

**Exploring the Understanding and Practice of Brain-Based Learning (BBL)
among English Medium School Teachers in Dhaka city.**

By

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in partial fulfillment of the requirement for the degree of
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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Ethics Statement

I, Mahnaz Mahmood, hereby solemnly affirm that for the manuscript titled “Teachers' Understanding of Brain-Based Learning (BBL) in the Teaching and Learning Process at Dhaka,” the following conditions are met:

- This work is my original creation and has not been previously published or submitted elsewhere.
- All sources utilized in this manuscript are properly acknowledged and cited. Text that is directly quoted is identified with quotation marks and appropriate references.
- All participants in this research willingly agreed to participate.
- The identities of the participants in this research are kept confidential, protected, and will not be disclosed at any time.
- The findings are appropriately contextualized concerning both previous and current research.

Abstract

This study explores the integration of educational pedagogy (BBL) of English medium schools in Dhaka, focusing on teachers' perceptions, current practices, and the support and challenges they face. Through in-depth interviews with six English-medium school teachers and head teachers, complemented by two classroom observations, this research highlights the impact of BBL tools on student engagement and learning outcomes. Teachers reported increased student interest, improved comprehension through multimedia content, and alignment with diverse learning styles as the learning sustainability increases and learning by doing helps to transform the traditional classroom into student-centered learning. Despite these benefits, challenges such as a lack of training, insufficient resources, and heavy workloads hinder effective implementation. The findings provide valuable insights into the role of BBL in enhancing educational experiences and inform future strategies for effective BBL method integration in international education. Further research is recommended to explore longitudinal impacts and comparative analyses across different regions.

Keywords: Brain-based Learning (BBL); Teacher Perceptions.

Dedication

To all the English medium school teachers who are thinking outside the box and bringing innovation to their classrooms, ensuring quality education despite numerous challenges.

Acknowledgement

I would like to express my heartfelt gratitude to my supervisor, Nazmin Sultana, for her insightful guidance and invaluable feedback. Her sincere support and expertise have been instrumental in shaping this research. Additionally, I extend my thanks to all the participants who generously dedicated their time and shared their experiences during the interviews, making this study possible.

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Chapter 1

Introduction

1.1 Background

The human brain is arguably the most advanced creation due to its unbelievable potential. The brain — probably is the most complicated organ of the body that plays a crucial role here. The brain is a complex organ with significant functions, marking a fundamental milestone in learning and reasoning (Kandel et al., 2013). This knowledge can also be applied at the level of education systems, within which the principles of brain research are merged with methods to educate and learn. Incorporating brain anatomy and physiology provides a better way to utilize teaching methods and improve learning outcomes for most students and educators (Willis, 2010). Our schools have remained unchanged for years, and many teachers continue to use conventional teaching methods. These traditional approaches often involve giving lectures, establishing rules, and instructing students to comply with orders like sitting down, taking books out, and not talking to others (Freire, 1970). Typically, students are trained in batches and rewarded for conforming to the teacher's instructions.

However, while teachers instruct students to use their time wisely, they often fail to teach them how to manage their time effectively (Sahlberg, 2011). This approach, frequently called the "banking system of education," where students passively receive information, leads to a lack of proactive participation in learning (Freire, 1970). The traditional teaching method creates barriers to effective classroom interaction and hinders collaboration between teachers and students. Furthermore, this model often causes students to struggle to connect what they learn with their interests, negatively affecting their long-term personality development and career

prospects (Robinson & Aronica, 2015). As a result, the broader purpose of education is undermined, leaving it limited and disconnected from real-world applications.

1.2 Research Topic

The research title of this thesis is Brain-Based Learning: A Zenith Gateway to Achieve Educational Excellence. The research explores the teacher's understanding of practices, challenges, and scopes of Brain-Based Learning in private school education. Brain-based learning is an educational approach grounded in understanding how the brain processes, retains, and retrieves information. Defined as methods that align teaching techniques with the natural learning processes observed in the brain, this paradigm emphasizes creating environments that foster active engagement and emotional connections to enhance cognitive functions.

1.3 Statement of the Problem

According to Rahman, M. M., & Al Mahmud, A. (2016), in Bangladesh, many teachers use the 'Banking' method of teaching, which Paulo Freire brought up in the 20th century. This method has teachers giving lectures one way, where students listen and do not think critically or participate actively (Pundak, 2013). Students do not link classroom learning to real life or build crucial life skills.

According to Lauder, Hugh, et al. (2012), even with policy attempts to enhance education since the 1990s, encouraged by global efforts like Education for All and the Sustainable Development Goals (SDGs), the traditional 'Banking' method is still common in many classrooms. SDG Goal 4 aims to offer inclusive, fair, and quality education for everyone, from early childhood to

adulthood, focusing on developing skills and enhancing learning environments (The UN Bangladesh, 2023). Still, many schools in Bangladesh stick to old teaching methods. This situation particularly harms students, especially those from poor areas, with roughly 10.75 million primary school children living in poverty and lacking access to modern teaching aids like projectors and computers (Rafe, 2020). Public schools often depend on traditional approaches like textbooks and centralized materials, leaving students unacquainted with contemporary educational methods (Alam, 2020). The educational techniques include: student-centered approaches, task-based or Activity-based Learning, and project-based learning.

Many teachers do not dynamically recognize how incorporating brain-based learning (BBL) principles can lead to changes in both engagement and learning outcomes. Many teachers are still stuck in the rote memorization and lecture style of instruction rather than teaching students to develop critical thinking skills, real-world skills, or meaningful connections with the material (Marzano, 2007).

The research will explore what the teachers know about BBL, how teachers are implementing BBL in primary science classrooms (classes 3 and 4), and the challenges and obstacles they are facing. While BBL is a promising educational approach, there is still much to learn about how it is understood and implemented by English school teachers, especially in subjects like **science**. Research has shown that teachers often face challenges when attempting to implement BBL due to a lack of training, limited resources, and the time constraints of the curriculum (Bransford et al., 2000). Further studies are needed to understand the specific opportunities and challenges that teachers encounter in primary science classrooms. If the problem is not addressed, the quality of education may remain stagnant, and students may continue to miss out on learning opportunities

that are better aligned with the brain's natural processes for learning. Student engagement, critical thinking, and memory retention could suffer, limiting students' ability to succeed academically in the long term.

Understanding the disconnect between traditional teaching methods and how the brain learns is crucial for improving education quality, particularly in developing countries like Bangladesh (Sousa, 2017). Effective learning is about memorization and fostering more profound understanding and critical thinking. Brain-based learning (BBL) aligns teaching practices with how the brain processes and retains information, making it a valuable tool for enhancing student engagement and achievement (Jensen, 2008). Exploring the implementation of BBL in Bangladesh's English Medium School classrooms could lead to more effective teaching methods, improving learning outcomes, and helping students develop skills necessary for the future.

This research investigates how teachers in Bangladesh can be better trained to incorporate brain-based learning strategies into their classrooms. The study will examine existing teaching practices, identify barriers to implementing more interactive and engaging methods, and explore how modern technologies can be integrated into the classroom. The research will focus on uncovering the gaps in teacher knowledge and training related to BBL and suggest practical solutions for improving classroom dynamics. By understanding these challenges, the research will provide valuable insights into transforming the classroom to better align with students' learning needs and potential. Ultimately, the goal is to enhance the quality of education and promote sustainable development by improving teaching practices and learning environments.

Brain-Based Learning (BBL) is an educational strategy that maximizes cognitive function and improves educational outcomes by incorporating insights from neuroscience into teaching and

learning activities. The method is based on the knowledge that learning is a biological process and that people's ability to learn, process, and retain information is influenced by the structure and function of their brains. BBL aims to match instructional methods to the way the brain learns in its natural state, which is impacted by motivation, emotions, memory, and attention.

1.4 Purpose of the Study

This study explores the understanding and practice of brain-based learning (BBL) in our classrooms at different schools and how teachers apply this theory or integrate BBL in their lesson plans to get the best outcome.

1.5 Research Questions

This study is guided by three research questions, which intend to explore the Teachers' Perceptions of Brain-Based Learning in the Teaching and Learning Process at Private English Medium Schools.

1. What is the English Medium School's teachers' understanding of brain-based learning?
2. How is brain-based learning implemented in primary science classrooms (classes 3 and 4)?
3. What support and challenges do teachers confront while implementing brain-based learning in the classroom?

1.6 Significance of the Study

This research on brain-based learning contributes significantly to the existing body of knowledge, educational practices, and policies by providing deeper insights into how understanding brain function can optimize teaching and learning strategies. By integrating neuroscience with academic theory, this study highlights the potential of brain-based learning in enhancing cognitive development and improving student outcomes (Jensen, 2005). It offers valuable information for educators by emphasizing how brain science can inform instructional practices, helping teachers to tailor their methods to support better students' learning needs and styles (Caine & Caine, 1997).

From a policy perspective, this research underscores the importance of incorporating brain-based learning principles into school curricula and teacher professional development programs. Policymakers can utilize these findings to advocate for integrating neuroscience into education, ultimately fostering environments that promote cognitive development and holistic learning (Sousa, 2017). This study also encourages educational stakeholders, including administrators and curriculum developers, to prioritize applying brain-based strategies in schools to create more engaging, effective, and equitable learning experiences (McTighe & Willis, 2019).

