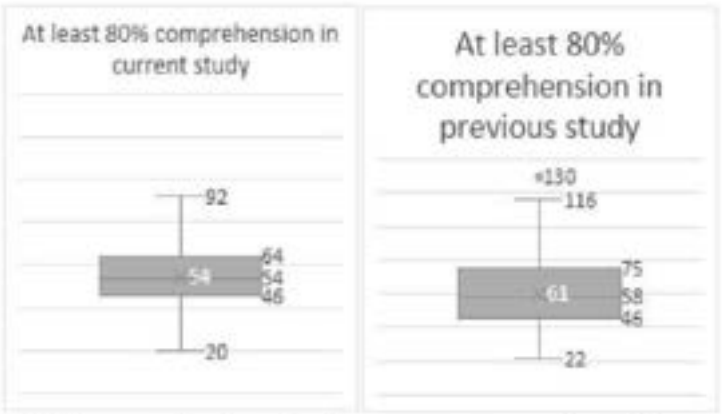
Figure 4. 2: Proportion of fluent and non-fluent readers

word groupings and occasional word-by-word reading.

Reading fluency test results were analysed among the 1867 fluent readers. The reading fluency and comprehension rates were about 49 cwpm and 48% respectively.

Status of Bangla reading fluency compared to the Benchmark

A secondary analysis has been done for the study conducted by NAPE in 2020 just before the COVID-19 pandemic. That research aimed to set a benchmark for Bangla reading fluency for grade 3 and grade 5. This secondary analysis tried to compare the results of the current study with the benchmark to understand the present situation of reading fluency, specifically in grade 3 as those students were in grade 1 and grade 2 during the pandemic.



These boxplots compare students with at least 80%

Figure 4.3: Comparative boxplots between current study and the previous study

comprehension of both texts. It is encouraging that there were fewer differences among the students in the current study than there were in the last one. However, the present study's students scored lower than those of the prior study, which may be a result of the Covid 19 pandemic's detrimental effects.

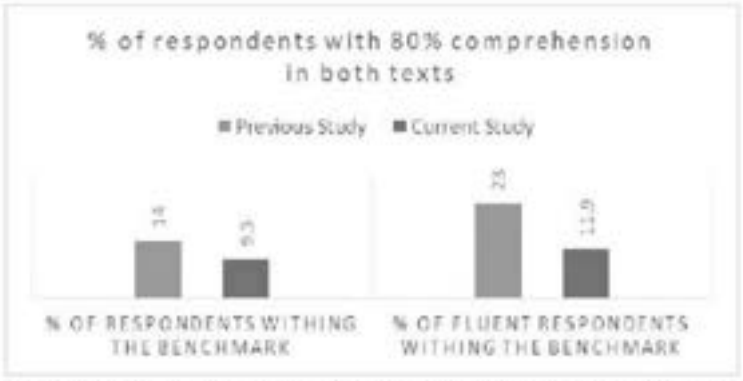


Figure 4. 4: Comparison of respondents with 80% comprehension in both texts

The earlier study recommended 46 cwpm as the standard for Bangla reading fluency with 80% comprehension. When compared to the benchmark study, 23% of respondents were found to be proficient, this study's response rate was 11.9%, about half as high. Furthermore, it was discovered that the percentage of respondents falling inside the benchmark was larger in the previous study (14%) compared to the current study (9.3%).

