

Interactions in Science classrooms: A Qualitative Exploration of Students' Perception through a Gender Lens.

By

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A thesis proposal submitted to the BRAC Institute of Educational Development in partial fulfillment of the requirements for the degree of

Master of Education in Educational Leadership & School Improvement

BRAC Institute of Educational Development
BRAC University
January, 2021

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Declaration

It is hereby declared that

1. The thesis submitted is my/our 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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Approval

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Ethics Statement

From the very beginning appropriate measures were taken regarding ethical concern. The proposal was made keeping all the ethical issues in mind. One ethics form was filled and submitted after the creation of the thesis proposal. The ethics form was approved by the committee.

Before data collection, the participants were initially called and notified about the research over phone. Since the participants were students of primary school, all of their parents were informed properly with all necessary information. When the purpose, significance and their contribution towards this research was all discussed and they gave permission, only then, a consent letter was sent to them for their consent sign and for their children to take part in the research. It was well instructed to the participants and the parents that at any given point they can withdraw their consent. No judgment was made throughout the data collection and no harm, hate speech or offensive words were used by anyone. The participants were given full freedom to speak and not at all provoked towards anything. The data is also used by the consent of the parents. All the data was kept safe in personal computer and nobody has access to these.

After the research and thesis was done, another ethics form was filled up to make sure there were absolutely no issues regarding ethics which is also approved by the committee.

Abstract

Gender plays an important role in learning process. Participation in a science classroom is often driven by the gender of the students. The goal of this research was to see the classroom participation of a science class of grade 5 from a gender lens which was seen from a student's perspective. The aim was to see how gender plays a role when students participate in a science classroom. A qualitative research was conducted in a Government Primary School with 6 participants among whom there were 3 boys and 3 girls of grade 5. The data was collected through interview and observation and then thematic analysis was done to come to the findings. Some key findings of the study show that female students participate less in a science class, students prefer to talk to the students of same gender and often teacher interacts more with the students of the same gender.

Keywords: Gender; Classroom interaction; Science classroom; Primary school

Acknowledgement

I would like show my sincere gratitude towards my supervisor Shamnaz Arifin Mim for her continuous support throughout my study. She guided me to make this study an effective one being very easy going and amicable.

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Chapter 1

Introduction and Background

1.1 Introduction

Primary schools are the mandatory starting point of a child's educational journey (Nwonwu, 2008). It creates the base structure of a child's thought process and its view towards the society. So, it is very important to see the primary education in a deeper eye. There are a lot of key factor which exist in primary education that helps to create the child's perception, future, believe and so many things. Among all the key factors gender is one of the most significant. We can see the society creating differences between gender and creates norms for different gender perspectives (Blackstone, 2003). Primary schools are no different. In Bangladesh coeducation exists in primary schools. Hence, it is very important to explore the gender role in the primary school. Gender role is a strong criterion to ensure sustainable education also (Education and gender equality, 2020). Seeing participation in a primary school through a gender lens is a obligatory thing which comes with the right of education (Subrahmanian, 2005). Therefore, to explore the gender role in the primary education of Bangladesh it is needed to see the practice in teaching learning.

Throughout this thesis I wanted to see the gender-based participation in a science class. At the primary level, though girls and boys are equally having the same courses it is often seen that they do not end up having the same level of understanding (Hill, Corbett, & St Rose, 2010). Worldwide, in a general eye we see that there are fewer female scientists than male. Women are not that much into vocational and science-based skill training also in their career (UNESCO, 2010). There is something underlying from the very early age. I want to explore how do the boys and girls of primary school participate in a science class. I have also dug deep into the perception of the

students regarding the interactions made by their teachers in the science class. This has sum up an idea of the participation, impression and interactions of boys and girls in a science class.

1.2 Research Topic

Gender based participation in a science class

Research Title: Interactions in a Science classroom: A Qualitative exploration of students' perception through a gender lens.

Rationale and Aspect: I have been working in a government primary school as a fellow of Teach For Bangladesh. I have seen that topics like infrastructure, drop outs, results and such are discussed and talked a lot among the teachers and students. But the practice of gender equality or the importance of gender equality is not often talked in the school. Similarly, it is seen that the participation of the students based on the gender is overlooked so easily and so often. I have taken science class during fellowship and have seen a difference regarding the gender-based participation of the students. From my point of view, gender equality plays a very important role in the whole teaching learning process both in a direct and indirect manner. I have seen that teachers sometimes differentiate the works of boys and girls. I have also experienced that the students often decide what type of cocurricular activities they should participate in according to their gender. Thus, a government primary school is a very stimulating place to observe gender equality. Moreover, I have been working in humanitarian organizations for more than 3 years and one of my key areas of work was women empowerment in different professional sectors. I have completed my honors in Anthropology which talks about gender equality in a holistic manner. So, from my academic and professional experience an interest in gender equality is grown. I want to

explore its practice in a very basic aspect which is a school. A school is the place where a child learns so many things at a very tender age which remains with him/her lifelong. Besides, co-education exists in government primary schools of Bangladesh. Therefore, gender equality will play a key role here. In a society where patriarchy exists in a strong manner, it is very important to see the practice of gender equality in a government primary school.

This topic will be seen in a holistic way. I wanted to explore the perspective of a student regarding the participation in science class to see whether they think girls and boys participate equally in a science class or not. I have explored how the teachers can create space for gender-based participation while participating in a science class. Besides, I sought to see from the students' point of view. Students are the key of my research. I desired to find the behind reason of less female scientists in the world. This study has allowed. me to see whether the boys and girls participate in the science class equally or not. And if they do not, then what is the reason. Which gender gets the privilege of it. I have seen from my experience while working in a government primary school, that often girls get less mark than boys in science. I have also seen that teachers are assuming it as a normal thing. Consequently, this topic will allow me to dig deeper into it.