For students, the study highlights how brain-based learning strategies can directly impact their engagement, motivation, and retention of information, leading to improved academic performance and overall development (Shaywitz, 2003). By bridging the gap between neuroscience and educational practice, this research empowers educators and students alike to adopt evidence-based approaches that maximize the learning potential of every individual.

Through this study, I will be able to explore the experiences and the challenges of the teachers, which will help the different stakeholders of educational departments and the policymaker to improve and incorporate their policies while implementing brain-based learning to understand the function of the brain to transform the traditional classroom into a place of meaningful learning. Understanding the BBL has the potential to alter the foundation of education, transform conventional classrooms into interactive learning environments, and promote better instructional approaches among teachers.

1.7 Summary

The limitations of conventional "banking" techniques, in which pupils passively absorb knowledge, are examined in this study to determine how brain-based learning (BBL) could enhance education in Bangladesh. It emphasizes the need to match instructional strategies to how the brain processes and remembers information, underscoring the need for more dynamic, captivating, and critical thinking-based learning settings. The study's primary goal is to train teachers to incorporate BBL into their classrooms while identifying obstacles and ways to improve instruction. By enhancing learning results, student involvement, and general teaching methods, the project hopes to advance a more efficient and just educational system.

Chapter 2

Literature Review and Conceptual Framework

2.1 Overview

In this chapter, I looked at different sources of information from books, articles, and documents about Brain-Based Learning methods. I carefully studied what teachers think about using Brain-Based Learning methods in teaching and how they are used in classrooms. I studied theories relevant to BBL methods and their implications. I went through these materials to help with my ongoing research, where I'm analyzing the resources, creating a guide for interviews, and writing a discussion. I've organized this chapter into different parts with a clear structure: Brain-Based Learning methods (BBL), the Relation between BBL and cognitive and experiential learning, the implementation of BBL and students' progress in the teaching-learning process and how BBL promotes sustainable knowledge and gaining in 21st-century skills, existing Support of BBL and the teaching-learning process, Challenges of BBL and teaching-learning process, and conceptual framework.

2.2 Brain-Based Learning

Brain-based learning focuses on activities that allow students to be active while learning. It can also improve classroom behavior and promote a positive learning environment by enhancing creativity and eagerness (Jensen, 2005). When the teachers apply brain-based teaching-learning methods in their classroom, the students will benefit from the diverse learning style, which is different from the traditional approach where students are treated like a bank to be deposited into. The research on neural plasticity, as well as other research (Diamond, 1994), tells us that the body and mind are interconnected. It also helps to develop a sense of a student's ability to

understand and regulate their emotions. Thus, I have chosen this topic to gain more knowledge through different studies (Yang & Damasio, 2007).

BBL focuses on creating environments that support memory retention, critical thinking, and creativity by utilizing techniques that reflect the brain's natural learning processes (Caine & Caine, 1991). The twelve principles are:

1. The brain is a parallel processor, meaning it can perform several activities simultaneously, like tasting and smelling.
2. Learning engages the whole physiology.
3. The search for meaning is innate.
4. The search for meaning comes through patterning.
5. Emotions are critical to patterning.
6. The brain processes wholes and parts simultaneously.
7. Learning involves both focused attention and peripheral perception.
8. Learning involves both conscious and unconscious processes.
9. We have two types of memory: spatial and rote.
10. We understand best when facts are embedded in natural, spatial memory.
11. Learning is enhanced by challenge and inhibited by threat.
12. Each brain is unique.

2.3 The Relation between BBL and Cognitive

Brain-based learning stresses how the brain receives and retains information through active engagement and real-world experiences. Brain-based learning (BBL) is closely related to

cognitive and experiential learning theories. Cognitive learning theory suggests that learning involves the active construction of knowledge, where learners build mental representations and make connections based on their experiences. Similarly, BBL supports this idea by integrating strategies that foster deep processing and memory retention, such as problem-solving, critical thinking, and collaborative learning, which align with how the brain naturally functions (Jensen, 2008).

Cognitive learning is a theory of learning that focuses on the mental processes involved in acquiring knowledge and understanding. It emphasizes how individuals actively process, store, and retrieve information, rather than passively receiving it. This approach to learning involves higher-level cognitive functions such as thinking, memory, problem-solving, and decision-making. Cognitive learning theories suggest that learners construct their understanding by connecting new information to existing knowledge, using strategies like organizing, analyzing, and reflecting on information (Ormrod, 2016).

Cognitive learning views learning as an active, mental process where learners learn to organize and make sense of the information they encounter, rather than simply memorizing or repeating it. Thus, Brain-based learning (BBL) supports cognitive learning by aligning teaching strategies with how the brain processes, stores, and retrieves information, thereby enhancing cognitive functions like attention, memory, and problem-solving. BBL emphasizes active engagement, hands-on experiences, and emotional connections to content—key components that promote cognitive learning processes and deepen understanding. For example, BBL incorporates techniques such as spaced repetition, collaborative learning, and real-world applications, which help to improve memory retention and enhance the ability to transfer knowledge to new contexts (Jensen, 2008).

Through these brain-friendly strategies, BBL promotes critical thinking and encourages learners to think critically and actively construct knowledge rather than passively absorb it. This active engagement facilitates cognitive development by making learning more meaningful and accessible, allowing students to organize and connect information, which leads to more effective learning outcomes.

2.4 The Relation between BBL and Learning by doing

In contrast, learning by doing emphasizes the learning process of the learners. Through practical exercises, introspection, and application, students can directly interact with the material. BBL promotes this approach and improves comprehension and retention. Using these two learning models together in BBL creates an environment where cognitive and learning by doing can happen, which leads to better long-term learning outcomes (Kolb, 2015).

According to Edelenbosch, R. Kupper, F. Krabbendam, and L. Broerse, J. (March 2015), when teachers implemented brain-based learning methods in the classroom, the students' knowledge and academic performances increased.

According to Schenck (2003), when teachers are willing to teach and learn simultaneously, they can help students gain practical and sustainable knowledge. Thus, by adding brain-based teaching and learning methods to their pedagogy, the students gain “Aha!” moments and unlock a new level of their lives through learning by doing.

2.5 BBL and Teaching Learning Process

Class lessons should not just involve memorizing words or facts. Teachers should use activities and lessons to help students learn how to problem solve and develop critical thinking skills that

will benefit them for their entire academic career (Kiewra, 2002). Thus, In a BBL classroom, the teacher is no longer the sole source of knowledge; instead, the teacher facilitates learning by creating opportunities for students to actively participate, collaborate, and make sense of the material themselves.

Jensen (2005) highlights that in a brain-based learning classroom, the teacher becomes the "guide on the side" rather than the "sage on the stage," allowing students to take an active role in their education.

This method enables a more individualized and successful learning experience by concentrating on each student's unique learning needs, utilizing past knowledge, and promoting teamwork (Caine & Caine, 2020). In addition to encouraging a deeper comprehension of the material, this change gives pupils the critical thinking and problem-solving abilities that are crucial in today's society.

Brain-based learning principles explain how and under what conditions the learner's brain catches the pieces of information, processes, and memorizes best, as educators or teachers employ different classroom instructions to enable other students to gain knowledge and concepts or solve problems (Chen, n.d.). BBL, which stresses the incorporation of neuroscience findings into teaching methods, is in fact a relatively new idea. Collaboration between educators and neuroscientists is crucial for the successful implementation of BBL because knowledge of how the brain processes information may greatly enhance teaching strategies and support students in realizing their academic potential. Working together is essential to creating curricula and activities that interest students and take into account the way the brain learns.

According to Caine and Caine (2020), "Educators and neuroscientists must collaborate to develop learning environments that maximize the brain's learning potential to implement brain-based learning principles." Teachers can create more efficient, research-based teaching methods that cater to the various cognitive needs of their pupils by fusing educational strategies with neuroscience.

This notion is further supported by research by Sousa (2017), who highlights the necessity for ongoing cooperation between educators and neuroscientists to ensure that teaching strategies are based on the most recent findings in brain science to optimize the advantages of brain-based learning.

2.6 Role of BBL in availing 21st-century Skills and Sustainable knowledge

Brain-based learning (BBL) is essential for equipping students with knowledge that will last and for preparing them for the challenges of the twenty-first century. By incorporating neuroscience ideas into instructional strategies, BBL promotes social interaction, emotional connection, and cognitive engagement. These elements are critical for the development of life skills as well as academic knowledge. These abilities, which are crucial for overcoming the difficulties of a world that is becoming more complicated and changing quickly, include critical thinking, teamwork, problem-solving, and creativity.

The kind of learning that students retain over time and enable them to build upon prior information throughout their lifetime is known as sustainable knowledge. By utilizing the brain's innate mechanisms for memory retention, meaning-making, and problem-solving, BBL advances sustainable knowledge. According to research, students' brains develop stronger neural

connections and learn more effectively when they actively participate in the process, such as through problem-based learning or hands-on activities (Sousa, 2017).

