

A Qualitative Study on the Challenges Faced by Bangladeshi STEM Graduates in

Speaking in English

By

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A thesis submitted to the Department of English and Humanities in partial fulfilment of the
requirements for the degree of
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Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing a 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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Student's full name and Signature

Approval

Thesis titled “A Qualitative Study on the Challenges Faced by Bangladeshi STEM Graduates in Speaking in English” submitted by Rubyat Tahrim Rafa (ID: 22263014) has been accepted as satisfactory in partial fulfilment of the requirement for the degree of Masters of Arts in English on 17 September, 2024.

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Ethics Statement

The researcher was careful about making any unethical steps while doing the research. No part of research was plagiarized and any ethical factors which are taken into account for this study are discussed in the methodology part.

Abstract

English is considered as a global language all over the world. In Bangladesh, generally people face challenges speaking in English due to the fact that the Grammar Translation Method (GTM) is heavily used across the country in teaching English. Since GTM does not emphasize skills like speaking and listening, students rarely get the chance to practice those skills. STEM graduates also experience difficulties in speaking in English. So, this study aims at exploring various difficulties Bangla medium background STEM graduates face while learning to speak in English and using English in oral communication, the reasons behind it and the ways students can overcome the challenges. Data for this study came from semi-structured interviews. The results of this study reveal that most of the STEM graduates have moderate to limited English-speaking skill which was not enough for getting high paid jobs or to study abroad. There are various reasons behind this limited speaking skill as the participants face different types of challenges and lack practice in speaking in English. The participants lack confidence and suffer nervousness while speaking in English. Not having an appropriate environment to practice English speaking skill, and negative responses from peers are some other difficulties which they faced in their academic life. However, STEM graduates try to overcome the challenges by using various effective strategies, for instance- watching English contents of the STEM subjects, reading English notes and lectures of STEM subjects to understand the terms and concepts better, engaging in English communication with fellow mates.

Keywords: STEM, English speaking skill, challenges, Bangladeshi graduates, difficulties.

Dedication

I would like to dedicate this work to my parents for their endless support and love and myself.

Acknowledgement

First of all, I would like to express my utmost gratitude to Almighty Allah, for keeping me healthy and fit and giving me the patience and strength throughout this journey. Next, I would like to express my heartfelt thanks and gratitude to my parents, without whom I would not be able to pursue my academic goals and aspirations. My parents supported me unconditionally on this crucial journey.

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Chapter 1: Introduction

In this era of globalization, English language is mainly used as a medium of communication in every sector such as- science, business, technology, medical or any other cases (Afrin. S, 2016). For this reason, different multinational companies want to hire employees who can speak English well. Therefore, in many countries, educational institutes focus on learning English perfectly so that their graduates can gain proficiency in English, especially in speaking.

English is used for technology-based communication in many Asian countries such as Malaysia, Singapore, Maldives and many more. These countries use English for work and to build a strong community in order to develop their culture. So, English skill is the first and foremost requirement anywhere nowadays. However, many articles have shown that many Science, Technology, Engineering and Math (STEM) graduates from different universities have less proficiency in English and because of that they struggled a lot in their workplace as well, especially in the private sectors (Rahman and Pandian, 2018; World Bank, 2009). For this reason, English speaking should be practiced from the beginning so that the young generation can face less difficulties in today's world.

Necessity of English-Speaking Skill in STEM Education

The world is becoming tech-based day by day and the importance of the IT sector is also increasing very fast. In our country, the majority of students are now interested in technological fields because of the increasing demand. In this case, it is expected that the STEM students should have a good proficiency in English speaking to connect with the global world. For this reason, the English language is considered as the most demanded skill nowadays in order to communicate with every sphere of people around the globe (Prabhakar, Litecky and Arnett, 2004). So, from here we could easily understand how important communication skills are in the technology-based field.

English is an important subject for STEM field students as all the advanced courses, whether it is science, mathematics or technology; everything is followed in the English language. In south Asian countries for example- India, Pakistan, Malaysia, Bangladesh or other countries lack English language proficiency. Students in these countries are not habituated to practising English as part of their regular curriculum. For this reason, their speaking skill is quite limited in comparison to other skills which makes it really difficult to achieve a good proficiency in English speaking within a short time (Javed, Mohamed and Sam, 2013). However, according to researcher Mridha and Munirizzaman (2020), 50% of the engineering students are not fluent in English speaking in Asian countries. As a consequence, unemployment and lower career growth of the engineering students are quite noticeable nowadays. Though they are well-trained in technical skills, they need to be skilled in English speaking as well in order to build relations with different types of corporate people or to arrange important meetings with the foreign companies (Gill, Stewart, Treasure and Chadwick; 2008). So, in this tech-based world, having language proficiency in English speaking is an important element for all science and technology background students to cope up with this competitive world (Clement and Murugavel, 2018).

English Speaking Skill of the STEM Students in Bangladesh

In my country, Bangladesh, English is used as a second language and most of the students learn English just to pass the examination. In the case of the universities, there are less opportunities to practise English speaking for the STEM students and they made a curriculum which is mostly focused on enhancing their technical abilities. For this reason, even though our students did well in their academic studies, they lack speaking and communication skills (Afrin. S, 2016). A Critical Investigation of English Language Teaching in Bangladesh (Chou, 2018).

The unemployment rate is increasing among the fresh STEM graduates and the situation is getting worse day by day which affects the economy of Bangladesh (Mridha and Muniruzzaman, 2020). Like other Asian countries' STEM students, 90% engineering students of Bangladesh are trying to develop a decent English-speaking proficiency to secure a well-paid job. Also, some students believe that whatever English they have learned in their academics is enough for getting a well-paid job. But, reality is quite different today as maximum companies want employees with multi skills and a good English speaking skill is one of them (Afrin. S, 2016). In this case, if universities give more priority in practicing English speaking to the STEM students from the beginning, then it will be easier for them to cope up with the difficulties of their professional life (Dannels, 2002). However, most people are not aware of the fact that STEM students also need a good English-speaking proficiency like other department students as well. Many people of our country still think that English language skill is only for the students who are studying in the English department and for the STEM students, technical skills and a good result is enough. But this belief is problematic in this modern world, every sector requires English speaking skill for operating the work and STEM students also need it in their work space as well. Therefore, the importance of English speaking for the STEM students in our country needs to be promoted to the students. According to Khajavi and Abdolrezapour (2023), English language speaking proficiency is not only important for English department people but it is required for students of all streams nowadays to communicate with the global world easily.

Statement of the Problem

Nowadays, English speaking skill is required not only for the academic but also for the professional purposes as well. English speaking proficiency is often required for STEM graduates who are doing corporate or multinational jobs or want to go abroad for their higher studies. It is obviously not a required skill in the workplace but no one can deny that people

having a good English speaking skill are valued a lot compared to others in front of the clients (Damayanti and Listyani, 2020). In Bangladesh, many graduates from science and engineering backgrounds are not good at speaking English. It can be said that the education system of our country is quite responsible for this type of scenario. Majority of the students of Bangladesh have the tendency to pass the exam only by memorising and the teachers lack training to handle this situation (Ansari and Oskrochi, 2004). For this reason, STEM graduates face different types of difficulties in their universities and in their work life as well when it comes to present or to communicate with any clients fluently (Bashir, Azeem and Dogar, 2011). In these cases, a person needs good speaking skills and a large number of STEM students face various types of difficulties in these cases (Akbari, 2015). Also, unemployment is a common phenomenon in Asian countries and many STEM students face this after completing their graduation as they lack communication, presentation and comprehension skills (Charmaz, 2014). With their little proficiency in English speaking, STEM students manage to get a primary job but they cannot achieve higher progress in their respective careers with this minimal skill. In this competitive world, proficiency in English speaking is getting prioritised day by day in many places to hire employees. Many studies have been conducted on the importance of English speaking of Bangladeshi students but limited studies have been found especially on the difficulties of STEM graduates' English-speaking along with its reasoning. As STEM subjects are getting prioritised all over the world, lack of speaking skills can create difficulties in the long run for Bangladeshi students. For this reason, it is important to find out the reasons for the difficulties that STEM graduates' face while speaking in English and what are the major reasons behind this lacking and how they have managed to overcome the challenges. Moreover, the findings of my study will help the teachers of STEM subjects in Bangladesh to improve their curriculum and teaching strategies from the beginning of the university life of STEM students. Also, it will

help the STEM students to know about the speaking difficulties beforehand so that they can find out the ways to overcome it.

Research Gap

There are many studies conducted on STEM students' English-speaking proficiency for instance- Sureeyatanapas and Thalangkan (2016) in their study talks about the importance of English language in every sector of life. Also, (Clement and Murugvel, 2015) and Malaysian researcher (Akbari, 2015) conducted various research on STEM students and found out that STEM graduates have less fluency and accuracy in speaking and there are various reasons behind it. Because of their less proficiency in speaking, they are not able to get a good job in a big multinational organization after completing their graduation and have to face many rejections as well. Because of the lack of awareness in speaking and communication skills, a small percentage of STEM graduates face unemployment problems for a long time. Moreover, most of the STEM students have fluency and accuracy related problems in English language so overcoming it is quite difficult in a short period of time (Chou, 2018). Harmer (2007) has stated that, most of the English courses in Asian countries are taught in knowledge-based format which later creates speaking difficulties for the students.

