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Mainstreaming Slow-Pace Learners Through Mobile Assisted Language Learning: A Case of Bengali Primary Level Students with Dyslexia

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ABSTRACT

Every child has the right of taking education. The rights of having education of the children who have learning disabilities come forward in recent decades. The main aim of this thesis was to explore how Mobile assisted language learning tools can help the dyslexic children in mainstreaming education. Towards attaining the broad objectives, the study has also focused on some relevant objectives such as, to assist students with dyslexia in mainstreaming by focusing on phonological, morphological, and syntactical awareness, introducing dyslexic students to a multi-sensory learning system, to propose a focused device to assist dyslexic students in dealing with phoneme-grapheme harmonization, which are crucial in reading, to identify the perceptions about dyslexia among parents and teachers. Qualitative study was applied for this study where five dyslexic students were played main role as sample. Moreover, four teachers and five parents have also a role of assisting sample. The study was conducted from a Government Primary School in Dhaka, Bangladesh. The study showed that children having dyslexia have more difficulties in reading the voiced sounds, multisyllabic words, rhyming sentences. Furthermore, they have problems of sentence repetition, naming and timing knowledge. The study also demonstrated that parents and teachers play very negative role with these children that causes them to demotivate in terms of going school regularly. The major findings of the study showed that mobile assisted language learning tools help these dyslexic students to develop their skills in a tremendous way. The main reason is that they can hear a sound or word as many times possible as they want compared to the classroom where they have not the opportunity to ask several times. After using the tools, they felt more motivated and encouraged and most importantly they started enjoying their learning. Though government and many organizations have taken many activities to promote mainstreaming education, the opportunity of mainstreaming the dyslexic students is yet to develop.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

According to a study published in the International Journal of Advanced Research (2015), Volume 3, Issue 12, 1327-1331, a 9.02 percent prevalence rate of dyslexia in Dhaka primary schools. The National Institute of Child Health and Human Development (NICHD), 2000, proposed that in the United States, almost 17 to 20 percent of children have some developmental disability like dyslexia. The International Dyslexia Association confirmed in November 2015 that over 50% of NASA employees are dyslexic. They are deliberately sought after because of their excellent problem-solving skills and their 3D and spatial consciousness. This statistic was also published by the Canadian Dyslexic Centre in the book of "Dyslexia

and The Workplace", written by Louise Brazeau-Ward. Though dyslexia is considered only a disability, males and females are affected equally, making it a universal labyrinth within approximately 20% of the population (International Dyslexia Association, 2008; Shaywitz,2003; 2003; Coordinated Campaign for Learning Disabilities, 2001; NICHD, 2000; Richard, 1999; Learning Disabilities Association of America, 1996; Richardson, 1994). This clearly shows that almost 1 in 5 children will have significant symptoms of dyslexia regardless of gender, including poor spelling, poor writing and slow and inaccurate reading (International Dyslexia Association, 2008). People are not aware and they have many misconceptions about dyslexia, even among educators (Wadlington,2005). Another data shows that, almost 44% of students are affected by learning disability among the special education students.

1.2 Objectives of the Study

The objectives of this study will include the following:

1. To assist students with dyslexia in mainstreaming by focusing on phonological, morphological, and syntactical awareness.
2. Introducing dyslexic students to a multi-sensory learning system
3. To propose a focused device to assist dyslexic students in dealing with phoneme-grapheme harmonization, which are crucial in reading.
4. To identify the perceptions about dyslexia among parents and teachers.

1.3 Statement of the problem

According to Bangladesh Bureau of Statistics, 57% of children in Bangladesh whose age is between 7 and 14 are not proficient at reading, where 98% is suggested by UNESCO. Among them, 65% of students in class three can not read Bangla fluently and 75% of class five students do not have minimum competency in mathematics (BBS, Multiple Indicator Cluster Survey). There is no previous clinical research which concerns mainstreaming dyslexic students in Bangladesh. The main reason is the lack of information and awareness about this impairment. As we know, education has a significant impact on a student's life, but the children affected by dyslexia may hinder their development, and as a consequence, the ultimate result will be their exclusion from society (EDA, 2013).

However, much less research has been conducted in the emerging field of mobile learning (M-Learning), despite the fact that the use and adaptability of mobile phones has increased dramatically. Peter Mulligan, a disability advisor at Sunderland College, advises for Mobile Assisted Language Learning to make learning easier and more pleasant for dyslexic learners.

1.4 Rationale of the study

In this thesis, there are two major concerns. The first one is why the term "dyslexia" is taken as a sample of slow-paced learners. The second reason is that mobile assisted language learning can be used to mainstream them. According to the Society for Neuroscience, 2004 " Brain Research Success Stories " a staggering 15% of the world's population may have dyslexia whereas 1 in 100 children has autism (WHO). Since dyslexia is not a physical disability but more of a learning impairment, it is not visible to us but its rate is increasing at an alarming rate.