Teachers can create lasting learning experiences, too, by implementing BBL concepts like spaced repetition and emotional involvement. Jensen (2005) asserts that "students are more likely to retain information and develop the skills to apply it in different contexts when they are emotionally and socially engaged in learning."

The competencies that students need to thrive in the global, technologically advanced, knowledge-based economy are referred to as 21st-century skills. These consist of:

1. Problem-solving and critical thinking- By giving kids the chance to examine, assess, and generate new ideas, BBL promotes higher-order thinking in them. BBL fosters students' critical thinking and problem-solving skills by incorporating real-world issues and collaborative learning experiences into the curriculum (Caine & Caine, 2020). One important component of BBL, project-based learning, for example, allows students to investigate real-world problems, developing their critical thinking and creative problem-solving skills.
2. Collaboration and communication- Since the brain is structured for social interaction, BBL acknowledges that teamwork improves learning. Group work, peer evaluation, and cooperative problem-solving are all components of BBL, which equips students to collaborate well with others and express themselves clearly. In addition to improving their cognitive capacities, this aids in the development of the social skills required for professional success (Jensen, 2005).

3. Innovation and Creativity- By giving children the opportunity to participate in immersive, hands-on learning that sparks curiosity and inquiry, BBL promotes creativity. BBL fosters the innovative attitude required for success in the twenty-first century by offering settings where students can experiment, develop, and participate in activities that call for critical and creative thinking. "When students are given the freedom to experiment and explore, they develop the creativity needed to adapt to future challenges," according to Caine and Caine (2020).
4. Technological Proficiency and Digital Literacy- Being technologically savvy is crucial in today's environment. Because BBL places a strong emphasis on incorporating technology into the classroom, students can gain experience with digital technologies that will be essential to their future employment. Involving students in more dynamic and multimodal learning experiences, interactive learning environments, multimedia tools, and educational apps can enhance BBL (Sousa, 2017).

BBL supports the social, emotional, and cognitive abilities required for success in the linked world of the twenty-first century. The practical problem-solving, critical thinking, and teamwork skills that are essential for succeeding in the future are the main emphasis of this student-centered, active learning method. "The modern classroom must teach students how to think, not just what to think," as Sousa (2017) states, highlighting the significance of cultivating the abilities required to thrive in a constantly shifting global world.

2.7 Challenges of BBL

Many teachers find it difficult to transition to student-centered techniques like BBL since they are used to traditional ways. Teachers may find it challenging to embrace and successfully apply

BBL techniques due to this resistance to change, especially if they are not properly trained (Jensen, 2005).

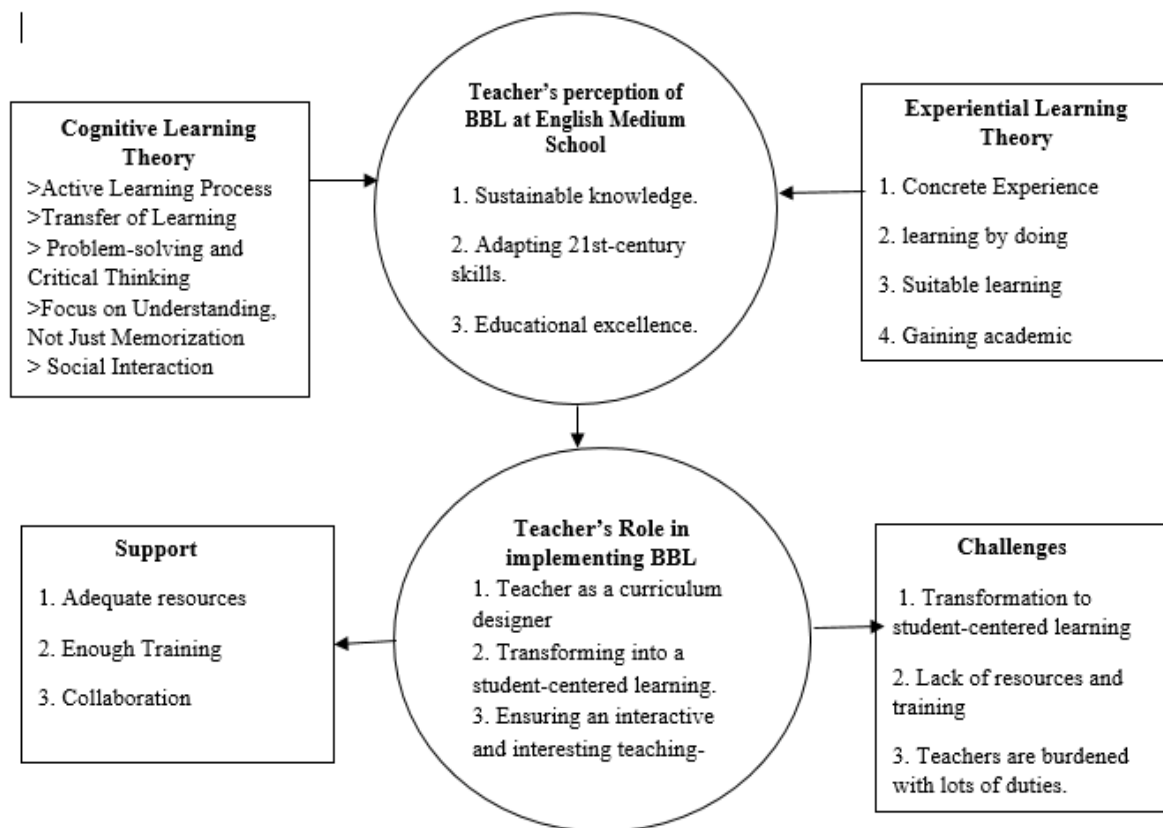
Lack of agreement may cause misunderstandings or incorrect interpretations of the results, leaving educators unsure about how best to use BBL concepts in the classroom. As Sousa (2017) notes, the quick advancement of brain research makes using BBL techniques in the classroom much more challenging.

Another major obstacle to the effective use of BBL is the lack of resources and training. Lack of resources, such as technology, supplies, and chances for professional growth, is a problem for many schools. Teachers might not be ready to successfully incorporate BBL into their classrooms if they lack the required resources and training (Caine & Caine, 2020). Furthermore, because BBL tends to focus on basic brain concepts, which might not always meet the specific needs of every student, especially those with learning impairments, it might not always address the individual variances in learning demands (Caine & Caine, 2020).

Finally, instructors may find it more difficult to completely adopt BBL if they are under pressure to adhere to curricular rules and standardized testing requirements. Teachers may lack the time or resources necessary to fully apply BBL because of the emphasis on academic goals, which frequently leads them to put content delivery ahead of creative teaching techniques. Teachers must strike a balance between the requirements of standardized tests and the necessity for innovative and successful teaching strategies, as Sousa (2017) points out.

2.8 Theories Related to BBL

I have discussed the cognitive theory of Swiss developmental psychologist Jean Piaget (1896–1980) and the experiential learning theory of David Kolb (1984), to delve further into how teachers view the use of BBL in the English Medium School, shown in the theoretical framework below. Through my study, I wanted to understand teachers' ideas and knowledge of implementing brain-based learning in their classrooms.



2.8.1 Cognitive Learning Theory

Cognitive learning theory is a psychological theory that focuses on the information around us and our internal memory. It was developed by Jean Piaget, a psychologist who defined schemata as the basic unit of knowledge. According to him, learning is a process. When we are exposed to our environment, we learn better. When we face a problem, we automatically start to find a

solution to that problem. Through this process, we gain knowledge and become more creative. The cognitive learning is based on the following points:

Active Learning Process

According to cognitive learning theory, learning is an active process in which students interact with, organize, and interpret knowledge rather than merely absorb it (Anderson & Krathwohl, 2001).

Mental Imagery

To arrange and store information, learners develop mental models or schemas. These mental images aid students in understanding the world and applying what they have learned in various situations (Piaget, 1952).

Constructivism

Constructivism is frequently linked to cognitive learning, in which students comprehend new material by drawing on their past experiences and knowledge. It is believed that learning is more than merely memorizing facts; it is a process of creating meaning (Vygotsky, 1978).

Critical Thinking and Problem-Solving

The development of critical thinking and problem-solving abilities is emphasized by cognitive theory, which pushes pupils to overcome obstacles by applying logic and reasoning (Anderson, 2005).

Processing Information

According to this hypothesis, the mind functions similarly to a computer, processing information through a series of steps such as encoding, storing, and retrieving it. Memory and attention are essential for learning to be effective (Baddeley, 1992).

Cognitive Structures and Schemas

Schemas are frameworks that assist people in organizing and interpreting data. Students either integrate new material into their preexisting schemas or adapt it to fit into new ones as they come across it (Piaget, 1952).

Cognitive Development Stages:

Jean Piaget's developmental stages, which show how learners' cognitive capacities evolve, are frequently cited in the theory. These phases have an impact on how pupils see and engage with the outside environment (Piaget, 1952).

Transfer of Learning:

According to the theory, learning should be flexible and relevant for students to employ their cognitive abilities to solve new issues and transfer their knowledge and skills from one context to another (Anderson, 2005).