So far, some studies have been conducted on the speaking difficulties of Bangla medium students of Bangladesh (Raba, 2017) but limited studies have been conducted focusing on the STEM students' speaking difficulties in Bangladesh. That is why, through my research, I will try to attempt to fill the gap of STEM students' speaking inabilities along with the possible solutions so that STEM students can get an overall idea on this topic in a context like Bangladesh.

Objectives of the Study

Through my research, I tried to-

- Explore the English-speaking challenges which most of the STEM graduates have faced in their academic and professional life.
- Investigate the major reasoning for facing English-speaking related difficulties.
- Suggest some of the strategies to overcome the English-speaking difficulties for the current STEM students.

Moreover, by going through my research, the current STEM students can easily understand which areas they actually lack and will get some ideas of improving their English-speaking skills from the very beginning. My research also provides some of the effective strategies of overcoming the speaking difficulties which can help the readers in a good way. However, along with the STEM students, STEM teachers will also get some ideas about the current needs of the STEM students. This may help the administrators to improvise the curriculum of the STEM students as well.

Through my study, I tried to answer the following research questions:

- i. What kind of challenges do STEM students face while speaking in English?
- ii. Why do they face these kinds of challenges?
- iii. How do they overcome these challenges?

Significance of the Study

Nowadays, English speaking skill is considered as one of the most required qualities for the STEM graduates in their work field (Sadiku, 2016). It also played a major role in achieving progress in the professional career as well. Various studies have found that STEM students are quite ignorant in English speaking and they face a lot of difficulties like- social and psychological (Ansari and Oskrochi, 2004). In my study, I have tried to find out some of the possible approaches to solve the common difficulties that STEM students face in their English speaking. Also, my research will try to bring out the reasons for facing such types of difficulties in speaking and the ways to overcome these in the English language. So, my study

will highlight some of the common difficulties faced by the STEM students and try to provide some of the possible solutions which might help others in their future in order to prepare themselves beforehand.

Scope of the Study

My research explores different types of internal and external difficulties that a STEM graduate faces in speaking English. Limited studies have been conducted previously in this field so a broader scope of this topic is fully untouched. So, the setting of my study is different universities STEM graduates who come from different private or public universities and some of them are currently working or in the process of moving abroad. Many of them are in their job or internship period and they are facing problems in the workplace because of their poor English- speaking fluency. My study analyses STEM graduates' English-speaking challenges and its reasoning along with the effective strategies how the students overcome the difficulties. The scope of my research is restricted to the selection of STEM students who have graduated from different universities of Bangladesh.

Chapter 2: Literature Review

This chapter of my research will discuss the previous studies which have been conducted by different researchers on the difficulties of STEM graduates in speaking English. Also, I will try to briefly discuss the reasons for facing such speaking difficulties in the English language and try to discuss some of the possible solutions as well. However, the chapter will also try to fill the gap regarding the difficulties that STEM graduates face because of their poor English language proficiency in a very remarkable way.

Importance of English Speaking Skill

According to Harmer (2007), speaking skill is one of the most necessary things which is needed everywhere. Nowadays, English is required in academic, science, technology and in other sectors as well. For this reason, a speaker has to be very fluent with a good accent which can easily be understood by everybody (Javed, Mohamed and Sam, 2013). We all know that language is the medium of communication and for learning a new language, it is important to learn some skill. To learn speaking in any target language is initially difficult for the learners as they face some of the barriers in it. In most of the cases, learners lack motivation for participating in speaking related activities in their educational institution (Lightbown and Spada 2013,). According to Mandasari and Oktaviani (2018), in Bangladeshi teaching format, the teaching style is completely teacher-oriented and majority of them are not fluent enough to teach in English. Moreover, because of the disorganized syllabus and lack of proper guidelines, students did not even get a chance to learn English properly let alone speaking and this creates a fear of speaking in English in their mind (Alrabai, 2014).

Soomro. M, Channa. M, Siming. A, I and Naz. S (2017) has conducted research on engineering students' speaking abilities and stated that cooperative learning style has a great positive impact on the students. This technique can make the students active which will help them in their long run. Moreover, Mandasari and Oktaviani (2018) also said that some STEM

students use cognitive methods in their speaking that have proven beneficial for them to a certain extent. Moreover, self-efficacy, consistent efforts. Regular practice, motivation are required to develop speaking capability for these types of STEM students (Alrabai, 2014).

Fluency and Accuracy in English Speaking

Fluency and accuracy are one of the most important factors in the English language. Here, a learner tries to be fluent first, accuracy comes second. In English speaking, accuracy and fluency both are quite important for an IT (Information and Technology) student to deal with various types of clients. But the case is quite opposite for Bangladeshi, Chinese, Indian or any south Asian country's students as they are not proficient enough and there are many reasons behind it (Damayanti and Listyani 2019). For instance- poor pronunciation, lack of motivation, anxiety, not practising English speaking enough and many more. Moreover, their speaking inability sometimes affects their mental health as well. Like- hesitation, shyness, anxiety, stammering a lot (Chou, 2018). Researcher Mridha and Munirizzaman (2020) has conducted a study on the Bangladeshi engineering students' English speaking proficiency and finds that Bangladeshi students are quite influenced by their first language Bangla and because of that, they stammer a lot while speaking. Also, they have less vocabulary knowledge and are always afraid of making mistakes in front of everybody. For this reason, they are not able to complete a sentence in most cases. Fluency and accuracy are quite interrelated and when fluency hampers, accuracy automatically decreases for the lack of training from the beginning (Dannels, 2002). So, these two things are quite important for continuing a successful communication in every spare part of life.

Problems in English Speaking

To develop speaking skill in any foreign language is quite challenging for any learner especially in a foreign language context. Mridha and Muniruzzaman (2020) states that, in speaking, selecting appropriate words and sentences based on the situation is not that easy for

a second language learner. According to Renukadevi (2013), English speaking problems are considered as one of the most important reasons behind poor results in English. The reasons why the maximum number of students face speaking difficulties are because of the limited vocabulary knowledge, pronunciation, lack of practice and others. Chou, (2018) said that psychological problems can often interfere with mental and physical health and can affect work productivity too.

Rahman and Pandian (2018) investigated the speaking challenges in their research which shows that the most common challenges faced by the students were the “psychological” (20.70%) which was quite higher than the linguistic ones (19.53%). If the challenges are dealt separately then the grammatical challenges will be 22.16%, anxiety (21.27%), vocabulary will be (20.19%) and pronunciation will score (16.25%). Ahmed (2016) talked about the “Difficulties of Speaking that Encounter English Language Students” at Al Quds Open University and he states about some of the difficulties in the speaking of the students such as- fear of committing mistakes, shyness, anxiety and lack of confidence etc. Akbari (2015) showed that, speaking difficulties can become a major challenge to a foreign language learner as no matter how much they practised, they still face speaking difficulties. Also, many studies have stated that oral language development had largely been neglected in the classroom and most of the teachers did not use it in order to teach the students (Afrin, 2016). Bashir, Azeem and Dogar (2011) had conducted research titled “Encouraging Teenagers to Improve Speaking Skills through Games” and found that learners’ speaking performance was mainly influenced by their lack of vocabulary and fear of being disposed of and the class environment which forced them to develop their speaking skills.

Stem Education

STEM refers to Science, Technology, Engineering, and Mathematics which is an alterable discipline (Afrin, 2016). This concept was first established in the 1990s in the

United States of America in order to recover their global economy (Friedman, 2007). STEM education has also become an important way in developing countries to increase stability, so the demand for STEM education is increasing day by day (Charmaz, 2014).

STEM education is important in every other country now-a-days so the undergraduate programs need to develop it in a proper way. As STEM subjects are important to ensure a subtle economic growth, governments need a long-term policy as well (Larsen and Freeman, 2017). If we look into the developed countries, the U.S.A ranked 52nd in STEM education. However, in the STEM field South Asian countries like China are rewarded 45.9%, Singapore 52% and South Korea 36.8% (according to BHEF, 2010). Usually, students who belong to STEM fields can earn a better salary than the non-Stem students and the amount of the wages can be 26% higher (Rafieyan, 2016).