1.3 Statement of the Problem

From my own experience in teaching, I have seen that not all the students participate equally in a science class. There are different characteristics seen among the students. If you can dig deeper into the scenario then you might see that there is a pattern among the participation of the students and gender can be a key factor on this (Murphy, Eduljee, Parkman, & Croteau, 2018). Gender based equal participation is a part of effective learning also. It creates an effective learning vibe in the classroom (Crombie, Pyke, Silverthorn, Jones & Piccinin, 2003). Subsequently, the whole learning can be affected if the participation does not happen gender neutrally.

Gender balance is a structurally important thing for any society. This influences to build the structure of a society in the long run along with building a proper systematic structure (Shilpi, Hasnayan, Ilahi, Parvin & Sultana, 2017). From my experience of working in a government primary school I have seen that not all the students get equally motivated to a particular class. Often it is also seen that motivation depends on the gender because of some privileges and moral dilemmas (Shilpa,207). It is seen that female admission rate is higher in the primary schools than male but throughout the time female students get drop out. The dropout rate of female students is higher than male students (Huq & Rahman, 2008). So, there is an underneath reason behind this. There might be many reasons behind it. Overall, in the world men are more into science related field than women (Kerkhoven, Anne, Russo, Land-Zandstra, Saxena, and Rodenburg, 2016). We cannot see the balance even in any particular sector of science. The topics related to science most of the time taught be male teachers in high schools and colleges (Kerkhoven et al., 2016). There is one interesting fact about this is girls will get more serious and attracted to science if the examples of the science class would be given in a feminine manner. For an example, a reference of smoking will be a feminine manner and an example of nervous system will be a mail manner (Kerkhoven et el., 2016). So, teachers do not keep that in mind to attract more female students towards science education. The visual portrayals can play a vital role also. In the visual aids that are used in the classroom, women should be in those images or visual aid. These will ensure the gender equality regarding the participation in science class. Boys choose more science related topics and tools to work with from the very earlier age than girls (UNCTAD,2011). This shows us a greater problem in primary schools. Science is a sensitive subject and while teaching it is to be kept in mind that gender role should be moderated properly in a science class (National Science Teaching Association, 2019) So there is inequity in science class. The perception towards science

class might not also be same for male and female students. Male and female are qualitative different towards a particular class and specifically in a science class (Yamtinah, Masykuri, Ashadi, & Shidiq, 2017). Male students are better in showing skills related to science subject (Yamtinah, et al, 2017)

I wanted to see the classroom participation of boys and girls which can be a very defining matter since co-education exists in most of our Government Primary school. So, in the whole teaching learning process maintaining gender equality is a mandatory thing. I want to dig a particular portion of this thing. That is gender-based participation in the science classes. I have seen that female students do not feel much comfortable to make responses in the classroom in science classes even if they are good students and do good in examinations. Some topics like physical limbs or the chapters which contains biological aspects can be a cause of their shyness also (Hall, 2011). So, there is a problem underlying in this gender-based participation in science classes.

1.4 Research Questions

1. What is the pattern of student's interactions among themselves in the classroom?
2. How the students experience the teacher's interactions with male and female students in a science class?

1.5 Purpose of the Study

The purpose of the study is to draw a holistic approach to understand the practice of gender equality in a science class of a government primary school. My goal was to see the thoughts of their mind regarding practicing gender equality in the science classroom. Then comes about their actions. I explored what actions do teachers take inside the classroom to practice gender equality. I saw this from a student's perspective. The students also play an important role here. I tried to know their

role also about how they practice gender equality and their participation in their class works, group works and etcetera in their science class. The purpose of this study is to see from a greater eye how do the students see gender equality in a science class. First, I have seen how the students interact in their classroom with each other. Then I have explored what they do in their science class. I wanted to know their thinking regarding gender equality in their classroom. I sought to know from their perspective whether they are equally participating in the science class or not. They were able to tell me how the teachers are creating a safe and equal space for the students regardless of their gender. Besides, I have known the thought process of the students regarding equal participation in the science class. I have been able to know the reason why females participate less in the science classroom than boys. My purpose of getting into the core of the reasons has been served through the study. I have come to know what the boys think regarding less participation of the girls if there is any along with their perception regarding this. The female students have also told me what do they think of this reason and happening. They have let me know about their thoughts or any obstacles they face.

I dug deep to know the perception of the students regarding gender practice in science classroom. This study has allowed me to have a clear vision regarding what steps are consciously taken by the teachers to maintain the gender balance and what are being overlooked. This has given me an overall scenario of gender practice in that particular school which has also helped me to understand or have an in brief insight of the government primary schools of Dhaka city. Overall, I have obtained a holistic insight of gender practice in a government primary school's science class.

1.6 Significance of the Study

In this study I have been able to see the gender practice from within a government primary school. This study even produced some new knowledge about the insight of the students about gender

equality. This study is a significant one because I have been able to spend so many times in the field since I have a previous work experience here. This study has let me do the crosschecks of students' thoughts and actions which has given me a new insight about their actions and thinking regarding gender practice in a science classroom.

This study firstly would help to have a clear insight regarding gender practice in the science classroom. They would also have an insight regarding the less female participation in science related field. The teachers will be able to know how they can practice gender-based interactions or how are they avoiding it consciously or subconsciously. So many students will also have an understanding of gender equality and how other people perceive it. The central policy makers even will be able to learn about gender practice in a science class. which is not directly mentioned in the text books and cannot be known from here and there. The policy makers will be inspired to even establish any policy and steps or innovations to enable the practice of gender equality in primary schools. This study will show how small steps or novelties can pave the way of gender equality. Educators will have a glance regarding necessary steps that are taken or can be taken to ensure gender equality and equal interaction in a science classroom.