Put Understanding First, Not Memorizing:

The cognitive theory places more emphasis on in-depth comprehension than rote memorization. For students to apply their knowledge in a variety of contexts, they must grasp concepts at a basic level (Anderson & Krathwohl, 2001).

2.8.2 Learning by Doing Theory

In 1984, David Kolb stated that we learn better when we transform our real-life experiences into knowledge, which will be sustained in our memory for an extended period and take concrete form (Kolb, 1984). Thus, it connects with our brain, so when teachers apply brain-based learning theory in their classroom, the students can easily understand the lesson context through activities reflecting their prior knowledge. Learning happens when people go through four stages: Active Experimentation, Reflective Observation, Concrete Experience, and Abstract Conceptualization (Kolb, 1984). The following are important elements of experiential learning theory:

Concrete Experience- Reinterpreting an existing experience or having a new one.

Reflective observation is thinking back on the event, identifying changes, and comprehending what transpired.

Abstract conceptualization- Creating theories, conceptions, or ideas based on reflections is known as abstract conceptualization.

Active experimentation- It is the process of putting novel theories or notions to the test in practical settings to see how well they work.

2.9 Summary

The core tenet of cognitive learning theory is that learning is an active process in which students build new information from their experiences and existing knowledge. It focuses on memory, attention, and metacognition while fostering the growth of mental models, problem-solving skills, and critical thinking. This notion is essential for influencing contemporary teaching methods and encouraging in-depth comprehension and purposeful learning. Kolb's concept

emphasizes that people actively create knowledge by fusing new experiences with what they already know, rather than just absorbing it.

Chapter 3

Methodology

3.1 Overview

The research methodology is covered in Chapter 3, it gives a summary of the strategy used to look into how instructors in Dhaka's English-medium schools interpret and use Brain-Based Learning (BBL). The chapter describes the techniques used to obtain the data, which include semi-structured interviews and classroom observations. The data-gathering process also describes the procedures followed to guarantee participant permission and ethical consideration. By using a variety of approaches, collecting data from several sources, getting peer reviews, confirming data with participants, and keeping records and analyses up to date throughout the project, I have ensured my research was credible and rigorous. The chapter concludes with an illustration of the thematic analysis approach to data analysis.

3.2 Research Approach

In qualitative research, various social phenomena are thoroughly analyzed and justified.

Researchers choose a qualitative approach when they want to delve deeply into a complex and in-depth understanding of a subject (Creswell & Poth, 2018). Regarding its features, I interact directly with participants to collect data while it takes place in a natural setting. I used different varieties of techniques to gather data rather than depending on one format, guaranteeing a thorough approach (Rossman & Rallis, 2017).

I focused on learning how educators see and apply Brain-Based Learning (BBL) in their instruction at an English-medium school. I have to carefully consider the participants' points of view to fully understand them, given our particular situation (Rossman & Rallis, 2017). I decided

to use a qualitative approach for my research because of the wide range of perspectives and experiences about BBL adoption in various contexts. Qualitative research is characterized by the methodical collection, analysis, and interpretation of non-numerical data.

3.3 Research Site

Because the purpose of this study is to find out how English-medium schools perceive the Brain-Based Learning method, I have involved a variety of participants. Because of their varied accessibility and possible resources, I have decided to use English-medium schools in Gulshan and Malibag Thanas as my research sites. Examining how BBL is perceived in "teaching and learning processes" in English-medium schools is the aim. These schools were specifically selected to take into account variables including the availability of resources, socioeconomic differences in resource utilization, and instructors' opinions of certain demographic traits. Because of its accessibility, wide range of participants, and capacity to shed light on the study issues, this website is especially suitable. Because of its accessibility, wide range of participants, and capacity to shed light on the study issues, this site is especially suitable.

3.4 Sampling and Sampling Procedure:

The research participants were purposefully selected. Purposive sampling was employed in qualitative research to find and choose participants to make the best possible use of scarce resources (Palinkas et al., 2013).

According to Patton, M. Q. (2002), purposive sampling allows researchers to strategically choose a relatively small sample of

participants with specific characteristics that are most informative for their research question. This method prioritizes an in-depth understanding of the research topic. Researchers use their judgment to identify participants who can provide rich data, making it ideal for qualitative studies where exploring a topic in depth is key (Merriam & Grenier, 2019).

I needed the perception of the school's head teachers and teachers to investigate the problem. They might hold different perspectives, which was useful for the investigation. In this investigation, a total of six participants will be interviewed, comprising four Science teachers from English medium schools and two Head Teachers. Additionally, two to three classrooms were observed on two to three separate occasions.

Table 3.1 <i>Distribution of Participants by Area, Designation, and Gender</i>				
Area	Designation	Male	Female	Total
Gulshan	Science Teacher	1	1	2
	Head Teacher	1	0	1
Malibag	Science Teacher	1	1	2
	Head Teacher	0	1	1
Total		3	3	6

Note: A dash (-) indicates zero participants in that category.

3.5 Data Collection Methods

I used two kinds of data collection methods for this study:

1. In-depth Interview
2. Classroom Observation

In qualitative research, we use different sources of information to find common themes. We keep checking these themes to make sure they are derived from ‘Inductive Reasoning’ (Creswell & Poth, 2018). In this study, I interviewed subject teachers and Head Teachers. I also observed some classes where BBL methods were used. I wanted to understand how teachers' experience using BBL methods in the teaching process, what support they receive, and challenges they face with it.

3.5.1 In-depth interviews with science teachers and teachers’ training instructors

Individual interviews were conducted face-to-face to gather data through interpersonal engagement with the participants. During these interviews, participants shared their real-life experiences, allowing researchers to gain insight into their perspectives and the significance they attribute to these experiences (Creswell & Ploth, 2018). This is why I opted for In-person individual interviews. I explored the perceptions and viewpoints of English medium school teachers regarding the use of educational tools like diagrams, posters, or PowerPoint presentations, and videos in the teaching process, drawing from their classroom practices. Through these one-on-one interviews, I aimed to understand their perception of BBL and how they articulate their support for and challenges with educational tools based on their classroom experiences. Four English Medium Science primary teachers were engaged in these phone interviews, their classrooms also being observed. To facilitate this, I crafted an interview guide tailored for in-depth discussions. The guide for teachers’ interviews comprised two sections: Part A focuses on teachers’ demographic information, and Part B contains open-ended questions

concerning their perceptions, classroom practices, support, and challenges related to implementing the BBL in the classroom. The questions were structured around three key areas:

(i) Inquiries about teachers' perceptions of BBL in the teaching process, including queries such as "What are your thoughts on BBL?" and "What tools do you utilize, such as projectors, digital learning materials, presentation slides, and visuals, in your teaching and learning process?";

(ii) Exploring the implementation of BBL in English Medium Schools' classrooms, with questions like "How does the integration of BBL in the learning process impact students' overall learning experience?" and "What skills do you focus on while incorporating the BBL method in the teaching and learning process?"

(iii) Exploring opportunities and challenges associated with the BBL, with examples including "What challenges did you encounter during implementing BBL methods in the classroom?" and "What strategies do you envision to overcome these challenges?" Furthermore, additional probing questions were asked to extract detailed insights, such as "Can you provide an example?" and "Could you elaborate further?"

3.5.2 Classroom observation

Observation of classrooms serves as a primary method for gathering qualitative data, driven by the research objectives and inquiries. In this method, researchers explore the physical environment, participants, and their interactions (Creswell & Ploth, 2018).

In this investigation, I employed classroom observation to address two significant research

questions:

How are BBL tools currently being used in the classroom-based teaching-learning process?

What are the supports and challenges of implementing BBL tools in the classroom?

The observation sought to explore the integration process of BBL within teaching practices. The average class size consisted of approximately 20 students. Two classes, each taught by different teachers, were observed across two English-medium schools. The teaching of science subjects provided insight into the implementation process and teachers' perception of BBL. I maintained an observation protocol that focused on the appropriate use of the BBL tools, and their obstacles and assistance, to direct the observation process. Identifying the BBL tools used in the classroom, analyzing how tool designs were incorporated into lesson plans, and implementing classroom management techniques, such as monitoring student conduct and participation, were a few examples of checklist items. Additionally, I took some extra notes if needed.

3.6 Data Collection Process:

Before starting the data collection, I obtained consent from the selected participants. Subsequently, I arranged interview times that suited both parties, clearly outlining the study's objectives. Before each interview, I sought the participants' permission and informed them of the recording for future reference. Before initiating interviews with teachers, I scheduled appointments and provided consent forms. During the interviews, I explained the process and purpose of the research while also inquiring about their well-being to establish rapport. Following an informal approach, I posed questions regarding educational pedagogy, aiming for a natural and conversational interview. For instance, I asked, "What's your understanding of BBL?"

What tools do you typically use?" rather than the more formal "What's your opinion on the Brain-based learning method? Do you utilize BBL tools such as projectors, digital learning materials, presentation slides, and visuals in your teaching? If so, which tools?" The duration of each interview was 15 minutes on average, maintaining consistency for both groups of participants- assistant teachers and the head teachers.