English Speaking proficiency for the STEM Students

English speaking skill is needed for STEM students both for educational and professional reasons. As English language is the medium of communication with the people around the world, so many STEM students need to multitask in various sectors. For this reason, it is quite necessary for them to achieve a good fluency in speaking to set themselves in the global atmosphere (Raba, 2017). Although STEM graduates are knowledgeable and skilled enough in their respective areas, this is not sufficient enough to convince their clients and board members in the meeting. So, good communication skills in English are much required. Many students have stated that, without having a proper communication skill in English, they will fail to achieve higher success in their life (Yuliani, Najmiah, Hamdani and Pratolo, 2023). A large percentage of the success in the corporate fields depends on the speaking and communication proficiency of the STEM graduates and the rest of that depends on the technical skill (Prabhakar, Litecky and Arnett, 2004). Mridha and Muniruzzaman (2020) conducted a survey on thirty engineering colleges of Orissa where 70% students said

that English speaking skill requires practising the most. Also, they said that they are unable to understand many impromptu things in their work as there is a big lack in academics. For developing a good communication skill, STEM students need to develop their grammar and vocabulary knowledge the most (Sadiku, 2016). In engineering colleges, most of the teachers are not familiar with English language teaching techniques and because of their lack of training, they focus on the memorizing part the most which is absolutely a poor idea to teach English.

English language is needed (Harmer, 2007) for science and technology background students as they have to communicate with their foreign clients and have to deal with meetings and presentations as well (Dannels, 2002). According to the study of Gomleksiz (2007), most of the Bangladeshi engineer's English proficiency level is not good for getting a high paid job in the initial days and the same problems are identified in another study as well by researcher Harmer (2007). His study showed that engineering graduates' TOEFL score is 430 which basically indicates low proficiency in speaking. Moreover, STEM background students face various challenges in their higher education life as well in order to find any part time jobs or to understand any lectures because of the lack of English-speaking fluency, accuracy and accent (Krhutova, 2010).

The Education System of Bangladesh

In Bangladesh, the English medium educational system is followed by the University of Cambridge with the help of the British Council (Rafieyan, 2016). For this reason, English medium students are quite good enough at speaking in English as there are many well-trained teachers to teach them and their curriculum is well maintained. On the other hand, in the case of the Bangla medium schools, all the studies, even English language classes are also conducted in Bengali language so the students of Bangla medium schools are not even qualified to communicate in various places (Krhutova, 2010). Also, the teachers of Bangla

medium schools and colleges are not skilled enough in technological aspects as it is not required in their institutions and curriculum (Ansari, 2004). In most of the cases in Bangladesh, English medium students are getting more priority than the Bangla medium one and according to Poongodi and Periasamy (2020), the reason is because Bangla medium students face severe problems in speaking in English. It mostly happens for the lack of practice of 12 years of general education and it still remains in the university life as well if they read in any STEM subjects (Ansari, 2004).

One of the main purposes of education is to get a good job after completing graduation but now-a-days many students do not even get a call for an interview and this became a common incident in Bangladesh (Renukadevi, 2013). Still, in this tech-based world, it is necessary for the students to update their English so that it can add some value in their career (Richards, 2010). According to Sadiku (2016), the policymakers of Bangladesh education board have modified the curriculum and added focus on achieving English language proficiency.

STEM Education System in Bangladesh

STEM education is the most demanded subject or stream throughout the world nowadays as it allows the learners to connect with the different global issues. In the developed countries, it is already included in their educational system (Akbari, 2015) but for Bangladesh, our country is still far behind in this stream. In our country, STEM education is not up to the mark as various resources like- laboratories, well designed curriculum are still missing in the educational institutions. Also, Bangla language is being used everywhere to teach the students which creates a negative impact of the science, mathematics related subjects in our country (Simon, 2020). Renukadevi (2013) has mentioned that, various NGOs in Bangladesh volunteered many awareness campaigns to conduct some sessions on STEM education to motivate the learners as well. Moreover, according to Krhutova (2010), the major intention of

this kind of programme is to help the rural of Bangladesh so that they could learn more about STEM fields and can join different training related to STEM subjects.

English Speaking Abilities of Bangladeshi STEM Students

The necessity of learning English language is increasing day by day in the STEM field as technical people have to communicate in English to connect with anybody throughout the world as it is the medium of communication with other country's people as well (Sadiku, 2016). But at maximum, STEM students of Bangladesh are less proficient in English speaking so they have to face unemployment problems after they finish their graduation and it is the biggest problem nowadays. Chou (2018) and Simon (2020) in their studies states that engineering students lack pronunciation and fluency. Also, they often made grammar mistakes as well. Soomro, Channa, Siming, Rajper and Naz (2019) also claims that, in many public universities, STEM subjects are taught in Bangla so that all types of students can understand easily. Though it sounds like a good idea, it damages the future of those students who want to pursue their higher education abroad. However, in private universities English is used to teach the STEM students but in a limited context which is not enough to develop a good English-speaking proficiency (Sadiku, 2016).

In Bangladesh, students learn the English language just to pass the exams, not to build any skills, so this is a big reason for not having an overall English skill. Rahman and Pandian (2018) shows in their study that 82% of engineering students of Bangladesh are now facing problems in their job sector for lack of English-speaking proficiency. However, 40% of the students face difficulties in their TOEFL and IELTS test in speaking sessions (Raba, 2017). So, it is quite required to apply different types of teaching strategies in the classroom to ensure a proper interaction between teacher and the students in order to develop their communicative skills in English language (Sureeyatanapas, Boonma and Talangkun, 2016).

Chapter 3: Methodology

This chapter briefly discusses the methodology which I have used for conducting my research. It includes the purpose of the study, research design, related theories and framework, data collection procedures, data analysis and other relevant things related to this section.

Purpose of the Study

My research has been designed to highlight the challenges which the STEM students face while speaking, major reasoning for facing these difficulties and the ways from overcoming those challenges. Maximum number of STEM students face speaking difficulties while communicating in English with others. There are various reasons behind this and many studies have been conducted indicating this issue. But there is no such study which particularly highlights the issues of STEM students of Bangladesh. Therefore, in my study, I will try to enlighten on the facts of the research questions and endeavour to explore the responses of different private or public university students' speaking difficulties.

Research Design

To conduct my research, I chose a qualitative method as it is considered as the process of investigation which interprets the meaning of a different person's perspective about any phenomena (Creswell and Guetterman, 2018). In my study, the qualitative method helped me to investigate the answers of my central research questions and explore the phenomena related to it. In the case of quantitative research, the data are numerical based on the surveys but for my research, I needed in-depth information of my participants based on their experiences of English speaking difficulties. As this type of detailed information is not possible to get by doing quantitative research, I chose a qualitative approach in order to collect the information deeply from my eight participants which can fill the research gap. The data which I have analysed in my paper is non-numerical. I interviewed five students and

three teachers to gain the data. This study mainly focuses on the interview questions and answers. In my interviews, I have used open-ended questions from my participants who studied in different universities in STEM subjects and trying to find a job or already doing a job. Moreover, some teachers of STEM subjects are also being interviewed to know about their perspective and causes for having speaking difficulties for the students. My research has been conducted with the intention to explore the STEM students' difficulties in terms of English language speaking. My research is descriptive and naturalistic in manner. To analyse the qualitative data, I have used thematic analysis. Then the data is coded based on some of the themes related to this study and then analysed systematically.

Research Site

This section of my research mainly provides the idea where my research takes place. My study focuses on two groups of people, STEM subject teachers and students. All the students graduated from different public and private universities located in Dhaka city and majority of them are working right now or preparing for their higher studies. So, the interviews are taken online via Google meet in their convenient time. Same goes for the teachers as well. Three of the teachers of my study are currently teaching in three different private universities located in Dhaka city. Though two of the teachers of my study had graduated from different public universities, they are now teaching in private universities. However, I tried to contact the teachers who teach at public universities with the help of a friend but he did not fulfil all the requirements for becoming a participant in my research. Another public university teacher showed her interest but later became unreachable so I could not be able to reach any STEM teachers of public university at that short period of time. If I were able to interview STEM teachers from public universities, I would have been able to compare the findings adding values to my study.

At the time of conducting the interview session with the participants, the teachers were quite busy because of the ongoing quiz or mid exam in their respective universities. Because of this, they preferred giving interviews online instead of meeting me outside. So, the interview session with my participants was conducted online and all of my participants help me throughout my research whenever I need any kind of formation. So, my research site is mainly Dhaka city located in Bangladesh.

Participants of the Study

For conducting my research, I have chosen STEM graduates from different universities in Bangladesh as the central objective of my research is to explore the Bangladeshi STEM students' English-speaking difficulties. Before collecting the data, participants were informed about my research nature and objectives. Based on this, five STEM graduates along with three STEM faculties willingly show their interest to give an interview to help me in my research. The average age of the students are 23-27 years and the average of the faculties are 27-30 years in my research. As all the participants are from different public or private universities studied in different STEM departments, it would be effective to enlighten the facts of the different department students and their thoughts on English speaking difficulties and the ways to overcome it.