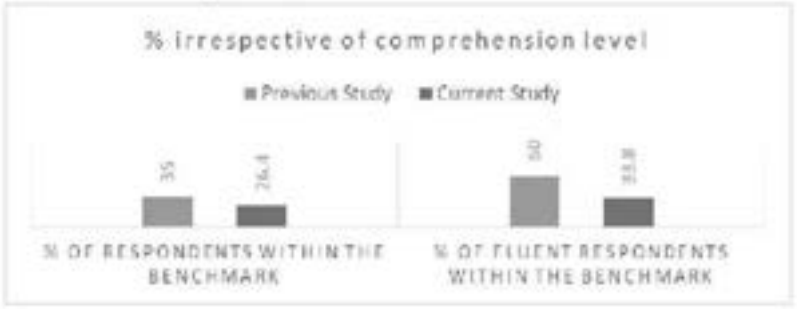


Figure 4. 5: Comparison of respondents irrespective of comprehension

This graph compares the percentage of respondents with any degree of comprehension within the recommended benchmark across the two surveys. Here, too, the percentage of fluent readers (60%) was nearly twice as high as that of the current study (33.8%), and the percentage of responses falling inside the benchmark regardless of comprehension was also found to be greater than that of the current study.

Various arguments on the present status of students' reading fluency were found in the teachers' interviews. Several assistant instructors claim that while online education was still being offered at the time of the school's closure due to the COVID-19 epidemic, there were no academic losses (TI05) while other teachers observed notable learning deficiencies. One of the most important causes of non-

fluency (TI02) is "stopped face-to-face teaching activities during Covid" and "we were unable to provide lessons to our 1st and 2nd graders about the alphabet and other fundamental knowledge about the Bangla language (TI03)." NCTB (2023) also showed a similar result as it found that students in grade 3 had a learning loss of about 15% and a large increase in the "severe" level learning gap in Bangla subjects due to Covid-19.

Effective actions that can improve Bangla reading fluency toward the Benchmark

In the following section, effective actions, activities, or measures that can improve Bangla reading fluency are discussed.

Effective measures by family/ guardians

Parental interaction with schools

Table 4.1: Attending parents' meeting

Attending parents meeting	%	Total Fluency Score	p-value (t-test)
Yes	87.7	49.8	0.007
No	12.3	45.4	

Students' performances in reading were found significantly improved for whom parents regularly attended parent meetings, which was also supported by the teachers as they mentioned that students performed better in this case because "*… scheduled meetings with parents… and we advised for more support to be given to the students at home to develop the reading skill (TI01)*". Students typically perform better when parents participate in their children's education both at home and at school and have relationships with teachers that are mutually supportive, warm, and respectful (Fan & Chen, 2001).

Helping person outside of schools

Table 4.2: Having helping person(s) outside of school

Helping person	%	Fluency Score	p-value (t-test)
Yes	91.7	50.0	0.000
No	8.3	41.3	

Most of the students (91.7%) received assistance from parents or other members beyond the school premises. Moreover, the p-value is evident that having a helping hand outside of school hours had a statistically strong

significant effect on getting better fluency scores. Students who got better fluency scores who got parental support from home or who received private tutoring or coaching centres. Teachers also acknowledge the impact of outside-of-school support on student achievement by pointing out, that *"parental support, rather than teachers', can positively affect students' reading fluency developnent (TI^{01})"*.

Scope of reading materials at home

The learners' reading comprehension is significantly impacted by factors relating to their homes (Torres, 2019). Slightly above one-third of the students had reading materials such as newspapers, magazines, novels or any type of books for their reading at home and they performed comparatively better. In addition, the teacher who was interviewed advised parents to prioritize reading at home (TI^{05}). It can be then surmised that having reading materials at home would be a suggestive factor for improving reading fluency skills.

Effective measures by the school authority

The data is evident the effect of having a library with access to it on students' reading fluency skills. About 90% of the students had access to a library or bookshelf and students at those schools scored higher, which was found to be strongly significant. One of the Bangla subject teachers responded, *"I noticed that the pupils who are reading additional books from the school library, their fluency develops dramatically. (TI^{01})"*. So, to achieve academic success, libraries should put more effort into becoming appropriately resourceful (Rodrigues & Mandrekar, 2020).