Throughout the world it is seen that female scientists or female who are working in science innovations are so less than male (Kerkhoven et al., 2016). This does not happen all of a sudden. Of course, there is an underlying reason behind it. Primary school is the place where a child first learns to socialize. They learn in which subject they are interested to. They can know themselves. They can decide which subject gives them ease. There can be no easy decision to it. There might be something from a very tender age which is bothering the female students to grow interest in science. This study will be able to dig deeper into it. The whole country will be able know the underlying reason behind it which lays in a primary school science class. The scientist will be able

to know the reasons also and they will be able to work on this. This reason can be useful to the education ministry also and for the policy makers. They will be able to re shuffle the system to attract more female students in the science class. Moreover, this study can bring a longer effect to the whole system. Taking this study into action they can be able to take steps to heal the scenario which can bring female students more towards science that can lead into having more female scientists also. In the longer run this study has it's so many direct and indirect significance.

Gender equality is a less talked thing in a government primary school and that's why I have seen some girls feeling left out and losing interest for the science class. I have even seen achievement gaps in science classrooms for which I think lack of gender practice plays a crucial role. Besides, the teachers or students even might not know the significance of gender equality in teaching learning. It might seem a new thing to them. They might not even know what it actually means. This study has helped me to get that also. Then I have been able to know what to do to make gender practice viable in that government primary school. I know about the initiatives that can be taken to implement different activities which will allow the teachers and students to practice gender equality in science class. This study will help many people to get an elaborate status of different thoughts of different children studying in different classes along with their interrelation with the teachers. All of these together will make an impact in the whole educational setting.

Chapter 2

Literature Review

In this section I present some literature review that has made me understand my study more. I have reviewed some articles, books and documents related to

2.1 Conceptualization of gender and gender equality

There was a time when gender and sex were portrayed in a same manner and people did not get the different concept behind these two terms (Coulthard & Castletan, 2006). When world has seen the wave of feminism then social scientists and feminists started to separate these two concepts. It first occurred in different debates arose in different parts of western societies (Coulthard & Castletan, 2006). Sex and gender are two different concepts which are conceptualized in a different manner. Sex is the biological or physical structure and traits of a human whereas gender refers to the social and cultural characteristics of a human (Giddens, Duneier, Appelbaum & Carr, 1991). So, sex only refers to the physical differences and gender refers to the sociocultural difference between and a male and a female. Gender represents typically a broader aspect where society defined role plays a vital role also (Torgrimson & Minson, 2005). So gender can be different from society to society depending on the expectation or 'norms' of that particular society. Persons of same sex can be different in gender roles reliant on the society he/she belongs to (Torgrimson & Minson, 2005).

Gender equality is the process of allocating resources, facilities or organizing events, programs or anything and everything keeping both males and females equally keeping in mind without making any discrimination based on anyone's sexual orientation (Pathania, 2017). Gender equality ensures the equal rights for both male and female and certifies the way of holistic development (Hirsu,

Hashemi & Quezada-Reyes,2019). Gender equality also addresses any situation where any particular gender is lagging behind of being victimized (Pathania, 2017). Gender equality can assure the equal right, participation or privilege of male and female in a society.

2.2 Gender based classroom participation

Gender based balance is a worthy enough thing to ensure a proper structural system in a country (Shilpi, Hasnayan, Ilahi, Parvin & Sultana, 2017). There is a found difference between the male and female anticipations in several educational institutions in Bangladesh (Shilpi et al.,2017) Regarding gender practice there is another dimension there. The quality of teaching learning practices in the classrooms does not portray a scenario where all the students regardless of their gender will get equally motivated and prioritized (Shilpa,207). Regarding gender practice it is also an important thing to have an insight about the gender of the teacher and how the relationship of the students with teachers may varies due to the gender of a teacher. Sometimes it might be seen that the women teachers pay more attention to the female students or totally a different picture can also be seen (Skelton, Carrington, Francis, Hutchings, Read, & Hall, 2009). Gender might play a role regarding learning or development in any specific subject. In a particular society people can assume that male students are good in math and in another society the perception might be different also.

Boys participate more in classroom activities than girls which also make the boys being more active in the classroom and being more motivated towards study (Martinović, Ilić, & Višnjić, 2011). Gender disparity is a common ground in Bangladesh perspective.

2.3 Gender based classroom interactions in a science class

Girls are seen as marginalized because of their less participation and interactions in science classes. They also do not think of a career from an early age based on science. STEM education is seen so less among girls (National Science Teaching Association, 2019). Curriculum materials of science subject often direct towards a male biased situation also and thus, all students do not get equally motivated to participate and interact in the science class (National Science Teaching Association, 2019). Male students are seen to do better in science classes and being more eager than female students. Male students tend to do better in practical attributes, making decisions related to science subject and different questions and often female students tend to have good understanding but those practical skills are being shown less in them (Yamtinah et al., 2017). So, this can be understood that from the very early age participation and interaction in science class of the girls play a vital role throughout the whole life. It is also visible that there is something underlying there regarding gender-based interaction in a science class.