Information about the participants (Graduates)

Participant Name	Age	Department	Medium of instruction	Profession
Emad	23	EEE	Bangla	Graduate
Anushka	25	EEE	Bangla	MSC student
Nayem	25	CSE	Bangla	Working in an airline company
Raisa	27	Biotechnology	Bangla	Intern in a pharmacy company
Moumita	25	CSE	Bangla	Freelancer

Table 3.5.1 Participants information (Graduates)

Information about the teacher participants

Participant Name	Age	Educational qualification	Department	Current workplace	Training received
Farhan	29	BSC from X University	CSE	Lecturer in the same University	No
Sadia	27	BSC from Y University	CSE	Contractual faculty in the same University	Basic class management training
Iffat	30	BSC from Z University	EEE	Lecturer in Y university	Yes

Table 3.5.2 Participants information (Teacher)

Instrument

Self-developed open-ended questions were constructed for my study. The questionnaire which I used for my research is used as an instrument for data collection. There are basically two sets of interview questions set for the two groups of people. One for the students and another one for the teachers. The interview questions are simple and open-ended so that the participants can talk about their experience in their convenient way and there are no such limitations of time and words. The interview questions are modified with the help of an instructor to ensure the validity of the research. As a researcher of my study, I will play the main instrument here as I will be adding my direction throughout the study.

Data Collection Procedure

There are many ways to collect data for qualitative study and for conducting my research, I have basically interviewed the participants for collecting data broadly. According to Creswell (2015), in qualitative study, the researcher can collect data through observation, analysis of the documents and also from interviewing the participants (p. 205).

First of all, to get in depth information for my study, an appropriate purposive snowball technique has been followed throughout my research. The reason behind choosing

this technique is that it is considered as the most reliable option to get access to the selected participants. I just need to choose a few of them who can provide me with proper information. Moreover, participants are mainly selected based on some of the major criteria. For instance- participants need to be from a STEM background, Bangla medium schooling and have some English-speaking difficulties so that they can relate with my research and can help me in it. The reason for selecting participants according to these criteria is, people who came from the same context provide actual information about the reality of the situation. However, it is easy to get in-depth information from the participants who are participating freely in my study.

In order to select the participant, I had contacted my batch mates Emad and Moumita first as they are from a STEM background. As they willingly show their interest in my research so I have finalized them and they help me throughout. They supported me from the very beginning and also suggested two of their friends. I have talked with them personally and initially they both showed their interest but one of them became unavailable later. That is why only three participants (Emad, Moumita and Anushka) who were students, had been selected in the initial phase. On the other hand, some teachers are also needed to conduct my research. So, I have contacted two of my batch mates (Farhan and Sadia) who became faculty later in STEM subjects in their respective universities. It took a week to talk with them to discuss my research as they are quite busy in their professional life yet they both agreed to participate in my research and give their preferred time as well. After conducting the interview of these participants, I realized that the data is not efficient enough for my study. I need some more participants so that the result can be valid. For this reason, I have contacted my cousin Nayem to help me with this as he fulfilled the criteria for the participants. He agreed to help me and gave me two more participants as well but as one of them did not fulfil the criteria, I had to skip him and took only Raisa as my fifth participant. In this way, I

choose these five students as my participants who fulfilled my criteria for this research. On the other hand, my batch mate Sadia also helped me to find a participant (named Iffat) who is a STEM subject teacher. Sadia gave me her number and I talked with her about my research. She initially gave her consent to participate in my study but as the semester final was going on in her university she told me it will take some time to sit for an interview because of her busy schedule. So, I waited almost two weeks and then finally we sat for an interview session with Iffat. In this way, a total of five students and three teachers from different universities who are from STEM subjects agreed to participate in my research and they all were interviewed. The reason behind choosing these three teachers from the STEM department is that they are teaching the STEM students for quite a few years so they know in which areas STEM students mostly face difficulties in speaking English. Moreover, they can also give me the idea about the medium of instruction which they usually follow to teach the students and the importance of English speaking in different STEM areas throughout their life. However, the methods which I have used for collecting the data are described below-

Semi- Structured Interviews

For collecting the data for my research, I chose a semi structured interview for my participants so that they can have the opportunity to discuss everything elaborately (Charmaz, 2014). The semi-structured interview allowed me to have a deeper understanding of the difficulties which my participants face in English speaking (Gill, Stewart, Treasure and Chadwick, 2008). For their convenience, I have sent the questionnaire along with a consent form beforehand to all my participants and when they agreed, I held the interview online on their preferred time by Zoom call. The length of the interviews was around 20-25 minutes and the language of the interviews was English. By taking the participants' consent, I recorded the interviews as well. I asked them whether they are comfortable to show their face

or not, as most of them are not comfortable so I did not force them to switch on the video rather I recorded the audio only.

The interview questions were mostly open-ended so the participants can give detailed answers. My research is mainly based on the interviews of the participant's self-observation and experience on their English-speaking difficulties

Analytical Memos

Analytical memos are quite useful in data collection procedures in qualitative studies as they can be coded. According to Marshall and Rossman (2011), writing notes, reflecting memos and thoughts are important to create new ideas for the research. For this reason, throughout the process for collecting data of my research, I wrote the analytical memos for each and every step that I am taking and also the changes which I am making in my research. Later, I used those memos as my data in this paper.

Data Analysis

According to Goldenberg (1992), data analysis includes the interpretation of data which is gathered through analytical and logical reasoning from surveys and interviews. While analysing the data, one must keep in mind that, "Analysis strategies have to be compatible with (Maxwell, 1998)." Keeping all these things in mind, I am going to analyse the collected data from the interviews to find the answers of my research questions. For analysing my data, I mainly followed the process described below-

Phase One

My first phase of analysis took place before interviewing the participants. At first, I read the initial journal, articles and different research papers related to my study and randomly coded them using the research questions. Also, I have gone through the papers which were published by some of my participants to know more about them and their English

language knowledge. After go through some of the research papers, I coded some major points which related to the following specific questions for each participant-

- What is the medium of instruction for your STEM classes? Do the students feel comfortable using the English language in the class?
- What type of feedback do you receive from your peers or faculty members when you make any kind of mistakes in speaking in English?
- What steps have you taken till now to improve your English-speaking skill?
- Why are they lacking English-speaking skills? Elaborate properly.

These are some of the major questions which came to mind after reading various articles for my research. I felt these questions are quite important so I have specially noted these questions so that it cannot be missed in the interview sessions at any cost

Phase Two

After conducting the interview with all my participants, I transcribed the audio of each interview using the same set of questions designed for students and teachers on a table of MS Word files respectively to reproduce the original texts of each participant. After the first interview session, I had reviewed the interview questions so that they addressed my research questions properly. I have also revised some of the interview questions as well so that I can get exact information which is needed for my research. Whatever my participants said in their interview, I carefully wrote them verbatim with all the pauses and expressions. Then, I read and reviewed all the transcripts and matched them with the original recordings again.

Phase Three

After that, I got the interviews coded using the same set of questions and generally highlighted some of the important points as well. It was the initial coding so none of the major themes were able to be generated in this phase.

Phase Four

After the initial coding, I have conducted the second phase of coding based on predetermined categories from the previous phase in order to generate themes. Some themes are - difficulty in speaking skills, problems in fluency and pronunciation, faculties using Bangla language, lack of motivation in speaking English had been generated after the second phase of coding. Here, I categorized all the coding according to the groups and common meanings determined by the coding. Based on the coding I created two tables, one for the students and other for the teachers. The major categories are sorted out to find the themes from the data that were arranged by me.

Phase Five

In this phase, I have conducted a follow-up interview session with all my participants and shared the transcription as well. I told them to go through their responses and if they like to add anything new. None of my participants wanted to change or add anything in their narratives and they liked my representation of their thoughts as well.

Phase Six

In this phase, I analysed all the discussions, interview narratives and the feedback which my instructor gave me throughout the data collection. The data were mainly arranged by doing the interview analysis and by following these steps. These are- familiarization, coding, generating themes, name the themes and finally defining those. The data were used to identify the quotes which illustrate participants' English language speaking difficulties. In the last step, I analysed all the relevant themes and analysed the major reasons for having English speaking difficulties of the STEM students and some of the ways to deal with it.

Trustworthiness and Credibility

In my research, I removed all types of identity markers of my participants such as names and have used pseudonyms for all my participants. I analyse the data by multiple

coding which increases the trustworthiness of the study. After transcribing the data, I have shared the transcription with my participants so that they can see the process of my research and can give their opinions as well or if they like to add something new. Moreover, by sending the consent form, I assure the voluntary participants for this study. Also, I have used detailed descriptions for analysing the data so that the results can look more sensible.

Ethical Consideration

As a researcher, I was always respectful towards my participants throughout my study and tried to ensure their responses remain confidential. I informed them about my research beforehand and they are quite flexible to ask me any kind of questions as their queries. Also, I received an approval from my advisor on the consent form as well where a short outline of my research, benefits of it and some potential risks have been mentioned with the confidentiality statement.

Informing Participants

At first, I shared primary information about my research to my participants in an email where I told them about the purpose of my study, why I am interested in doing it and why they are important as my participants. I also told them about the benefits of this research as well. Most importantly, I assure them that their information would always remain confidential and would be used for this research only. When the participants agreed to take part in my research, I sent them a consent form and told them to read it properly and put their signature in it. When they all agreed on this, I handed over the semi-structured interview questions to them prior to the interview session so that they could go through the questions. They also have the freedom to decline answering any questions if they are not comfortable in it. Luckily, none of the participants have declined any of the questions during the interview session. The interviews are conducted according to their convenience and I was very careful

to use proper language while asking any questions to the participants so that it does not show any biases on the topic.