For classroom observations, I communicated with the head teachers of the school and took the appointment of the subject teachers from the teacher with verbal permission from the head teacher. I kept the observation protocol with me and silently observed the whole class from lesson planning to student engagement and classroom strategies. I pointed out the students' behavior, classroom performance, and teacher instructions in my notebook to observe the class lesson from an all-encompassing perspective.

3.7 Data Analysis Process

I have used the 'Thematic Analysis' procedure for the data received from the interviews and Classroom observation. In a qualitative data set, thematic analysis looks for patterns of meaning. A thematic analysis combines different groups of data from vast data into categories based on commonalities, or themes. These themes assist us in understanding the information and deriving its significance (Creswell,2014). I adhered to the procedures outlined by Braun and Clarke (2006) for identifying themes.

1. *Acquaintance with the data:* Initially, I engaged in the comprehensive examination of the transcriptions, immersing myself in the data. Furthermore, I iteratively listened to the recordings to capture the inherent message and take relevant notes.

2. *Creating primary codes:* I carefully organized the data. I used color-coded annotations to classify distinct informational passages from the transcripts under my study questions. To do this, physical copies of the transcriptions were colored differently and arranged using particular codes.

Table 3.3 Generate Initial Quotes

Interview Extracts	Codes
Yes, certainly. By integrating real-life examples, audio devices, videos, and slides into my teaching, I can cater to the brain's natural learning preferences—engaging both the auditory and visual systems, reducing cognitive overload, and encouraging active participation. These strategies align with brain-based principles, making learning more effective and enjoyable for my students. (T1)	Visual aid
We can connect pupils to reality when we use these tools in the classroom. If a student has never seen a shark in person, we can simply play a film about it and help them identify the animal. We can guide students from the imagined to the real world through this approach. (T2)	Learning by doing
They yell with delight whenever I introduce any kind of images that produce sound into the classroom. This indicates that they are interested in this. As a result, they are more interested and attentive when technology is used. I clarify the topic with storytelling and showing pictures related to those stories.	Audio device with images

I'm getting better at organizing and executing my lessons. (T3)	
When they enjoy the class and feel connected with the teacher, they actively participate in the classroom activities and feel happy. (T4)	Suitable learning for students
Many schools do not have wifi, but ours does. We were required to work on various apps, including Zoom and Google Meet, during the COVID-19 pandemic. We established a WhatsApp group and distributed the link and schedule for the classes. At any time. My door is always open. For ease of usage, they are even set up in the classrooms, like TVs, projectors, and computers (HT1)	HT support Support in School
Every resource we use in traditional classrooms, including pictures, narratives, drama, and so forth, works better when used with a digital tool. Students understand the life cycle and different parts of the human body better when they can illustrate them with actual images rather than merely talking about them. (HT 2)	HT support Support in School

3. *Sub-theme exploration:* I divided the codes into broad subcategories. By way of

After careful analysis, *I assigned the codes to the appropriate sub-themes. For example:*

Code	Sub-theme
Visual learning	-Integration of laptops and digital screens

Slides	
Audio learning	- Utilization of audio devices for enhanced learning
Connection with the real world Use of materials	- Improved comprehension through multimedia content
Practices in lesson design Sustainable knowledge	- Learning is fun when students enjoy and participate in the classroom activities.
HT support Support in School	- Institutional support and resources

4. *Assessing the sub-themes:* To guarantee proper portrayal, I painstakingly documented all information of particular subcategories. I then incorporated them into more general themes. I went over each sub-theme again during this process to make sure they were in line with themes that were pertinent to

The questions of the study. For example:

Code	Sub-themes	Themes
● Connection with the Real-world learning by doing ● Use of materials	Sustainable learning through Audio and visual aids	Teachers' perception of the Impact on BBL tools

5. *Themes clarification:* To guarantee an accurate portrayal, I improved the themes. For instance, to better understand how teachers and students perceive the teaching and learning side of the process, I considered breaking down the themes of "Teachers' Perceptions of BBL learning methods" and "Current Practices in the Classroom" into multiple categories, such as the effects on teachers and students independently.

6. *Documentation:* Finally, I included the developed themes in the report's analysis and outcomes sections.

3.8 Ethical concerns and issues

Participants' informed consent, as well as the consent of parents or guardians in the case of minors, must be obtained by the researcher. Additionally, the volunteers will have the freedom to leave the study at any moment and will be protected from any bodily or psychological injury (Johnson, B., & Christensen, L., 2004).

Prior to conducting any interviews or setting up group discussions for the participants, I obtained their consent. Pseudonyms were used as necessary, and their information was kept private. Consent was acquired from the guardians of minor participants. There were no biased opinions or contributions made before, during, or after the data collection process, or when the data was being interpreted.

3.9 Credibility and Rigor

In research, credibility relates to the readers' assumption that all study findings are reliable and correct. However, "the researcher is being thorough, responsible, reasonable, and accurate" is what is meant by rigor (Williams & Kimmons, 2022).

Triangulation, peer debriefing, member checking, and prolonged participation are ways to establish credibility and rigor. Long-term participation can be ensured by allocating sufficient time and energy to the fieldwork and data analysis procedures. A powerful triangulation format can be created by combining several techniques and data sources. When developing research instruments, peer debriefing might be beneficial. Participants may offer any necessary adjustments or explanations through the member verification process (Williams & Kimmons, 2022).

In my research, I ensured credibility through utilizing varied methodologies, seeking feedback, verifying data, and maintaining a clear record.

Triangulation- Triangulation was employed to enhance the credibility and trustworthiness of the study. Data were collected from multiple sources and through different methods to allow for cross-verification of findings. Specifically, data source triangulation involved gathering perspectives from English Medium teachers and head teachers regarding the integration of Brain-Based Learning (BBL). In addition, methodological triangulation was achieved by combining individual semi-structured interviews with classroom observations. The convergence of data from these sources and methods enabled a more comprehensive understanding of teachers' perceptions and practices related to the integration of BBL in the teaching-learning process.

Validation - I engaged in discussions with a colleague who serves as a research staff member, reviewing the alignment of data collection methods with research objectives and preliminary interpretation of findings. Furthermore, oversight and feedback were provided by my

academic supervisor.

Member checking - I shared interview recordings and observation records with the participating teachers to ensure that the study accurately captured their perspectives.

Audit trial - Before initiating my thesis, I conducted an extensive literature review to identify research gaps. This involved scrutinizing numerous scholarly works and documents. Drawing from this review, I formulated methodologies, such as interviews to explore teachers' perspectives and classroom observations to assess their practices. Pilot interviews were conducted to refine data collection tools based on participant feedback. Subsequently, data analysis involved a thorough examination to extract key themes and sub-themes. Finally, in the discussion chapter, I contextualized my findings with existing literature, extracting points of alignment and nonalignment while considering all of the data.

3.10 Limitations of the study

I've already taken several steps to enhance the credibility and trustworthiness of the study. However, there are still some additional measures that could further strengthen my research:

1. Mixed-Methods Approach: Integrating quantitative data, such as surveys or standardized test scores, alongside qualitative data from interviews and observations, could provide a more comprehensive exploration of the use of EdTech and teachers' perspectives on it regarding student engagement and learning outcomes.

2. *Peer Review*: Seeking feedback from external experts or peer reviewers on the research design, data collection methods, and analysis procedures could help identify blind spots or areas for improvement, enhancing the rigor and validity of the study.

3.11 Summary

This chapter explains the research approach, research site, sampling procedure, data collection methods, and thematic analysis process. The chapter explores the qualitative nature of the study, emphasizing the depth and richness of information. Through purposive sampling, diverse perspectives of teachers and head teachers from English Medium Schools were derived, contributing to an understanding of BBL pedagogy utilization in English Medium Schools. The employment of semi-structured interviews and classroom observation facilitated the gathering of rich data to answer the research questions. Ethical considerations were meticulously addressed, ensuring participant consent and confidentiality. Overall, Chapter 3 serves as a methodological exploration, guiding the research journey towards the generation of nuanced insights into teachers' perceptions and practices concerning BBL pedagogy in English Medium Schools.

Chapter 4

Result

4.1 Overview

The results chapter focuses on key themes related to English-medium school teachers' perceptions of educational pedagogy or method (BBL) tools, their current practices, and the associated support and challenges. I conducted a thematic analysis of the data on the institutional support they receive and their perceptions of educational methods, examining it through the lenses of challenges and opportunities.

Table 4.1

Themes and Subthemes

Perception of Teachers on BBL	Teachers' practices and Experiences with BBL	Challenges for effective implementation	Support for the Teachers
- Increased student interest and participation - Improved comprehension through multimedia content - Alignment with diverse learning styles	- Usage of BBL tools - Importance of Wi-Fi access - Enhanced efficiency in lesson delivery - Reduction in content preparation time	- Lack of teacher training and skills - Insufficient technology resources and large Classrooms - Time constraints and heavy workloads	- Access to BBL Tools - Ongoing Training Programs and Peer Support

	- Improved teaching effectiveness		
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4.2 Perception of Teachers on BBL Method:

4.2.1 Increased student interest and participation:

BBL tools captivate students' attention and foster active engagement in the learning process. Teacher 4 observed, "They feel a lot of amusement. When they can see the visuals slide by slide, it becomes easy" (Interview 4).