2.4 Gender based overall performance in Science sector

It is visible that female scientists are less than male. Females usually do not get involved in the science related career. The number of females pursuing a science-based career is so less than male (Kerkhoven, Anne, Russo, Land-Zandstra, Saxena, and Rodenburg, 2016). From school to top level, we see female students get less involved in science class and the amount of female continues to become lower gradually according to the level of education (Sjoberg & Imsen, 1988). Male and female have some biological and emotional differences also. Often times, this can be a cause of that also. Besides, in science classes, there are some chapters which talks about biological structures of human which can somehow make female students become less active in the class (Sjoberg & Imsen, 1988). Many types of barriers of effects might be there which cause so less

participation of female choosing science-based career than male. This might be in a ratio of 3:1 (Kerkhoven et al., 2016). In order to ensure the female participation in science-based role it is important to make the participation of female students assured from a very early age (UNCTAD, 2003). Girl's achievement and participation in science is depended on the environment they belong (Hill, Corbett, & St Rose, 2010). So, it is so important to create the environment in a science class where girls can participate in an open and easy manner. Because men outnumbered women regarding participation in the science related activity and pursue a career in science, often teachers might subconsciously assume that in a science class male student will be more proactive (Hill, Corbett, & St Rose, 2010). It is needed to change the culture of a science class room to make it more gender sensitive and make the participation of female students more viable (Hall, 2011). Even students might hear the stereotypical assumptions that male students do well in science and that will make the female students even more lag behind. From a very early age female students face a lot of barriers in their life. So, if the science class seem boring to them then they will not find any attraction towards it. So, the way of teaching learning might be a cause of the female students doing less participation in a science class (Hall, 2011). Overall, this is so necessary to know from the students' perspective about their experience in science class. Both male and female students and their thought will play an important role here. Science class can be a very good place to explore gender equality and explore a new dimension of gender-based interaction.

2.5 Global context of participation in a science classroom

Globally there are many factors working behind for classroom participation. There are many steps that can be taken to ensure equal class participation regardless of the gender of the students. If students can relate to what is being taught and proper initiatives can be taken like giving relevant example from real life, then all the students get more motivated to participate in a science

classroom (Chen & Looi, 2011). Gender based participation disparity is seen in different countries all over the world. This is not restricted to Bangladesh only. For example, historically it is seen in all over the world that the science text book is biased towards male students. The images, content and the structure of the science books are not fair for the female students which affect in their participation in the classroom (Guzzetti & Williams, 1996).

Chapter 3

Methodology

3.1 Research Site

My research site was a Government Primary School in Dhaka city. I have worked in a Government Primary School in my professional life and I have decided that a Government Primary School would be the best possible site to see the gender-based classroom interaction from a gender lens since this is the most common medium of education in our country.

3.2 Research Participants

Participants of this research are 6 students from grade 5. 3 females and 3 male students. I wanted to explore from students' perspective so all of my participants were students.

3.3 Sampling Procedure

My targeted population was the students of grade 5 of a Government Primary School. I have used convenience sampling method to select the participants. Convenience sampling is a method where participants can be selected based on their availability and effectivity (Taherdoost, 2016). This is an easier sampling method to reach out to my target participants. My target was to select 6 participants from grade 5 who would be available to make a conversation. Then I randomly selected 3 male and 3 female students upon their interest and availability and took interview of them.

3.4 Data Collection Process

Since it is a time of pandemic and the schools are closed, I have taken the interviews over phone. I have collected the phone numbers of 3 male and 3 female students of grade 5 and interviewed

them in their convenient time. I have also observed 2 science classes of different teachers. One class was taken by a male and another class was taken by a female teacher.

3.5 Field Plan

I had start collecting data in the first week of February, 2021. Beforehand, I let the participants aware of my data collection and took a comfortable time of theirs. First, I had observed 2 science classes then according to the convenient time of the participants I had taken the interviews of them.

3.6 Research Approach

The approach of the research is qualitative. Qualitative research is based on the data collected directly by the researcher from the field and the result is depended purely on the collected data which draws some narrative statement or description (Patton, 2005). This is a qualitative research since I have collected data directly from the online classrooms and interview of the students. I wanted to know about the thought process and expression along with the intention of the male and female students. I observed classroom and saw how the students reacted and participated in the classroom. In this way I wanted to draw a narrative interpretation of the problem.

3.7 Data Collection Method

The method involves emerging questions and procedures. I have collected data from the participant's comfortable setting. I have conducted Interview and Observation for this study. I have observed 2 science classes of grade 5 of two different teachers. One is male and another teacher is female. This has given me a clear idea about the pattern of the science class and how the male and female students interact and participate in a science class. Because I wanted to see the students'

perspective. I have observed two online science classrooms. The students and the teachers were on video so I could see how they interacted and participated in the class.

I had selected 6 students for interview. All of them are from grade 5 and 3 of them are male and 3 of them are female. I prepared semi structured questionnaire for the students so that I can guide but the participants can respond in their own way. This helped to find their perspective. By interviewing I was able to know their impression, idea and thought process about a science class. Beside I was able to know about their interaction with each other and with the teachers. By an interview I was able to dig deep after building a strong rapport with the students. In this way enough and effective data comes up. In this pandemic scenario I reached all of them over phone and talked to them in their convenient timing.

3.8 Role as a Researcher

My key role as a researcher was to ensure the ethical concern. I was not biased towards the process of data collection. I made sure that no participants were provoked by any of my attitude. As a researcher I have taken care of the availability of the participants. I did not force them to give time to me. I ensured that no participants had faced any issue regarding safe and security. I have made sure that no participants felt pressure or provocation during data collection. To justify my role as a researcher I have kept myself above any judgment and presumption. I collected data as an outside researcher without making any provocation or ethical issues.

3.9 Data Analysis Process

I have done a thematic analysis of the data. I have read for several times to know the data. Then I have organized the data in chunk and given them meaning by coding. I have tried to relate the data

to the literature review. Through the analysis, I have drawn images, create concept maps or use metaphors as per need. Different themes have been used to categorize the data.