Participant Privacy and Anonymity

I ensure the anonymity of all my participants. The data which they shared was kept confidential and the participants' privacy was maintained in a strict manner. During the interview, I mentioned to my participants that I will use pseudo names and their real identity will not be revealed in any way. I gave my participants the options to choose different pseudo names for themselves and I have used those in my research. I took most cautions so that their identity will remain concealed. Moreover, I kept my interview and other data and password protected in my personal laptop which is quite secure as I am the only user of it.

Chapter 4: Findings

This chapter presents the findings of my study and the result is organized in such a way that it addresses the research questions well. The chapter is divided into three sections. Section one will describe the challenges that STEM students' face in speaking in English and it is related to research question one. Section two will be discussing the reasoning for facing this kind of challenges in speaking which will relate to research question two and lastly the third section will discuss the strategies they adopt to solve their speaking difficulties.

Challenges that STEM Students Face in English Speaking

This section of my research will thoroughly talk about the challenges that STEM student's face in English speaking.

Anxiety

Anxiety issues create a lot of challenges in every sector as it is a negative feeling and can cause hypertension as well (Gardener, 1989). Students having poor English language learning experience face anxiety problems the most even in their workplace. For this reason, they feel helpless and suffer a lot so they cannot even try to communicate with others as they feel anxious and shy while talking. Also, researchers Setiyadi, Wicaksono and Mahpul (2019) in their research states that, maximum Chinese people feel anxious while talking in English as they have poor English-speaking skills and just like them, it is the main reason in case of Bangladeshi STEM graduates as well. While conducting the research, I have asked my participants if they feel anxious while speaking in English language and one of them named Anushka said that, "Sometimes she feels anxious as she is not able to find the right words or say my words in an organized way." (DU AN 30). Another participant Nayem stated that he feels very uneasy to talk in English with his colleagues and often faces anxiety attacks for being tense when it comes to talking in English in his workplace. To address anxiety issues, Emad also said that he often suffers from anxiety issues even till now in his Master's classes as well

when it comes to presenting something in English language (DU EM 28). Moreover, apart from the participants, all of the teachers have also admitted that anxiety issues are very common between the students and most of them become very anxious and begin to sweat as well during the presentation. Iffat said that, “As STEM students’ gets less opportunity to talk in English in the class, sometimes they get anxiety attacks while presenting in front of everybody. It happened a few times in my classes as well.” (DU IF 30). Farhan also added that anxiety and panic attacks are quite common especially for the STEM students and it lowers their confidence as well so STEM students’ needs to work on this thing. So, this difficulty is quite common in the majority of the STEM students who participated in this study.

Lack of Fluency

Harmer (2007) in his research mentioned that fluency focuses on speech to communicate effectively with others as STEM students do not have any habit of speaking in English on a regular basis. They speak English very occasionally so a common problem of hesitation always remains in their speech.

Nayem also faced this problem and said that,

If I talk about my proficiency so definitely, I can say that, I am not that fluent in talking in English because apart from talking with my faculties, I did not use English at all. So, the lacking always remains. (DU NA10)

Another participant Raisa said that fluency is the major problem for her. As a Bangla medium student, English is always a tough subject for her. Also as a STEM student in the university, she never gets the chance to practice English-speaking in a mannered way (DU RA 10).

Moreover, Moumita also stated that she is working as a freelancer now so speaking in English is a part of her life. Though her English-speaking improved a lot, fluency is a thing which still creates problems for her and she thinks that it will take more time and practice to become an absolute fluent English speaker in the English language. Emad also told,

As I am preparing for my higher studies, fluency is the most needed thing for me. But honestly, I am suffering a lot in this even though my IELTS classes are not that helpful for me to achieve fluency in English in that short time. (EM16)

Besides the students, teachers also mentioned about the lack of fluency of the STEM students. Farhan said in his interview, though many STEM students in his class have overcome a lot of difficulties of English-speaking but somewhere they also face difficulties with fluency. It is the hardest thing to overcome in his opinion. Adding to that, Iffat also mentioned that, though she gives a lot of English-speaking activities in her class still students did not feel that comfortable in communicating in English and did not practise English-speaking even in the class as well which creates more difficulties to achieve a good fluency. Basically, lack of practice is the main reason for not having a good fluency for the STEM students. So, these are definitely the major findings in the case of fluency in English speaking.

Grammatical Challenges

The most common problem which a STEM student faces is grammatical challenges. As they have less exposure to the English language, they often find it very difficult to use correct words when they try to speak. Almost all the participants have mentioned this in their interview. Participant Anushka stated that, “In English- speaking, I face difficulties to find the right verbs when I am trying to say anything, it is the most challenging thing for me” (DU AN 12). Other participants Moumita and Raisa have also stated that grammatical difficulties are quite critical in English-speaking. Raisa said that she often tries to speak in English in her office but she makes a lot of grammatical mistakes while speaking and for this reason she hesitates a lot to speak further in the English language. On the other hand, Moumita said that,

“As I am a freelancer, I face a lot of difficulties quite often for making lots of grammatical mistakes while talking to any client. It is quite embarrassing for me and

often I get stuck for some moment for not finding the proper word. It hampers my work sometimes. (DU MO 16)

Moreover, another participant Raisa told that, though English-speaking is not that needed in her work-place still when any client comes to visit, speaking in English definitely adds value but because of making too many grammatical mistakes, she chooses to stay quiet (DU RA 16). It is of course a negative thing for her and her career. Anushka stated, she didn't care much about the grammatical challenges and kept talking in English in her MSC classes or in the presentation but the peers laughed sometimes and it demotivates her a lot. Besides the students, teachers also agree with the same. Iffat mentioned that, "Students made a lot of mistakes in the grammar while speaking in English and mostly it happens because of not practising English- speaking well" (DU IF 16). Sadia further added, maximum students stammer a lot and make lots of grammatical mistakes but she still encourages students in English-speaking so that they can try to speak in English in the class at least.

However, according to Rafieyan (2016), a maximum of the STEM students faced grammatical challenges in every English skill and it cannot go away easily. It is a vast thing to cover and cannot be done easily. For this reason, maximum students felt shy to talk in English as they have poor grammar knowledge.

So, it is evident from my study that grammatical problems are a big challenge in English speaking for the STEM graduates and as they are not practising it regularly so it hampers their speech.

Lack of Vocabulary

The knowledge of vocabulary creates a huge difference in English speaking. A person who has a rich vocabulary can organize his sentences really well and makes him a knowledgeable one (Javed, 2013). But for the Bangladeshi STEM graduates, the scenario is really bad. They did not practice speaking English that much. Also, they mostly follow

Bangla or sometimes even Hindi lectures to understand their topics well so they have a poor knowledge of English vocabulary. One of my participants, Emad, states that, “For English speaking, the most challenging part is, I have poor vocabulary skill and sometimes, I cannot find an appropriate word to say. That is the challenge which I face quite often” (DU EM 14). Sometimes, students fear to talk with people to talk in English as they are not good enough in this language. Vocabulary problem is one of them and it can also decrease their confidence as well (Mridha and Muniruzzaman, 2020). So, limited vocabulary really creates challenges in speaking English for the STEM graduates in their daily life.

Participant Nayem stated that as he is working in an airline company, he needs to use English a lot. But as he lacks English vocabulary, he often chooses to stay quiet. He said,

As I lack vocabulary, I face a lot of difficulties in my job. When any foreign client comes to our office, the management always prefers the employees who can speak in English without any kind of interruption. So, for this reason, I always led behind. (DU NA 18)

Moreover, Anushka also stated that because of the lack of practise in English-speaking, she repeats the same words multiple times, it does not sound good but it has become her habit also learning new words or practising it for speaking is not easy for her at this stage. The teachers who participated in my research have also said that poor vocabulary is a big challenge for maximum STEM students. Iffat said that, “If I use some advanced English words, the majority of the students in my STEM class do not understand it. It shows their knowledge about English vocabulary” (DU IF 20). Sadia further added, maximum STEM students in her class use the same words again and again with a lot of hesitation. It clearly shows their limitations in English vocabulary. Farhan also mentioned about the same in his interview and said, even some of the STEM students start working on their vocabulary but it will take a huge time to develop a good English-speaking skill.

Poor Pronunciation

Proper pronunciation and a good accent that can make a speech sound pleasant but the fact is, it is quite difficult to pronounce all the words correctly in the second language scenario and in my study, some of the participants have admitted that they faced difficulties in their pronunciation as they are not used to speaking in English on a regular basis. In the interview session, one of my participants, Moumita, said that, “Though I can speak quite fluently in the English language, my pronunciation is not good and I make lots of mistakes while speaking” (DU MO 24). Another participant Anushka said that, when she makes mistakes in pronouncing any word, some of her MSC classmates laugh which embarrasses her a lot so she feels demotivated to speak in English in front of everybody. Nayem also stated that as an airline company employee he needs to use English to speak in front of the clients but accurate pronunciation is a big problem for him. The clients mostly speak in foreign accent which is quite hard for him to learn at this stage and felt quite bad about it. Moreover, Moumita also stated that, as a freelancer, she worked with various clients and they mostly speak in native language. This helps her a lot in improving her English speaking but there is more room for improvement and will take more time. She also added that, native speakers help her a lot with the proper pronunciation of many known words.