Table 4.3: Library access

Library access	%	Fluency Score	p-value (t-test)
Yes	89.8	50.5	0.000
No	10.2	42.9	

Effective strategies in the classroom

Loud reading

Almost all the students reported having their scope to read loudly in the classroom and as all the teachers gave that scope, loud reading did not make any significant difference in students' reading fluency. Classroom observation and teacher interviews reported the same- *"I ask students to read aloud in groups (TI^{01})"*. Classroom observation from a well-performed school also showed that the teacher asked for reading loudly as part of individual work (CO^{04}).

Reading assessment

Teachers' awareness of each student's level of fluency was found important as they had to develop their pupils' specific areas of reading deficiency. A teacher from a well-performed school verified this by saying, "I used to frequently assess my students' reading abilities (TI^{01})".

Techniques used in the classroom

Several classroom teaching techniques were identified from teachers' interviews and classroom observations that had a positive influence on students' reading fluency development.

From the good practice of best-performed schools, the ascertained strategies model reading and group reading were found useful for the development of reading abilities. Additionally, teachers felt that joint letter teaching and providing opportunities for practicing making sentences with newly introduced words were essential for the development of reading skills.

Joint letter separation is a must activity for Bangla class. teachers use this activity in every lesson as a teacher mentioned, "I have shown the joint letters by breaking down to unique letters of the daily lesson (TI^{01}). The classroom observation information also indicates that the classroom teacher of CO^{02}, CO^{03}, and CO^{04} displayed the joint letters by separating them into distinct letters, allowing the pupils to transcribe by separating and pronouncing the terms with combined characters.

In the Bengali class, a frequently used technique employed by the teacher is to make sentences using newly introduced words. This exercise helps to enhance the students' vocabulary and comprehension abilities, as they are encouraged to construct meaningful sentences (TI^{01}). This approach was also observed during classroom observation (CO^{02}).

Supporting struggling students

Through the identification of specific areas of difficulty, customized assistance is offered within the classroom. A teacher highlighted during the interview that *"I match students who are having trouble with reading with those who are fluent in reading, thus enabling them to learn together (TI^{05})"*. Furthermore, *"I advise parents to make reading a top priority at home (TI^{01})"*.

Recommendations

This study is just an initial stage for knowing the situation of Bangla reading fluency at the primary level. The following recommendations have been drawn from the study for teachers, policymakers and education experts for further research.

Recommendations for Teachers

- Teachers need to use model reading, choral reading, partner reading, teaching vocabulary, joint letter teaching and other best practices identified by this research in Bangla teaching-learning activities to enhance students' reading fluency.
- PTA, Mother's meeting, Uthan Boithak needs to strengthen for building awareness among guardians about the importance of parental support and how to help their children at home.
- Motivate guardians to make scope for various reading materials at home.

Recommendations for Policymakers

- Parents' awareness programs and home support strategies need to be initiated with long-term planning.
- Initiative needs to be taken to establish school library by providing class-wise SRM and ensuring easy access and use of the library.
- Decisions need to be taken on conducting year-wise situational analysis study to measure the level of students' reading skills.
- Conducting experimental research to find out the effect of best practices found in this study.

Conclusion

Reading fluency is an important language ability. Understanding the text is a key component of reading, in addition to sounding out the letters and words. However, previous research has shown that Bangladeshi primary school children's reading fluency in Bangla is not at an acceptable level.

So, to understand the current state of primary pupils in grade 3 reading fluency and to find effective solutions for improving it, researchers conducted this study.

Researchers learned several remarkable facts from this investigation. This study found that a considerable proportion of students are not yet fluent. Reading fluency and outside-of-school support have a substantial relationship. Additionally, it is shown that the teaching and learning methodologies used in the highest and lowest-performing schools differ noticeably.

The fluency of the pupils should be developed in Bangla reading according to the researchers' recommendations. Additionally, researchers consider that there are still knowledge gaps. Therefore, there is much opportunity to conduct further research to find more ways for the primary-level pupils' difficulties with Bangla reading.

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