Notes and transcription of the data was with me. Then I divided them into codes. I tried to find meaning from the codes by dividing them into themes. I have tried to go through all the data for several times. That gives me comfortability on the gathered data. Then categorically after dividing them into themes I have reached to my result.

3.10 Trustworthiness and Rigor

Trustworthiness is a mandatory element in a qualitative study. It has to be maintained in every part of the data collection. Trustworthiness includes rigor, confidence and truth of the collected data which can be maintained from data collection to data analysis (Elo, Kääriäinen, Kanste, Pölkki, Utriainen & Kyngäs, 2014). To ensure the trustworthiness of the data I had to ensure whether the data is credible and dependable. That means to show the credibility I have made sure that the data I am collecting are true and beyond any biases. I have consulted with my supervisor for every step I take. My supervisor has guided me to go through a certain procedure to collect trustworthy data. I have completed related courses regarding data collection methods. I have studied and watched videos on how to conduct effective interviews without any biases. I have consulted with my supervisor and other experienced researchers about building strong rapport to get stronger and trustworthy data.

Table 1

Research Site	A Government Primary School in Dhaka city
Participants	3 Male and 3 Female Students of grade 5
Approach	Qualitative
Data Collection Tool	Interview, Observation
Sampling	Convenience Sampling
Number of Interview	6 interviews. 3 with female students and 3 with male students
Number of Observation	I have observed 2 science classes online

3.11 Limitations of the Study

Barriers and Challenges: There were some limitations in the study. Such as:

- The school has been closed since March 2020 till now. According to the news published on The Daily Star on March 16, 2020 that the school will be closed from March 17, 2020. Thill then, it is closed still now. According to a news of Dhaka Tribune published on June 12, 2021 the schools will be closed till June 30, 2021. Collecting data in the pandemic when the schools are closed is very challenging. It is always good to collect data face to face. The rapport building becomes easier also.
- Collecting data from the students via interview was a limitation also. They found it hard to understand the purpose of the study. Ensuring the consent from the parents was also a challenge.

- Observing an online class is a limitation also. Couldn't see the expressions and interactions properly

Addressing the Challenges: I have taken some steps to overcome the barriers and challenges.

- Collecting data via mobile phone or other online platform was a solution to the first challenge. I had taken a preferable time of the participants and conducted the data collection in their preferable platform.
- I have built a rapport over phone with the participants so that they feel comfortable and free to share. I have tried to use the online tool the best way possible to collect the data
- I have explained the purpose of the interview properly and easily to the students with the help of their parents.
- I tried to observe as much as possible without making the participants provoked or disturbed. I have tried to observe the tone, participation and facial expressions also as much as possible.

Chapter 4

Results

This study has brought me under an outstanding lens which was not often used by me to see people and different activities. The result of this study is not so linear since I observed a vast and holistic scenario. First of all, observed a science classroom. A gender lens was added into it. Besides, I explored deeply about the students' interactions and reactions. I explored about the students' perspective. Often, we skip what the students think and what is the perception of them. So, it is a mandatory thing to observe and know their perspective. But the whole education system is standing up keeping the students in the center. Without them and their perception the whole education cannot perform well. So, I wanted to gain their perceptions and interests. I wanted to know and understand the interactions and participations in a science classroom via a gender lens. I wanted to explore the answers of my two research questions.

I have gathered data from a Government Primary School via Interview and Observation. Then I did a thematic analysis to reach to the findings of the study. I took note of the interview and also made transcription. It helped me to analyze the data. I had gone through my note and the transcription several times to have a good idea on the collected data. Then I divided into themes and made the analysis. I have taken help of my observation notes also to reach to the findings. I have observed two science classes taken by two different teachers. That helped me to understand the context of the science class. I analyzed the observation notes and that paved the way to reach to my findings. In many cases I have seen that my observation is reflecting on the interview of the students also.

I have divided my findings in two themes. I have reached to some findings and put them under those two themes.

1. Pattern of students' interactions among themselves
2. Teacher's interaction with male and female students

Here I am putting all my findings under these two themes.

4.1 Pattern of students' interactions among themselves

4.1.1 Students prefer to communicate with the same gender students in science class:

From the collected data of 6 students, I have seen that 4 of them (3 boys and 1 girl) has said that they prefer talking to the same gender student. The student named Topon (Pseudonym) has said – “When teachers teach something and I am not clear about that or I need to ask anything to make it clear, I always try to ask a boy. I don't know the reason but I feel more comfortable doing that. If teacher gives a group work, I love to collaborate with my male group mates.”

(Personal communication: Interview# 2, Date: 3rd March, 2021)

This means that when a student wants to participate in anything he or she prefers to participate along with his/her same gender mate. Even when a student does not understand the lesson, he/she does not feel comfortable to seek help from opposite gender student. This kind of speech has come repetitively. So, one result is that boys prefer talking to boys and girls prefer talking to girls in a science class. This finding clearly gives one of my answers of the research questions. I wanted to know the pattern of the student interaction and this finding shows me a pattern. This finding will be helpful for the purpose of the study also. I wanted to explore the gender-based participation

and interaction. This finding shows a particular pattern. I can clearly see a unique pattern in this interaction of the students in a science class.

4.1.2 Students prefer to work with their same gender students:

It was very easy for me to come to a decision regarding this theme. All the participants have expressed same kind of feeling. All of them shared many experiences from their group work or different class activities. In any particular activity, all the participants prefer to have group members of their own gender. Rabeya (Pseudonym) said,

“Whenever a group work comes, I want to be in a group where most of the members are girls.”