Iffat said that,

Because of the Bangla medium background and not practising English throughout the academic life, it becomes very difficult for the STEM students to pronounce all the words accurately and it eventually decreases their confidence to speak in English in front of the people as well. (DU IF 28)

Also, many STEM students did not understand the importance of English speaking in the first place but when they realize, it becomes late to start from the beginning in most of the cases.

The Major Reasons for Facing Challenges in English Speaking

In this section, I will discuss the reasons why Bangladeshi STEM students face challenges in speaking in English.

Lack of Favourable Environment

To learn any new language, a good environment is the most needed thing but it is sad that this type of environment is missing in Bangladesh. Even though the majority of the university have speaking labs and libraries, students hardly get time to go there and practise English speaking (Prabhakar, 2004). Also, there are no strict rules by the institutions as well or they don't have any allocated mark for going to these labs for speaking practises so they feel unmotivated to go there. My participant Raisa states in the interview,

We have labs, libraries as well and if anyone feels like going to these places they can easily go and practise English speaking. In the initial days I used to go there but not for long as there is just one instructor who helps us with the instruments and mostly, she was unavailable. (DU RA 8)

Emad has also stated that, "In my university, there was a lab for practising English speaking and listening but there is no such instructor and instruments available there and hardly majority of the students know about it" (DU EM 10). Moreover, Nayem and Moumita have also mentioned that his university did not have any speaking or listening labs for practising English speaking. They just have the library but as it was very crowded all the time so practising any language with friends is not possible in those cases.

Also, many teachers are not that much aware to talk about the necessity of English speaking in their STEM field as well. One of the STEM faculty Iffat said that in Bangladesh, most of the educational institutions lack space for the students to practise anything creative unlike the foreign countries. Farhan also added, in our country, schools, colleges or even the universities lack in creating the environment for the students to practise English speaking or

any skills in their institution. Though speaking skill is the quite required skill in the STEM fields nowadays, so English proficiency is also needed. But because of the unfavourable environment many students were behind (Rafieyan, 2016). It is quite a big problem in Bangladesh which needs to be solved.

Teaching in Bengali Language

It is the most common phenomenon in our country that, in almost every institution, STEM subjects are being taught in Bengali language. Almost every participant in my study (students and teachers) states that they are learning and teaching STEM related content in Bangla. Moreover, institutions are much more flexible in this case and teachers and students both use Bangla to understand any topic related to STEM subjects (Chou, 2018). My participant Iffat stated that,

It is advised to take classes in English but as I am taking classes for the EEE department especially the circuit courses so it is not that much possible to talk in English all the time so I have to talk in Bangla maximum time. (DU IF 10)

Another participant Sadia stated that she also uses Bangla to teach in her class as the students prefer it. She also added that, on the first day when she asked the class in which language students feel more comfortable, the majority of the students said Bangla so she also uses this language after that. Farhan said in his interview that he tried to teach in English and if any students face difficulties, he again explains it in Bangla but it takes a huge time. Also, the university is quite lenient in this matter and the students are mostly from Bangla medium background so he teaches in Bengali language most of the time.

It is alright to teach some contents in Bangla for better understanding but if the teachers do this on a regular basis, then it is quite alarming and STEM students are facing the consequences already (Bashir, Azeem and Dogar, 2011). Teaching in Bengali all the time is quite a bad practice in the STEM field (Mridha and Muniruzzaman, 2020). Teachers and

students need to understand this quickly. Because of the less exposure to English language even in the classroom, STEM students find it way more difficult to learn English speaking later.

Negative Feedback

It is another common problem and a barrier in learning English. As Bangla medium students already have less fluency and exposure in English, it is obvious that they will make a lot of mistakes in speaking. But many students make fun of it and even teachers did not see this in a good manner. Sometimes teachers give negative feedback in the class which eventually demotivates a student (Rahman & Pandian, 2018).

My participant Emad stated that, when he tried to speak English in his class many students made faces which demotivates him a lot as peers' opinion matters a lot in the minds of the young students. Moreover, Nayem said that he has to give a presentation in his workplace now and when he tried to use English a bit, he made some grammatical and pronunciation mistakes which is really very common. But his colleagues and even the clients sometimes feel dissatisfied by his performance which breaks his heart. Moumita also stated that clients even stop her in the middle of the conversation if she made any mistake in English speaking which is quite bad but she anyways deals with it. Anushka mentioned, "I am practising English speaking in a language centre but some people make faces there as well if I made any mistake which disgust me. I feel very low in these cases" (DU AN 80).

Because of the negative feedback from the faculty and peers, maximum students are scared to speak in English (Sadiku, 2016). Some really wanted to practise English speaking but negative feedback demotivates them easily and the lacking always remain even after their graduation and in their jobs as well. In my research, very few participants also talked about this matter and it is quite upsetting that many STEM students had to face this kind of negative comments while speaking which eventually decreased their interest in speaking English.

Strategies to Overcome with the Speaking Difficulties for the STEM Students

Now I would like to discuss the strategies used by the STEM students to cope with the challenges they face while communicating orally with others.

Practising in front of the Mirror

Participants in my study stated that they use different strategies or techniques to practice English speaking and practising in front of the mirror is one of them and it helps some of them to gain confidence. Emad said that, “The difficulty I faced in English speaking such as lack of vocabulary in public speaking and grammatical difficulties. To overcome these, I try practising English speaking by myself in front of the mirror by reading English books or sometimes English newspapers as well. It increases my confidence and helps me with the vocabulary knowledge” (DU EM 40). Another participant, Barbie also stated that practising in front of the mirror helps her a lot in increasing the fluency in speaking.

Sadia stated that, “Practicing alone in front of the mirror is actually a good idea in the beginning as it gives confidence to the students and the person can see the expression, hand postures as well so they can easily control it when they talk with others” (DU SA 42). Iffat also mentioned, the technique is good for practising English- speaking to decrease nervousness and anxiety for some of the students but might not be effective for others. But it can be a good technique to start practising at least. Moreover, my participant Raisa has also found some positive sides of practicing speaking by looking at the mirror and speaking in front of the mirror as it helps her to boost confidence level. Researchers Soomro and Channa (2019) also talk about this and according to them, it can initially be tried to remove nervousness but one should not get used to it as well. However, it can be a good option for the STEM students to practise English speaking and to gain some confidence. While doing the research, I have experienced that participants who practise in front of the mirror quite a

certain gain a sort of fluency as well so it can be a good start for the STEM students hence proved but they have to keep working on it regularly.

Watching Contents or Talking with Native Speakers

In this era, various contents and interviews are available on YouTube so many non-native speakers who have less proficiency in English speaking watch this to learn English speaking (Clement and Murugavel, 2015). Now-a-days many students watch these types of videos on a regular basis to learn some strategies of English speaking and also to prepare themselves for their higher education. One of my participant Raisa told that,

In order to develop her vocabulary and accent problem; she usually watches her favourite foreign sports person's and business person's interviews and tries to copy their tone while speaking. It helps her to build a good accent and can know about many business strategies as well. Moreover, they are native speakers of the English language so it is quite helpful for her to pick up the original accent of speaking. Another participant Moumita stated that,

I have made some foreign friends so that I could talk with them in English because it wouldn't help you if you talk with Bangladeshi people in English because they are also like you most of the time. Foreign friends can give you feedback and as it's their language so you can understand your mistakes easily. (DU MO 34)

Anushka also told in her interview that she was preparing for her higher studies in the U.S so speaking in English fluently is very important for her. For this reason, she is preparing a lot in her free time and mostly she watches the contents from the United States so that she can learn good English with their accent. It is obviously quite tough but she is trying to manage somehow. Farhan also said that, when he went to Canada for his Masters, foreign contents really helped him a lot to learn about many words which are unknown to him. This strategy increases his vocabulary knowledge and also corrects his pronunciation as well.

From the above discussion, it is evident that some participants found it helpful to watch videos or talk with the native speaker often in order to learn English speaking techniques and new vocabularies. Furthermore, practising them out made them more confident which eventually helps them to overcome their speaking difficulties.

Watching English Movies or TV Series

Today's generation is quite interested in watching the latest movies and series. Though they watch these just for entertainment or to pass their free time, they can actually learn a good amount of vocabulary if they really pay attention to them. Some of my participants said that watching good movies with subtitles helps them to learn some new words. Moreover, they can also know about the proper English accent as well. Talking about this, one of my participants Anushka said that, "I really like watching English web series as it helps me to learn English more but the most important thing to learn English is practise" (DU AN 36). Nayem also said that he watches English series and movies a lot and he learned few words and their proper pronunciation as well (DU NA 34). Raisa stated in her interview that though she likes to watch English movies, learning English is quite tough by only watching these. She also added that she definitely learns some new words by watching English movies but achieving a good fluency in speaking is a vast thing to achieve. Sadia also stated the same and told, though she learned quite a few new words by watching English contents but speaking needs a lot of practises and it cannot be possible within a short time or just by watching. But it cannot be denied that some of my participants' vocabulary improved a lot which is a good thing. Participant Emad also added that watching English series is quite fun but he discovered that his vocabulary and speaking pattern developed a lot by watching these. He learned many new words and tried to use those in his conversation with others in the workplace. It grabs the attention of the others and he gets a lot of appreciation for that sometimes.