Teacher 3! When I teach students, I draw on various forms of educational technology to support their learning, particularly by leveraging tools that align with brain-based learning methods. The brain-based learning approach emphasizes the importance of creating environments that stimulate and engage the brain, facilitating more effective learning.

For instance, I incorporate audio devices like microphones or sound systems to ensure that my voice reaches every student clearly, especially in larger classrooms. According to brain-based research, clear auditory input is crucial for attention and memory retention. When students can easily hear the material being taught, it helps them stay focused, reducing cognitive overload and enabling them to process the information more efficiently. Audio tools also support multisensory learning, which engages both auditory and visual pathways in the brain, enhancing memory and understanding.

To keep students engaged and increase their attention, I often use videos and slides as part of my teaching strategy. Videos tap into the brain's preference for visual learning, activating the occipital lobe and making information more memorable by showing it in action. The brain is naturally wired to respond better to moving images and real-life examples, which is why videos

are highly effective in reinforcing concepts. Whether it's a science experiment, a historical reenactment, or an animated breakdown of a complex theory, videos help the brain make stronger connections and increase retention rates.

Teacher 2 highlights this aspect, stating, "Students receive the learning very easily. While taking traditional classes without preparing content (digital), it becomes difficult for us to make the students understand the topic."

From the classroom observation, students seemed to be very captivated by the digital content that was demonstrated to them. In one of the grade 4 classes, students were very joyous while chanting poems alongside a video that was playing on the audio device.

4.2.2 Improved comprehension through multimedia content:

Visual and auditory elements in BBL tools facilitate better understanding and retention of educational material. Teacher 2 noted, "The students receive the learning very easily" (Interview 2).

Moreover, the integration of interactive elements, such as videos, colorful images, and audio clips, facilitates deeper understanding and retention of concepts. Teacher 4 provides an illustrative example, stating, "For example, when I was teaching a poem on the Rainbow, I prepared the letters based on the 7 colors of the rainbow. It created a lot of interest among the students." By leveraging BBL tools, teachers bridge the gap between abstract ideas and real-world applications, thereby enhancing student comprehension and engagement, causing sustainable learning.

4.2.3 Alignment with BBL learning styles:

BBL tools cater to varying learning preferences, effectively accommodating visual, auditory, and kinesthetic learners. Head Teacher 1 highlighted, "All of the materials that we use in our traditional classrooms, such as images, stories, drama, etc, are more effective when we use these materials through a digital tool" (Interview 3).

Teacher 2 expressed that "It is significantly beneficial to the students who have a learning gap. The remedial intervention can be covered easily for the lagging behind students."

Teacher 1 stated, "When I use videos, pictures, and audios, even the inattentive students become spontaneous and attentive. By this process, I believe I can easily achieve the learning outcome."

Furthermore, teachers utilize a variety of digital resources, including videos, audio clips, and online platforms, to augment traditional teaching materials. Teacher 4 elaborates on this practice, mentioning, "Generally, I use video content for teaching the content." This multifaceted approach not only caters to diverse learning styles but also cultivates an immersive learning environment that promotes active student participation and collaboration.

4.3 Teachers' practices and experiences with BBL:

4.3.1 Usage of Educational Technology:

Teachers across interviews emphasized the extensive use of PowerPoint presentations, multimedia projectors to show videos and diagrams in delivering educational content. Teacher 2 mentioned, "In the case of technology, we use multimedia (projector) predominantly" (Interview

2). Teacher 4 describes the positive impact of visual aid content, noting, "Students can easily get the learning through visuals from the screen through a projector."

Videos and diagrams shown through laptops and digital screens complement traditional teaching methods, offering dynamic visual aids. Teacher 4 highlighted, "Then came the videos, sound, and diagrams." (Interview 4).

Audio devices are employed to ensure clear audio transmission during multimedia presentations, contributing to improved comprehension. Head Teacher 1 stated, "We have 3 projectors, 4-5 audio devices." (Interview 3).

Wi-Fi access facilitates the incorporation of online resources and communication tools, enriching the teaching-learning process. Head Teacher 2 noted, "For including technology, we need wi-fi" (Interview 4)

4.3.2 Enhanced efficiency in lesson delivery:

Visual and audio tools enable teachers to cover curriculum content more efficiently, resulting in improved time management and increased productivity. Teacher 4 mentioned, "If I need to finish a lesson within 7 days, I can finish the lesson in 2 days if I use a visual aid related to that specific topic." (Interview 4).

Teacher 2 said, "If I have prepared a lesson and executed it in the classroom (with BBL tools), the teacher has to talk less, and it gets easier to make the students understand easily." From classroom observation, it was found that classroom management was efficient because of the use of BBL tools. In the grade 5 classroom, a group work on identifying healthy foods from images was conducted smoothly in the class.

4.3.3 Reduction in content preparation time:

Despite initial preparation requirements, teaching with BBL tools like videos, diagrams and audios often results in shorter lesson delivery times and smoother classroom experiences. Teacher 3 noted, "My task is becoming easy, and I am becoming more productive. The outcome or result of the class is way better than the normal classes. (Interview 3).

Teachers also get support from the school for online resources, from which they can prepare their classroom lessons. Teacher 1 described, "There is a teacher ID in the online platform called 'Cambridge resources hub', in which the lessons are organized and demonstrations are given. So, even if we don't prepare the lesson, we can watch or download the videos from that site."

However, a different perspective about the online resources came from another HT. While talking about the existing digital content support for the teachers, HT 1 pointed out, "There is a lot of content in our 'Cambridge resources hub' (an online portal), but the content is not in an organized manner. If we could structure the lessons based on chapters and lessons, we could use them easily."

4.3.4 Improved teaching effectiveness:

Teachers perceive BBL tools as effective aids in content delivery, resulting in more engaging and impactful teaching practices. Teacher 3 stated, "My lesson execution is becoming easier and structured" (Interview 3).

Head teacher 2 noted, "When I take traditional classes, I can achieve the learning outcome for only 80% of the students. But when I use digital content, I can achieve the learning outcome for 100% of the students." (Interview 4).

4.4 Challenges for Implementation

4.4.1 Lack of teacher training and skills:

Many teachers lack the necessary skills and training to effectively integrate BBL tools into their teaching practices, hindering implementation efforts. Teacher 3 mentioned, "As far as I know, no one has received any training till now. I don't know if anyone has received any training, to my knowledge." (Interview 3). He also added, "The other private sector can help here with the training. If I want to take the training from the school, it will be very late."

Teacher 2 emphasizes the importance of building confidence in using BBL tools, stating, "There is a fear of trying out new things."

Teacher 1 mentioned, "We need to identify the challenges of using BBL tools in the classroom. We need to come forward with government and non-governmental initiatives." (Interview 4).

Teachers require thorough and continuous training on computer literacy and BBL tools to enhance their skills and confidence in using technology in the classroom. Head Teacher 2 stated, "To me, for taking such classes, a teacher must have a good skill in browsing the internet" (Interview 3).

Teacher 2 emphasizes the significance of training, stating, "The teachers will be able to contribute a lot if they are provided with training on technology."

4.4.2 Insufficient resources and poor Wi-Fi connection:

Schools often face challenges in providing adequate access to BBL tools, limiting the use of computers, television, or wi-fi in classrooms. Teacher 2 noted, "We have more than 50 classrooms in our school, but there are only 2 multimedia projectors" (Interview 2).

There is a need for better maintenance and updating of multimedia tools, as Head Teacher 1 pointed out, "But due to the change of Vice-principal and less budget, the board expired."

Teacher 4 also pointed out the same issue, "The main challenge is the excessive number of students. On the other hand, I need a fair amount of time to prepare the content. For this, I need a gap. But we cannot afford the gap due to a lack of enough teachers. So we need more Teachers. If we can have a gap, we will be able to perform more spontaneously."

In the classroom observation, it was identified that the sound of the audio from the device.

It was not clear to the whole classroom, resulting in chaos and confusion.

4.5 Support for the Teachers:

4.5.1 Access to BBL Tools:

Most teachers mentioned having access to multimedia projectors. Teacher 4 noted, "From our principal, in the case of tools, we received a multimedia projector first."

Head Teacher 1 told, "In our school, we have a projector, audio device, and multimedia digital board. I used to enjoy using the multimedia digital board in my classroom. These tools are available to facilitate the preparation and delivery of digital content. Teacher 4 highlighted, "Then came the laptop, sound box, and digital screen. These four tools are there for us to use."

Teacher 4 emphasized the importance of having access to school Wi-Fi, noting, "For

Including technology, we need Wi-Fi. Our school provides Wi-Fi, which many schools don't have."

Head Teacher 1 indicated that teachers have open access to technological tools, saying, "Anytime. I always keep my door open. They are even set up in the classes, so that they can use them easily."

4.5.2 Ongoing Training Programs and Peer Support:

Teachers received specific training on how to use Information and Communication Technology (ICT) to edit videos, PowerPoint presentations, and relevant diagrams and audio clips.

Teacher 4 shared, "For creating the contents, I got a 12-day training on PowerPoint. I keep that learning with me dearly and trying to apply it in my teaching."