(Personal Communication: Interview 6, Date: 4th March, 2021)

This means that when a girl needs to work with other students in a group or collaborative work, she feels comfortable working with another girl and same thing happens to the boys too. A shyness, unease or lack of comfortability is there in working with the students of opposite gender. Girls are not so different in this case. Actually, their approach is pretty much similar to the boys. Boys shared almost the same experience regarding their interactions in a science class. According to them whenever they do not understand anything, they ask any boy not girl. They think that boys will be able to give the answers more perfectly and they feel easy to talk to the boys also. While answering to the questions they have shared that they also like to have boy peers in any given group work or pair work. They love to sit around a boy specially in a science class because it seems comforting to them and they think that their thinking will be the same. Jahir (pseudonym) said,

“I think I will be able to express myself more easily with a boy. The understanding of a particular science thing will be similar for me and another boy.”

(Personal Communication: Interview 1, Date: 2nd March, 2021)

This quote portrays that anything regarding science subject will be more easy for a boy to discuss with a boy.

4.2 Teacher's interaction with male and female students

4.2.1 Boys Participate more in a Science class than girls:

From my observation I have seen that in all the science class boys tend to participate and interact more with the teachers. I have observed two science class and same things happened in both the classes. In a 30 Minute class I have seen that after the initial lecture of the teacher for 15 minutes most of the time of the rest of the 15 minutes boys asked questions more. One of the classes were regarding biology and in that class female students hardly talked. Male students raised question and I have seen that they felt shy a bit to ask questions and to participate.

This scenario addresses my research question to find out the interaction pattern in a science classroom. Male students participate more. So, the purpose of viewing the participation from a gender lens got fulfilled. I have seen that in a class approximately 80% of the time male students gave response and asked questions regarding anything.

4.2.2 Female teachers interact more with female students and male teachers interact more with male students:

I wanted to know from students' perspective about the interactions between students and teachers from a gender perspective. I have come to a finding that 5 out of 6 participants thought that they are asked questions based on the gender of the teacher. Shila (Pseudonym) said that she has observed that female teacher asks more questions to her than any male teacher in a science class. Same kind of speech has come from another four participants.

Two teachers have taken the science class of grade 5 and one of them is male and one of them is female. So, it was easy for the students to distinguish the difference between the pattern of the two teachers. They could easily say by pattern of asking question that which teacher ask more questions to whom. Male and female both the student groups have shared almost the same experience.

4.2.3 Teachers ask more question to the students of their same gender:

There is 1 participant who did not understand any difference between the time when a teacher interacts with a male and interacts with a female. In grade 5 there are two science teachers. Most of the time the female teacher takes the class and the other time a male teacher comes. All the 3 male participants have come up with their repose being the same. That is the male teacher asks them more questions than female students. They have said that commonly that the male teacher punishes them more than the female students also and interacts with them more than the female students. The boys have said that they love when the female teacher comes to take the class.

2 out of 3 female respondents have said that the female teacher asks them more questions than the male students. The female teacher loves to interact with them also. One of the respondents has said, “Madam comes to our side of the class more often and asks more questions to us than the boys. She hardly asks anything to the boys.”

(Personal communication: Interview# 5, Date: 4th March, 2021)

With this quote it is clear that female teachers go to female students more often and ask them questions more than the male students. Female students might also feel comfortable while interacting to the female students. Both male and female students have come out with a common scenario under this theme. They have almost unanimously agreed that the teachers love to interact with the same gendered students as them. So, this theme has helped me to come to my next finding

and that is female teachers interact more with female students and male teachers interact more with male students. Both male and female respondents have shared same thoughts on that. So thus, I have reached out to another finding.

4.2.4 Students have assumed this for granted that boys perform better in science subject than girls:

From my observation and interview as I have already mentioned most of the cases girls participate and interact less in a classroom. They interact less with the peers they also interact less with the teachers. From both of my observation I have seen that female students tend to be quiet in the science class. They remain quieter than any other class of their school. I have asked about it what do they feel about the reason if this happens in a regular basis. All the boys have shared the same experience. They have said that they do not find any reason behind it. All the boys more or less shared that girls tend to be quiet by born. They usually talk less than the boys in most of the cases. Hence it does not seem a matter to think or be tensed.

I have got slightly different scenario from the girls' perspective. Two of them said that they think they understand less in science class than boys. According to Joyita (Pseudonym),

“I think I understand less in a Math and Science class. I have come to know that boys do better in those subjects from elderly people.”

(Personal Communication. Interview 4. Date: 4th March, 2021)

A presumed notion is there that male students do better in science related subjects. This notion has been a conventional thing for the students. Another female participant has said almost the same thing that she has heard that male do much better in these subjects than female students. That's

why she kind of feels a fear to ask or tell anything. She thinks that she might do a mistake whenever she will want to ask any question or concern.

Another female participant did not tell anything particular. She did not tell any specific reason behind less participation of girls in a science class. She has not thought of this that way. According to her This happens randomly. There is no particular reason behind this scenario. Every now and then this happens and this is natural.

4.2.5 Students do not have the idea of the necessity of equal interaction in a science class:

Many of the participants did not have the idea about equal participation or engagement in a science class. I have seen from my observation that male students participate more in a science class compared to female students. When I have asked the students about the necessity of it most of them did not find any answer. To be precise 5 out of 6 of them did not come to any solid answer even after probing for a long time. One of them has given an answer with no confidence that this will make the education more fruitful. The other answers were not so conclusive and did not drive towards any particular finding or result.

4.3 Major Findings in brief

Below I have listed some major findings of my study.