According to Richards (2010), Movies and other content can be good alternatives to learn English vocabulary or to listen to authentic English speaking but utilizing them is quite challenging. Also, some notes can also be taken if the learner found any new words so that they can remember it very well.

Joining a Language Centre

Joining a language learning centre can be considered to be an effective way to practise English speaking as learners get the opportunity to practise speaking there. It might be not effective for some learners but at least it can decrease their nervousness in public speaking to a small extent (Dannels, 2002). Participant Raisa told in her interview that,

I basically practised a lot by myself and joined Mentors for a short course in English for my IELTS. Though a three month short course is not enough to get fluent, I practise speaking English there which is quite fun. (DU RA 38).

Similarly, Moumita also said that she is taking some online courses for her listening and speaking activities so that she can improve her English speaking, which is important in her freelancing career. Moreover, Nayem also added, he went to the British Council for improving his English language skill and learned some basic techniques which helped him in his presentation skill the most. So, it was a good experience for him as he practised English-speaking with some other fellow mates there which was quite difficult in the university or other educational institutions. However, Farhan also said in his interview that these special English classes can be a good start for improving English speaking skill but a person needs to practice those lessons daily. Whatever they learn from the language institute, in the end practice is the main thing. Talking about the same Sadia also said that, some of her students mentioned that they took online or offline courses on English speaking skill and this really helped them to do better in presentation and communication as well. So, according to her,

these language learning centres can be a good option if any STEM students want to enhance their speaking or any other skills in the English language.

According to Sureeyatapas, Boonma and Talangkun (2016), language centres are good for practising or flourishing some English skills only, one cannot learn English properly by just going there. Bashir, Azeem and Dogar (2011) also thinks that language centres are just to help the learners, not to teach thoroughly. However, in the case of Bangladesh, as STEM students did not get any opportunity to speak in English with anyone so joining a language centre can definitely bring a positive impact in their mindset and it is a good way to at least start practising English language.

Chapter 5: Discussions

In Bangladesh, English language skills of the students are not satisfactory often due to faulty language teaching methods and materials, Grammar translation method is still widely used in Bangladesh in all levels of education. In Bangla medium educational institutions, teachers use their L1 to teach English which plays the biggest role for students to face difficulty in English speaking since there is no focus on speaking and listening skills. Even in the universities, there is less scope to practise English speaking (Gomleksiz, 2007). Teachers might use Bangla to make the lessons more understandable to the students but this badly hampers their productivity in English language in the long term. Moreover, in the case of the STEM subjects, learners hardly get any opportunity to practise English which directly hampers their post-graduation life as well (Alrabai, 2014). Students who want to go abroad for higher education suffer a lot for lack of English-speaking fluency and suffer numerous visa rejections as well (Akbari, 2015). Though STEM students try to overcome their difficulties by using various strategies like- joining a language centre, watching English STEM contents etc. In this chapter I would like to summarize the major findings and discuss the results of my research.

Major Challenges in Job Sectors

To do well in the STEM fields, English language is often needed especially in multinational companies, since English language plays a vital role in communicating with the outer world (Charmaz, 2014). However, people in Bangladesh always face problems in learning the English language and achieving a good proficiency in speaking (Arfin, 2016). Because of not having good proficiency in the English language, most of the STEM subject employees feel less confident and nervous while speaking and they are mostly stuck while talking in the English language with their clients. According to some of the participants of my study, big companies mostly hire STEM students and expect a good fluency in speaking. So,

it creates a huge pressure on the STEM subject learners to fulfil the company's expectations. Participants in my study also said that fluency is very important in terms of reporting and English medium background students easily get the priority here. Besides the good work, English speaking skill is also required to get a good position in work fields (Akbar, 2015).

So, from the above discussion it is quite evident that, despite doing good work in the office, many employees suffer for having poor communication skills in English. Sometimes, it impacts on their promotion, bonuses as well. It does not matter to the authority who comes from which background, in this competitive job sector, English is highly appreciated and valued the most (Ansari, 2004). Those who suffer from poor speaking proficiency, they more or less get overshadowed by the people who have good communication skills in English language (Khansir, Dehkordi and Mirzaei, 2021). So, good proficiency in English is valued everywhere.

Conflict in STEM Teacher's Mindset and Lack of Training

Though English has an impact in every field including STEM, many people in our country are quite unaware of this and majority of them think that, for engineering or other STEM fields, English speaking is not important, only having a good technical skill can lead them a long way. Participant Anushka mentioned that not all the STEM teachers think the same but some of them actually believe that English is not needed for STEM graduates. It is true that, in these fields, skill is needed but we have to agree that, without a good English speaking proficiency, an employee can stay behind in front of a colleague who has good English speaking and communication skill. Also, if STEM teachers think in such a way, students also get impacted by this which can create difficulties for them in their work life (Khajavi and Abdolrezapour, 2023). Some of the participants (teacher) in my study said that they use Bangla to teach the students to make them understand the topic properly which is a kind of wrong way of teaching (Javed, Mohamed and Sam, 2013) as it impacts in the long

term. They can use Bangla for better understanding but besides this, they can teach in English as well so that students can get familiar with the English terms as well.

In my study, some of the teachers admitted that they did not receive any basic training before starting teaching. According to Gill, Stewart, Treasure and Chadwick (2008), it is quite bad practice that STEM teachers always teach in their mother tongue and do not use English to teach their students. For these reasons, students sometimes lack basic knowledge about some of the common terms. A participant also said that, though he is very good at math but as he is preparing for his GRE exam, he noticed it takes some time for him to understand the questions properly. As he is not used to listening to STEM classes in proper English language, it took him a little time to come up with the GRE classes at the initial stage. Also he even faced difficulties to understand the English terms of the STEM subjects as well.

So, I can say that, because of the lack of instruction in the English language, many teachers feel that it is okay to teach the STEM students in Bangla all the time but students sometimes get affected by it. It is true that not all the students will face the same amount of difficulty but a percentage of students who liked to do higher education or to do a multinational job can get affected by that. Ansari (2004) has also talked about basic teachers' training and ways of using English in STEM classes in his article so this needs to be highlighted properly for the betterment of the STEM students in our country. Besides teaching in the mother tongue, STEM teachers can also use English language sometimes so that the students can get familiar with some of the basic terms.

Major Challenges in English Speaking

In my study, all the participants are from Bangla medium background and their English learning basics are not that strong from the beginning of their educational life. Also, they face less exposure in their university life so the majority of the participants' speaking

proficiency is quite poor. According to the Damayanti and Listyani (2020), the majority of the students face grammatical problems, limited vocabulary, anxiety, shyness, stammering, lack of fluency and poor pronunciation related problems. These are some of the common problems which are more or less faced by all my participants who take part in my research. Basically, STEM students are used to learning everything in Bangla and the English learning environment was not favourable for them. They also faced a lot of criticism for making any kind of mistakes in English language in front of everybody which demotivates them to speak in English. Negative feedback affects students the most and maximum of them lose their interest in English speaking (Dannels, 2002). In this case, teachers and fellow-mates need to be considerate in this matter. If a STEM student is encouraged by their fellow-mates, he or she can surely do well in English speaking. But unfortunately, this is not practiced well in Bangladesh and for this reason students are not used to speaking and listening to the English language or I can say they are not that aware of the advantages of using English language.

Ways that Help to Overcome Speaking Challenges

The participants in my study stated, to improve their English speaking, they have taken some necessary steps to overcome the difficulties that they face because of having poor English language proficiency. Majority of the STEM graduates said that they are using various E-learning platforms to improve their English language skills to apply in their real-life situations as well. Moreover, one of my participants also said that she has made a foreign friend and in her free time, she talks with him very often. She added that it is the most effective way so far in her opinion as it really helps her to improve speaking skill. However, other participants also talked about joining a language institute for practising English, watching English movies and series as well. One of them also mentioned about practising in front of the mirror so that they can increase their confidence in public speaking and can gain control over the expressions. It is obviously a good idea and can be very effective for a non-

native English speaker. According to Afrin (2016), STEM faculties can engage their students in presentation and other activities to improve their speaking skill and the faculties who participated in my research also talked about the same as well. One of them stated that, though she takes data related courses, she always manages to give at least one presentation in her course along with some of the group discussions so that students can interact with each other in English. She also makes sure that all the students are interacting in English not in Bangla so that they can practise English speaking a little bit. This is definitely a good initiative to engage the students in English speaking.