Teachers also mentioned holding Cluster-Based Retraining Opportunities that they received previously. Head Teacher 1 mentioned the importance of ongoing training, stating, "We have to arrange retraining opportunities for them on a cluster basis, as we previously had."

Teachers often help each other with technology use. Head Teacher 2 observed, "As there is a lack of skills, teachers face challenges and have to seek the help of other teachers who have the skill and knowledge."

4.6 Summary:

The chapter explores English medium school teachers' perceptions and experiences with the educational method (BBL), highlighting increased student engagement, improved comprehension, and alignment with diverse learning styles. Teachers benefit from using brain based learning tools for efficient lesson delivery and enhanced teaching effectiveness, but face

challenges such as inadequate training, insufficient technology resources, and time constraints. Despite these challenges, access to BBL tools, and ongoing training programs provide crucial support, underlining the need for continued professional development and institutional backing to optimize BBL principles integration in education. In sum, by integrating audio devices, videos, and slides into my teaching, I can cater to the brain's natural learning preferences—engaging both the auditory and visual systems, reducing cognitive overload, and encouraging active participation. These strategies align with brain-based principles, making learning more effective and enjoyable for my students.

Chapter 5

Discussion and Conclusion

5.1 Introduction

This chapter aims to analyze the findings associated with the research questions. This chapter includes a discussion of English Medium School teachers' perceptions of BBL, their current classroom practices, and the support and challenges associated with implementing these methods. Furthermore, the chapter provides recommendations based on the analysis to enhance the effective integration of BBL in the teaching-learning process.

5.2 Discussion

English Medium School teachers recognize the great impact of BBL methods on student engagement and learning outcomes. By embracing innovative approaches to teaching and leveraging digital resources effectively, educators can create dynamic and inclusive learning environments that empower students to thrive in the 21st century. Through targeted support and a commitment to overcoming challenges, English Medium schools can harness the full potential of technology to enrich the educational experiences of all students.

Research Question 1: What is the English Medium School's teachers' understanding of brain-based learning?

English medium school teachers generally perceive EdTech tools positively in the teaching-learning process. They observe that BBL significantly increases student interest and

participation, making lessons more engaging. According to Keengwe et al. (2008), teachers noted that incorporating brain-based learning tools like videos, multimedia and pictures in classrooms greatly enhanced student engagement and participation. They found that visual and auditory components helped students understand and remember the material more effectively. (Keengwe, Onchwari, & Wachira, 2008).

Teachers reported that visual and auditory elements facilitate better understanding, and as BBL tools cater to various learning preferences, and help them to prepare their lessons with activity-based content. These tools enable teachers to create more dynamic and interactive lessons that appeal to a broader range of students and effectively achieve sustainable learning outcomes. Ruggiero and Mong (2015) found that Teachers who integrated Multimedia, videos, and pictures in their classrooms observed increased student interest and participation. Utilizing BBL tools enabled a more interactive and dynamic approach to lesson delivery, thereby enriching student learning experiences (Ruggiero & Mong, 2015).

Research Question 2: How is brain-based learning implemented in primary science classrooms (classes 3 and 4)?

Teachers are actively incorporating BBL tools into their teaching practices in several ways. They predominantly use scientific diagrams, videos, and PowerPoint presentations to deliver educational content, which helps in presenting dynamic visual aids that complement traditional teaching methods. A study by Keengwe and Onchwari (2009) highlighted that Teachers employ diagrams, videos, activities, and PowerPoint presentations to present content, thereby fostering interactive and captivating lessons. The incorporation of these tools has aided

in the efficient management of class time and the thorough coverage of curriculum content (Keengwe & Onchwari, 2009).

Similarly, slides provide a visual structure to the lesson, helping students organize information in a way that aligns with the brain's natural tendency to process information visually and sequentially. The use of text, images, and diagrams on slides taps into the brain's preference for chunking—grouping related information to make it easier to understand and retain. This visual structure helps students create mental maps of the content, improving comprehension and recall.

Furthermore, these technologies foster active engagement, another key principle in brain-based learning. The brain learns best when it is actively involved in the process, so by using interactive elements like polls, quizzes, or collaborative activities, I encourage students to actively participate. This not only helps maintain their focus but also strengthens neural connections, as students are required to process and apply the information in real-time.

The use of audio and video incorporated in the lessons to explain the human digestive system or demonstrate relevant images, visuals through presentation slides ensures sustainable learning for the students. The research by Batane and Ngwako (2017) indicated that the utilization of online resources like videos, images, and diagrams by educators enhances the teaching-learning process, providing access to a broad array of educational materials and tools (Batane & Ngwako, 2016).

BBL tools have improved lesson delivery efficiency, enabling teachers to cover curriculum content more quickly and manage their time more effectively. The study by Hsu (2016) found that integrating BBL tools such as activities, presentation, videos, images, and diagrams, multimedia-enhanced lesson delivery, and enabling teachers to transfer the classroom from

traditional or teacher-centric to student-centered classrooms effectively. Consequently, this led to smoother and more productive classroom experiences (Hsu, 2016).

Research Question 3: What support and challenges do teachers confront while implementing brain-based learning in the classroom?

To present the videos, audio, presentation, and diagrams, teachers generally have access to devices like multimedia projectors, laptops, digital screens, and Wi-Fi, which are provided to facilitate the preparation and delivery of digital content. Furthermore, teachers receive limited and specific ICT training and participate in cluster-based retraining opportunities, which help them develop the necessary skills to use technology effectively. Peer support also plays a significant role, with teachers assisting each other in overcoming technological challenges. The research by Atabek (2019) underscores the importance of peer support and continuous professional development to help teachers overcome technological challenges and effectively integrate BBL tools into their teaching practices (Atabek, 2019).

Despite the support, there are notable challenges. Many teachers lack the necessary training and skills to effectively use the devices to prepare digital content, videos, and PowerPoint presentations, which can hinder implementation efforts. Schools often face difficulties in providing sufficient resources, limiting the extent to which BBL tools can be utilized in classrooms. Teachers are burdened with lots of classes per day, and due to the high number of classes, there are not enough devices (projectors or IT rooms) to cover all of the classes at the same time. According to Keengwe et al. (2008), while teachers generally have access to essential BBL tools, many lack adequate training and support to effectively integrate these technologies

into their teaching practices (Keengwe, 2008). Dinc (2019) highlighted that schools frequently face difficulties in providing sufficient resources, which limits the extent to which BBL can be utilized in classrooms according to the number of classes. The study emphasized the need for ongoing professional development and institutional support to overcome these challenges (Dinc, 2019).

Additionally, teachers struggle with time constraints and heavy workloads, making it challenging to find time for content preparation and professional development. Ruggiero and Mong (2015) identified time constraints and heavy workloads as significant barriers to effective BBL integration. Teachers often find it challenging to allocate sufficient time for content preparation and professional development (Ruggiero & Mong, 2015). These challenges highlight the need for ongoing professional development and institutional support to optimize the integration of BBL in education.

5.3 Conclusion

In conclusion, the integration of BBL tools in classrooms has shown significant potential to enhance student engagement, comprehension, and accommodate diverse learning styles. While teachers have positively embraced these tools, recognizing their benefits in making lessons more interactive and efficient, challenges such as inadequate training, limited resources, and time constraints remain. Addressing these challenges through comprehensive training, better resource allocation, and ongoing support is crucial for optimizing the use of educational technology in enhancing teaching and learning outcomes. The recommendations aim to support teachers in overcoming these hurdles and

fully harnessing the potential of BBL in education.

5.4 Recommendations

Based on the findings and discussion, the following recommendations have been made:

1. Comprehensive Training Programs for Teachers:

Hands-on sessions on brain-based learning methods and integration of tools, including PowerPoint presentations, multimedia, projectors, digital content creation, and online resource utilization, should be provided on a cluster basis. Ongoing professional development should be offered to keep teachers updated with emerging technologies and pedagogical practices.

2. Enhanced Access to Technology to avail the 21st-century skills:

Sufficient resources, such as multimedia projectors, laptops, audio devices, and Wi-Fi connectivity, should be allocated to schools. Equitable distribution, especially in underserved areas, should be ensured to address disparities and promote digital inclusion. Additionally, digital equipment should be allocated according to the size of classrooms in large schools, which will be used to show videos, hear audio, and show presentations and pictures. Proper maintenance should be carried out at regular intervals.

3. Promotion of Collaboration and Positive Mindset:

The formation of teacher communities or professional learning networks should be facilitated to enable the exchange of ideas, best practices, and resources. A positive mindset towards BBL integration should be promoted by addressing fears, misconceptions, and resistance to change through targeted professional development.

4. Optimizing Teacher Workloads for Enhanced Educational Efficiency:

Reduce teacher workloads by ensuring an adequate number of teachers relative to the student

population and minimizing the need for extra classes. The administrative workload should be managed efficiently so that teachers can get enough time for their content preparation.

5.5 Scope for further study:

1. Further studies should properly evaluate the current training needs in BBL to enhance targeted and effective professional development for teachers.
2. Investigating the state of infrastructure quality in schools is crucial for identifying gaps and prioritizing improvements needed to support the effective implementation of BBL tools.