- Students prefer to communicate with the same gender students in science class
- Students prefer to work with their same gender students
- Boys Participate more in a Science class than girls
- Female teachers interact more with female students and male teachers interact more with male students
- Teachers ask more question to the students of their same gender
- Students have assumed this for granted that boys perform better in science subject than girls
- Students do not have the idea of the necessity of equal interaction in a science class

Chapter 5

Discussion and Conclusion

5.1 Discussion

I have mentioned the finding from my data and the themes above. I tried to track result and finding from the theme of the data. There are some more things that cannot be conclusive as a result. I want to make a discussion of that. My findings have portrayed big part of my literature review. From the literatures I had come to know that there is a structural difference between the participation of male and female student in a science classroom. I have found in my observation that male students tend to participate more in the science classrooms. From my literatures I have studied I found that teacher's role is very much vital in many places regarding gender-based participation and in my finding I have also seen that students see that female teachers interact with female students more. Throughout my study I have also found that there is a difference of expectations for male and female students which I found in one of the literatures I reviewed. Overall, the literature reviews have strengthened my knowledge regarding this matter which took me to my findings and they are very relatable and relevant to one another. It is so interesting to interact with the children. They often open up and when they do it gets stimulating to collect information and data. Different kinds of perspective have also come up in my study also. I want put some of those interesting discussion here.

Boys do not mostly even think about the participation of girls in a science class: There is a preset in among the system that it is normal for the girls to participate less in a science class and boys take it as a random thing also (Akuaku,2015). From my interview and observation, I have seen that boys interact more than girls in the science class. When I have asked this to boys to know

their thinking regarding the reason behind it. Unanimously they were same in their reply. They are not bothered about it and they think that it is natural and girls tend to participate and talk less by birth. Thus, this thinking is rooted in their mind from a very tender age.

Influence of surroundings and society: While talking to the participants I have come across a finding that participants have some beliefs and thoughts in their mind which they have got from their elderly people or society. From a very tender age we can see that there is an uneven distribution of household chores between a son and a daughter (Ndirika & Agommuoh, 2017). Participants think that for example girls by born talk or participate less in any scenario. Here I have seen that they have heard this kind of words or notion from the people they blend with. This might be the family, school, teachers, friends and other elderly people. The school itself has so many customs and systematic practice that lead female students to participate less in some particular spaces (Akuaku, 2015). They are growing up having some inherited ideologies in their mind which cannot necessarily be true

Influence of patriarchal hegemony: This idea that they have come to inherit a lot of pre dominant ideas has drawn some attention towards patriarchy. From so long ago we have seen a patriarchal world. Though women are progressing fast now still we have seen that from long ago women are lagging behind in the area of science and technology (Bailey, Greenall, Baek, Morris, Nelson, Quirante & Williams, 2020) Whatever their assumption and ideas are they are all somehow male biased. Even the students do not even know what patriarchy is and still the ideas or ideology they are owning is supporting the patriarchy clearly. For example, participants think that boys do good in science and math and this is natural. This is a notion coming out of patriarchal society and surroundings. In real life they have not encountered any situation like that for sure still they believe this. Even girls believe that. Therefore, there is a clear hegemony of this patriarchal society among

the girls. Without even trying or passing enough life time to come up with a decision like girls do not perform well in science and math all the female participants believe that. Patriarchal provocation is there clearly.

These are some of the points I wanted to discuss which is out of the final findings. I want to add one more thing that, one of the findings of my study made me astonished. I have found from my study that participants unanimously expressed that male teachers get more connected with male students and female teachers get more connected with female students. I did not expect this kind of a finding. In my teaching career this did not come to my mind. But the participants have got both male and female teachers in their classroom. So, they have observed both the teachers and come up with such a result. Thus, this result has made me think more rigorously.

Different expectations for male and female students: Throughout different countries of the world, it is seen that science textbooks are more relevant to male students and thus they find more connectivity with it. The teachers set different expectations for female and male students (Guzzetti & Williams,1996). Hence from the very beginning it is often see that the expectation of teacher and parents become low regarding science subject for females. This also demotivates the female students and resulting in less participation of them in the class.

5.2 Importance of the Result

I have finalized 7 consolidated results from my study as mentioned. These results will clearly clarify the condition of a science classroom in a government primary school. A hypothesis I have mentioned in my study that girls participate less in a science classroom got to be true. The data has showed the same result. Besides, this result will allow school authority and policy makers to think about the curriculum and teaching learning method. This traditional teaching learning method might not make the girls enough encouraged to interact more in the classroom.

My results will make both the male and female teachers more cautious about connecting and interacting equally with all the students regardless of their gender. A teacher has to play an aware and vital role in the classroom. Specially in a classroom where girls often think that they cannot excel like the boys in a particular subject.

The result will help communities not to set different expectations for male and female students. This study will create a way of bringing equal perceptions towards male and female students. This can also show the effect of patriarchal hegemony among teaching learning of science subject.

My result will make the teachers do more interactive learning regardless of the gender of the students. Students have the tendency to cope up more with the same gendered students. This will not make any healthy condition for learning. Students need to break the ice of blending with opposite gendered students. They are all human. This message should spread among their head. This is also important to be a good human being from the very tender age. This result will make the policy makers think that school is a place where humans are built. From the very tender age if a student judge on basis of gender whom to make a group with, this is a problem. This comes from some conservative structures may be. Sitting arrangements can be changed and can be thought of in a deeper way after having this finding. Teachers will be more aware while making groups also. This will enrich the learning environment. This cannot be an ideal learning environment where boys only prefer boys and girls only prefer girls to work with. They need to be blended with each other. This will enhance the learning quality also. Thus, my result and findings of the study might help the whole educational structure and thus the finding has an enormous importance.