So, the chapter mainly summarized the overall discussed issues which my paper intends to find out throughout the research. It is expected that my paper will bring a positive outcome in the minds of the readers and would help STEM students, teachers and the administrators to give more focus on the English-speaking skill in order to keep ourselves ahead in every sphere of life.

Chapter 6: Conclusion

In this chapter I summarize the major findings of my research and present my recommendations. The main purpose of my research is to find out the difficulties STEM students face while speaking in English and the ways they try to overcome it. My study also highlights both students' and teacher's perspective on this topic and their views on it.

My research explores the speaking difficulties of STEM students from various universities in Bangladesh. In my study, a total of eight participants (including teachers and students) were interviewed to know about their perspectives and they were asked about their thoughts and experience of English-speaking in their academic and professional life and how it affected them in their day-to-day life. If I talk about the responses, the majority of the participants agreed that they have faced some sort of difficulties in their life because of their poor English-speaking skills as maximum jobs or any institution prefer employees who can speak in English. Also, people who can have a good fluency over English speaking, they always get prioritized over them. Surprisingly, some teachers believe that English speaking is less essential for the STEM students as skill is more required for them. Though this point has some sort of logic but unfortunately in this era, English speaking is needed everywhere. So, it is not true at all. However, this type of conflict in thought creates misconceptions among the students and for the most of them remain unaware of the importance of English speaking in their professional life. Moreover, the reasons for having this type of speaking difficulties have also been discussed throughout my study. Besides these, my research also highlights some of the effective ways to deal with the speaking difficulties of the STEM students. It is a good idea to practice in front of the mirror or to use various digital platforms for practicing English speaking but regularity is a must. With regular practice, STEM students can develop their skill in English-speaking. Along with these, my study also focuses on the different perspectives of students and teachers on the importance of English for STEM students.

Though their perspective varies a little, this cannot be denied that English speaking is the most essential skill for the STEM students and all of them agreed to that. So, my research thoroughly discusses the importance by covering all the research questions and tries to find out the answers. It can be said that my research will be helpful for the readers especially the STEM readers to spread awareness of learning English-speaking so that the students can practise this beside their academic studies and prepare themselves for the near future.

Recommendations

Based on my study findings, I would like to make the following recommendations to help support the improvement of English speaking skills among STEM students:

- English speaking skill has to be promoted from the beginning of the student life in all educational institutions.
- English speaking skills must be emphasized more for the STEM students from the beginning of their university education so that they can be aware of the importance of English-speaking skills and can take necessary steps to achieve proficiency in English speaking.
- STEM teachers need to give instruction in the English language instead of using Bangla in their classes. This will encourage the students to speak in English at least in the classroom. Also, some presentations and group discussions need to be encouraged to create English speaking opportunities for students.
- English training for the STEM teachers is very important so educational administrations should keep this in consideration and take necessary steps.
- STEM students need to prepare themselves to invest some time in increasing their proficiency in English by reading books, watching movies, reading newspaper articles etc. along with their studies.

- Some seminars, workshops and other professional support should be provided by the university to help support the improvement of English speaking skill among STEM students. Language labs can be founded as well.

Limitations of the Study

My study has several limitations. Firstly, there are eight participants in my research (five students and three teachers) who all are from Bangla medium background and studied in the STEM subjects. My research does not include any participants from an English medium background to discuss their speaking challenges after studying in the STEM subjects. Moreover, the teachers who have participated in my research, all are now teaching in different private universities. Though two of them graduated from public universities, they have experience of teaching in private universities only. So, my research does not include any teachers who are currently teaching STEM subjects in public universities to share their views. Also, my research could not test or assess any of the participants' English-speaking proficiency. It is fully based on what they shared about their experiences and views of English-speaking difficulties and the experience and thoughts may vary with time.

Scope for Future Research

The importance of studying the STEM subjects is increasing day by day, speaking in English is quite needed for people of all backgrounds. If a person faces difficulties in speaking in English, he or she might suffer in different stages in their professional life. There are a number of studies available on the importance of English speaking but none of them especially focuses on the STEM students of Bangladesh. So, I tried to fill the gap by doing my research. My study basically emphasizes Bangla medium STEM students but, in the future, one can conduct similar studies on STEM students from English medium educational institutions in Bangladesh.

Concluding Thoughts

In my paper, I investigated Bangladeshi STEM students' English-speaking difficulties and the reasons behind it. It also included English speaking practices in Bangladeshi educational institutions and the challenges students face from the beginning of their student life. Moreover, the teacher's perception of the English-speaking skill of the STEM graduates is also highlighted in my research. I believe that my findings will be able to help the current students reading in STEM subjects to know about the obstacles which they can face because of their lack of English-speaking skill. Besides this, my research also highlighted some of the ways of improving English speaking skill as well. So, my research will be beneficial to its readers for knowing about the English-speaking difficulties of STEM students along with the ways of overcoming it.

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Appendices

Appendix A: Consent Form

A Qualitative Study on the Challenges Faced by Bangladeshi STEM Graduates in Speaking in English

Principal Investigator: Rubyat Tahrim Rafa

Master's student, English Linguistics and ELT

Thesis Supervisor: Dr. Syeda Farzana Sultana

This form describes a research study that is being conducted by Rubyat Tahrim Rafa from
BRAC University

Hello, I am Rubyat Tahrim Rafa, a M.A student from Brac University conducting research on “A qualitative study on Bangladeshi STEM graduates’ English-speaking difficulties.” The purpose of my research is to understand the speaking challenges of Bangladeshi STEM graduates and the causes behind those challenges. You are invited to attend an interview session with me on ZOOM or over mobile phone to talk about the challenges you are facing right now in English speaking. This interview and the discussion will be recorded and will only be used to fulfil the purpose of my study. If you face any discomfort in showing your face, you can put your camera off while giving the interview. This information, ideas, opinions you share will not be disclosed to anyone, and I will use pseudonyms for keeping your identity confidential.

If you are ready to be a part of this study, I will send you the questions beforehand so that you can go through it. If you agree to be a part of my study, please read the details thoroughly and give your approval by signing on the consent paper. Your kind cooperation in conducting my research will be highly appreciated. Please read the details thoroughly and

give your approval by signing on the consent paper. Your kind cooperation in conducting my study will be highly appreciated.

Sincerely yours,

Rubyat Tahrim Rafa

Department of English and Humanities, BRAC University

Phone No. 0133xxxxxxx

Email: rubyat.tahrim.rafa@bracu.ac.bd

Research Participation Consent Form

Please read the following statements thoroughly and put your signature on the signature section, if you are ready to be a part of this interview.

1. I have read all the descriptions and understood what my study is about and the data collection procedure.
2. My participation is voluntary and I feel free to withdraw at any time.
3. I give my consent for video or audio recording for my voice and face.
4. The researcher has my permission to contact me through the following phone number or email address for any clarification after the completion of data collection.

.....

Name

.....

Signature

Date:

Phone no:

Email:

Appendix B: Interview Questions for the Students

1. Please tell me about yourself – your name, age, educational background, year of study etc.
2. Are there any English language courses offered by your university? Tell me about the course.
3. What kind of language learning facilities do you have in your institution (language lab, ample books, and resources for listening practice)?
4. Among the 4 skills in English, in which one do you find the most challenging and why?
5. What kind of speaking proficiency do you have? What strategies do you use in learning to speak English? How do you practice speaking English?
6. What kind of challenges do you face when speaking English?
7. What is the medium of instruction for your STEM classes? How do your classmates respond to it?
8. How often do you use English in conversation with others? Where do you speak in English mostly?
9. Do you think the English curriculum in your institution provides any support for learning English?
10. What type of feedback do you receive from your peers or faculty members when you make mistakes in speaking in English?
11. What kind of additional support do you think will help you learn English better?
12. Are you working now? How long have you been working? Please tell me about your work and what kind of English skills you need there.
13. Do you think proficiency in the English language creates any impact in the job sector in your field?

14. What kind of challenges do you face, or do you anticipate facing because of poor English-speaking proficiency?
15. Do you feel anxious while talking in English with your fellow colleagues? How do you try to overcome it?
16. Does your English language proficiency create any impacts on your employment, benefits, promotion etc
17. What is your overall perception of English-speaking skills and its benefits?
18. What steps have you personally taken to improve your English?

Appendix C: Interview Questions for the Teachers

1. Please tell me about yourself – your name, age, educational background, teaching experience, etc.
2. What kind of teacher training did you receive before and after you started to teach?
3. Which courses do you teach in your university?
4. Does your university offer any English language courses for the STEM students?
5. Which medium of instruction do you mainly follow to teach the STEM courses and why?
6. What kind of challenges do your students face due to using English for teaching STEM subjects?
7. What kind of challenges do you think your students might be facing in their professional career because of having poor speaking skill?
8. What is your opinion regarding the use of English or native language to teach STEM subjects to the students? Do you think the English medium instruction will increase their proficiency?
9. How should we teach speaking to our STEM students to help them become proficient? What type of activities and practice opportunities should be created for the STEM students to keep them motivated to learn and use English?