Reference

1. Ahmed, S., Mazari, H., Hassan, M., Azam, S., Sidotam, A.,
Clarke-Wilson, A., & Sarwar, M.
2. A. H. (2023). Lessons on technology-enabled teacher professional
development from
Bangladesh's national curriculum reform. ED Tech Hub.
<http://www.a2i.gov.bd>
3. American Federation of Teachers (AFT). 2000. Resolution on Teacher
Education and Teacher Quality.
4. Alam, A. (2020). Challenges and possibilities of online education during
Covid-19. Preprints, 2020060013.
<https://doi.org/10.20944/preprints202006.0013.v1>
5. Anderson, T., & Dron, J. (2011). Three generations of distance education
pedagogy.
International Review of Research in Open and Distance Learning, 12(3), 80-97.
6. Atabek, O. (2019). Challenges in integrating technology into education.
Information
Technologies and Applied Sciences, 14(1), 1-19.

<https://doi.org/10.7827/TurkishStudies.14810>

7. Atlantis Group. (2019). System failure: Why EdTech policy needs a critical update.

<https://www.varkeyfoundation.org/what-we-do/atlantis-group/system-failure/>

8. Batane, T., & Ngwako, A. (2016). Technology use by pre-service teachers during teaching

practice: Are new teachers embracing technology right away in their first teaching experience? *Australasian Journal of Educational Technology*, 33.

<https://doi.org/10.14742/ajet.2299>

9. BANBEIS, 2023, Bangladesh Education Statistics 2023. Retrieved from www.banbeis.gov.bd

10. Beam, E., Mukherjee, P., & Navarro-Sola, L. (2021). Take-up, use, and effectiveness of

remote learning technologies in Bangladesh during COVID-19.

[https://www.poverty-action.org/recovr-study/take-use-and-effectiveness-remote-le](https://www.poverty-action.org/recovr-study/take-use-and-effectiveness-remote-learning-tech)

[arning-tech](https://www.poverty-action.org/recovr-study/take-use-and-effectiveness-remote-learning-tech)

[nologies-bangladesh-during-covid-19](https://www.poverty-action.org/recovr-study/take-use-and-effectiveness-remote-learning-tech)

11. Bhasin, B. (2012). Integration of information and communication technology in enhancing teaching and learning. Contemporary Educational Technology. Retrieved from <https://dergipark.org.tr/en/pub/cet/issue/25728/271458>
12. Bouchrika, I. (2024). What Is Educational Technology (EdTech) in 2024?. Education.
13. Cohen, D., & Crabtree, B. (2006). Qualitative research guidelines project.
14. Creswell, J. W. (2014). Research design: Qualitative, quantitative and mixed method approaches (4th ed.). Sage.
15. Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry & research design (4th ed.). Sage.
16. Dinç, E. (2019). Prospective teachers' perceptions of barriers to technology integration in education. Information Technologies and Applied Sciences, 10, 381-398. <https://doi.org/10.30935/cet.634187>
17. Downes, S. (2012). Connectivism and connective knowledge: Essays on meaning and

learning networks.

http://www.downes.ca/files/books/Connective_Knowledge-19May2012.pdf

18. Evans, D. (2019). Can technology enable effective teacher coaching at scale? World Bank.

<https://blogs.worldbank.org/impactevaluations/can-technology-enable-effective-teacher-coaching-scale>

19. GPE. (2020). Summative evaluation of GPE's country-level support to education: Bangladesh

(Batch 5, Country 15: Bangladesh). Global Partnership for Education.

https://www.globalpartnership.org/sites/default/files/document/file/2020-01-21-GPE-Bangladesh-CLE_0.pdf

20. Herlo, D. (2017). Connectivism, a new learning theory? European Proceedings of Social and

Behavioural Sciences, 2(1), 330-337.

<https://doi.org/10.15405/epsbs.2017.05.02.41>

21. Hsu, P. S. (2016). Examining current beliefs, practices and barriers about technology

integration: A case study. TechTrends, 60(1), 30-40.

<https://doi.org/10.1007/s11528-015-0014-3>

22. Icard, B. (2014). Educational technology best practices. *Journal of Instructional Technology and Distance Learning*, 11(3).
23. Johnson, B., & Christensen, L. (2004). Educational research: Quantitative, qualitative, and mixed approaches. Boston: Pearson.
24. Keengwe, J., Onchwari, G., & Wachira, P. (2008). Computer technology integration and student learning: Barriers and promise. *Journal of Science Education and Technology*, 17(6), 560-565. <https://doi.org/10.1007/s10956-008-9123-5>
25. Keengwe, J., & Onchwari, G. (2009). Technology and early childhood education: A technology integration professional development model for practicing teachers. *Early Childhood Education Journal*, 37(3), 209-218. <https://doi.org/10.1007/s10643-009-0341-0>

26. Koehler, M., Mishra, P., Akcaoglu, M., & Rosenberg, J. (2013). The technological pedagogical content knowledge framework for teachers and teacher educators. Retrieved from https://www.researchgate.net/publication/267028784_The_Technological_Pedagogical_Content_Knowledge_Framework_for_Teachers_and_Teacher_Educators
27. Major, L., & Francis, G. A. (2020). Technology-supported personalised learning: A rapid evidence review (Rapid Evidence Review No. 1). EdTech Hub. <https://doi.org/10.5281/zenodo.4556925>
28. Merriam, S. B., & Grenier, R. S. (2019). Qualitative research in practice: Examples for discussion and analysis (2nd ed.). Jossey-Bass.
29. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>

30. MoE. (2010). National education policy 2010. Ministry of Education,
Government of the
People's Republic of Bangladesh.

31. Moni, D., Chowdhury, A., & Ahmed, S. (2023, May 15). Six elements
accelerating education
for a Smart Bangladesh and a Smart World. World Economic Forum. Retrieved
from
[https://www.weforum.org/agenda/2023/05/six-elements-accelerating-education-fo](https://www.weforum.org/agenda/2023/05/six-elements-accelerating-education-for-a-smart-bangladesh-and-a-smart-world/)
[r-a-](https://www.weforum.org/agenda/2023/05/six-elements-accelerating-education-for-a-smart-bangladesh-and-a-smart-world/)
[smart-bangladesh-and-a-smart-world/](https://www.weforum.org/agenda/2023/05/six-elements-accelerating-education-for-a-smart-bangladesh-and-a-smart-world/)

32. Palinkas, L., et al. (2013). Purposeful sampling for qualitative data
collection and analysis in
mixed-method implementation research. *Administration and Policy in Mental
Health*,
42, 533-544.

33. Parvin, R. H., & Salam, S. F. (2015). The effectiveness of using
technology in English
language classrooms in government primary schools in Bangladesh. *FIRE: Forum
for*

International Research in Education, 2(1). <https://doi.org/10/gkm64q>

34. Rossman, G., & Rallis, S. (2017). An introduction to qualitative research
(4th ed.). SAGE

Publications, Inc. <https://dx.doi.org/10.4135/9781071802694>

35. Ruggiero, D., & Mong, C. J. (2015). The teacher technology integration
experience: Practice

and reflection in the classroom. Journal of Information Technology Education:
Research, 14, 161-178.

[http://www.jite.org/documents/Vol14/JITEv14ResearchP161-178Ruggiero0958.p
df](http://www.jite.org/documents/Vol14/JITEv14ResearchP161-178Ruggiero0958.pdf)

36. Sharmin, N., & Roy, G. (2011). Computer-aided learning and mentoring
for improvement of
teaching quality: An assessment of BRAC interventions. SSRN Electronic
Journal.

<https://doi.org/10.2139/ssrn.2923676>

37. Shrestha, P. (2013). English language classroom practices: Bangladeshi
primary school

children's perceptions. RELC Journal, 44(2), 147-162.

<https://doi.org/10.1177/0033688213488466>

38. Siemens, G. (2005). Connectivism: A learning theory for the digital age.

International Journal

of Instructional Technology and Distance Learning, 2(1), 1-8.

http://www.itdl.org/Journal/Jan_05/article01.htm

39. Stutter, W. N. (2006). Introduction to educational research. California:

Sage Publications Inc.

40. Sustainable Development Goal 4: Quality education | The United Nations

in Bangladesh.

(n.d.). Sustainable Development Goal 4: Quality education | The United Nations

in

Bangladesh.

<https://bangladesh.un.org/en/sdgs/4#:~:text=Ensure%20inclusive%20and%20equi>

table

e%20quality,lifelong%20learning%20opportunities%20for%20all

41. United Nations. (n.d.). United Nations: Key conference outcomes in

education.

<https://www.un.org/en/development/devagenda/education.shtml#:~:text=In%2019>

90

%2C%20the%20International%20Literacy,

countries%20to%20universalize%20adequate%20basic

42. Willis, J. (2006). Research-Based Strategies to Ignite Student Learning:
Insights
from a Neurologist and Classroom Teacher. Alexandria, Virginia: Association for
Supervision and Curriculum Development
43. Yin, R. K. 2003. Case Study Research: Design and Methods. Thousand
Oaks, Calif.: Sage.