5.3 Conclusion

This whole research project was a source of learning and aspiration for me. First of all, I selected the topic from my own interest. I was a teacher and currently working of educational development. From an early age I had an intention to see the society from a gender perspective. Since I have worked in a Government Primary School, I thought this kind of a school would be a perfect option to conduct a study from a gender lens. I then thought and selected the topic thinking that that should be a perfect opportunity for me to explore my interest.

When my work got started, I saw that schools remained closed due to the pandemic scenario. But it did not stop me from doing the research. I have done all the things which I thought I would do. I have conducted interviews, have done class observation and gathered as effective data as possible. I collected the data online. At first this was a bit challenging but in the end it was so fruitful and interesting. This study helped to do a micro level analysis. Even a particular science classroom can have so many dimensions and aspects to see. I did not have that much idea beforehand. How the students at a tender age see things sometimes so differently and sometimes with pre-determined biases. These are so fruitful to explore. Throughout this study I have tried to look beyond what it is seen from outside. I tried to blend with the participants as more as possible. I wanted to see things from their eyes. I wanted to create an environment where every child can share their own experience and thought. It was not easy at all to gather data from the children. It was not easy at all to make them understand the purpose of the study also. But after all, it was possible in a well effective manner.

I have successfully served my own purpose through the study. It seemed hard during the time of lockdown and the school closure. All I needed is to take some further more steps. I wanted to see the student's perception regarding interaction in a science classroom of a government primary

school. For that I needed to talk to the students both male and female and also needed to observe classes. Both were done. I needed to probe the students to find out the answers I was looking for. It was not so easy to make the students understand but in the end it all went well. I have tried to find out the pattern of the interaction from a gender lens and the result which I have mentioned earlier has supported my goal and helped me to serve reach there. I analyzed the data in a manner that can help me to reach to any result without any kind of biases. That has happened in this study. Personally, I have learned that anything is possible at any given scenario. One just needs to dig deeper and make some innovations to reach the goal. I have learned that children and students are great sources of data and information. They need to be taken care of at any scenario. We often ignore the perception of children. That should not be happened. They have their own thoughts and perceptions which can help to come to a great finding. I have also learned while conducting the study that any result might come whether one is ready or not. One just needs to give away all the biases and pre assumptions regarding the result. In that way proper findings will be available for the researcher.

5.4 Recommendations

Based on my study I want to keep some recommendations for different stakeholders. From my own experience of this study these will be helpful for further study and impact.

- **More Government Primary Schools should be included in different study:** I have found some interesting and impactful finding throughout my study on a Government Primary School. I have also seen that there is hardly any research or study has been conducted on Government Primary Schools. Most of our children go to these schools. So this should be brought out to light of research more often.
- **Policy makers should emphasize on a more equitable teaching learning environment for girls:** It is seen in my study that girls are often lagging behind regarding interaction and participation in a science classroom. Therefore, girls should be more encouraged regarding this by the teaching learning environment.
- **Teachers should be aware of creating an equitable space in the classroom:** It is seen from my study that teachers often hold many biases and make connection with selective students and gender plays an important role there. Teachers should be aware of this and need to make a safe environment where every student will be willing to participate and interact.
- **The curriculum of the Science subject can be brought under some research:** Since I have found a gender-based difference in science classroom and girls are often less interested to participate in a science classroom, the curriculum and text books of science subject can be analyzed to whether there is any male biased element or anything that demotivates the girls to excel in this subject.

- **Policy makers should work on creating gender awareness:** From the very root level there are some assumptions that girls cannot do some particular things. This should be eradicated from a very tender age. Otherwise, the whole education system cannot progress in a holistic way. Doing good in any subject is no way related to any particular gender. This message should be spread through the policy makers and teachers to different communities.
- **Gender based difference should be eradicated from the classroom:** I have seen in my study that male and female students often feel uncomfortable to work in a collaborative way. This is a mandatory thing to excel in any particular subject. Group works and many other collaborative works should be done regardless of the gender. From a tender age student should be able to work together without even thinking of any particular person's gender. Interactive learning will be shaped more in this way.

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Appendix A. Consent Letter

Letter of Consent

Dear Sir/Ma'am,

This is Md. Adib Rahman, student of M.Ed. program of BRAC University reaching out to you for conducting a Focus Group Discussion with you son/daughter to complete my thesis for my Masters' program in BRAC University

I am inviting your son/daughter to participate in a short Interview with me to help me out to have some clear insight regarding the topic of my Masters' thesis. This will not take more than 40 minutes of your child's time and will be conducted according to his/her preferred time. You or your child are not at all at risk for taking part in this interview. Moreover, teachers and higher authority may directly or indirectly have benefit from the study regarding the gender practice of your primary school. The Interview might be recorded based on your consent just to keep the data safe so that it can help me to further analysis.

I am assuring you to provide all necessary information about the study beforehand. I will ensure the safety of the participant. There is no chance of any offence or misconduct to your child.

The information your child will provide will be kept strictly confidential. We would be happy to answer any of the study related questions that you might have. Your child's participation in the research is completely voluntary and you have the sole authority to decide for and against your involvement in this study.

If you agree with my proposal to let your child to take part in my research, please state your agreement by placing your signature in the space below.

Signature of Researcher
Date:

Signature of Parent
Date:

Appendix B. Interview Guide

- Impression and perception of the students regarding students' participation in the class
- Their impression regarding science subject
- Teacher's role to ensure gender equality in the science class
- Preference of interaction in a science class
- Experience of interactions of male and female students in science class
- What to do ensure equal participation in science class
- If any gender participates less in science class, what is the reason behind it
- Necessity of equal interaction in a science class