Though this impairment varies from person to person, some common symptoms among people are difficulties with phonological processing, spelling, and rapid visual-verbal responding. The use of ICT is growing in every sector of education. Research is now focusing on the potential benefits of using Information and Communication Technology (ICT) so that an optimistic learning environment can be developed. It also helps to motivate and help children. M. Thomas considered ICT as an enabler since it

can facilitate students by learning, improving their motivation, fostering self-competition, increasing their confidence and self-esteem.

1.5 Definition of the key term

1.5.1 Mainstream education

Mainstreaming education is considered as the most ordinary pathway to address the educational needs for all children (Ainscow & Miles, 2008; Miles & Singal,2010; Mitchell, 2009; Pathy,2010; Ruijs, Van Der Veen & Peetsma,2010). It is the way to make sure a normal environment of the children with different impairment. All the children born with an inner ability proposed by Noam Chomsky. So, all children whether they are typical or atypical have rights to get education. Mainstreaming means that the atypical or the students who have language impairment need to attend the normal school program to the age appropriate classes of schooling (Idol, 2006). According to UNESCO (2005), mainstreaming is accepted as a widely phenomenon.

1.5.2 Children

Human beings whose age is under 18 will be considered as children (The United Nations Convention on the Right of the Children & The Provisions of Children Act, 2013).

1.5.3 Slow pace learners

Slow pace learners are those who are not coping with the work generally expected at their age group (Bun,1997). According to Kirman (1975), the learners whose scholastic performance is below than the average expected of their age peers.

1.5.4 Dyslexia

The word dyslexia come from the Greek words - " dys" (impaired) and " lexis" (word). Dyslexia is defined as a neuro biological disorder that affects the development of both encoding; spelling and decoding; written word pronunciation (Vellutino & Fletcher, 2007).

Dyslexia does not mean all kinds of reading problems (Gough and Tunmer,1986). There is a model designed by Gough and Tunmer called SVR (Simple View of Reading). According to this model RC (Reading Comprehension) = D (Decoding)× LC (Language Comprehension). This model suggests that those who are considered as dyslexic can understand text when it is read aloud but have problem of reading words.

1.5.5 Mobile Assisted Language Learning

Mobile assisted language learning is the practice of learning a language while using a portable electronic device (Palalas and Ally, 2016:1). The essential features of mobile assisted language learning are "accessibility, permanency, interactivity, and positioning of instructional tasks are neatly summed and introduced," according to Metcalf and David (2006:31). Cell phones, personal digital assistants (PDAs), smartphones, tablets, and pods are all categorized as portable devices in this realistic environment, however laptops are not included despite having similar characteristics.

1.5.6 M-Learning

M-learning is considered as a learning model that utilizes information and technology communication that will help to provide materials with visualization of interesting materials that can be accessed in anytime related to teaching (Brown,2008:5).

1.6 Challenges of Mobile Assisted Language Learning (MALL)

The benefits and drawbacks of learning based on M-Learning, which is more prevalently employed in community settings, depend on how directly or indirectly it is used in each learning process (Son,

2016:161). There are few challenges of using Mobile Assisted Language Learning for the children with having learning impairment.

1. 1.There may be tendency to play games while using mobile device. So, need to choose those applications or tools those will make them learn but feel them like they are playing games.
2. Small screen of Mobile sometimes make them feeling bored.

1.7 Construction of the dissertation

The report is constructed into seven chapters and each chapter contains sections and sub sections. The first chapter deals with the Background of the study, Objectives of the study, Statement of the Problem, Rationale of the Study, Definition of the Key Terms which includes mainstreaming education, children, slow pace learners, dyslexia, mobile assisted language learning and M-learning, Challenges of Mobile Assisted Language Learning (MALL) and Construction of the dissertation.

The second chapter focuses on review of related literature on mainstreaming education through Mobile Assisted Language Learning of the children with dyslexia. Research findings, Articles, Books, PhD reports, journals those are related to this study are also reviewed in this section.

The chapter three outlines theoretical parts includes Mainstreaming education, Dyslexia and Mobile assisted language learning . The first section of mainstreaming education is constructed with introduction of Mainstreaming education, Origin of mainstreaming education, Mainstreaming education in Bangladesh, Global scenario of mainstreaming education and Conclusion. On the other hand, the second section which is dyslexia is made of Introduction, Children with dyslexia, Present situation of dyslexia in Bangladesh, Global scenario of dyslexia, Reasons behind dyslexia, Characteristics of dyslexia, Learning differences connected to dyslexia and conclusion. Another section learning differences connected to dyslexia is arranged with four subordinate sections namely Dysgraphia, Dyspraxia, Dysorthographia and Dyscalculia. This chapter demonstrates with Mobile Assisted Language Learning with Mobile learning, Advantages of MALL in dyslexia education and Limitations of MALL.

The chapter four deals with the methodological part. This part includes introduction, research methodology, qualitative approach, research questions, research design, area of the study, sampling, sources and techniques of data collection, recruiting of participants and finally reflects on the validity, reliability; generalize ability and ethical consideration of the study and using mobile applications for mainstreaming dyslexic children.

The chapter five demonstrates the analysis of data.

The chapter six presents the findings and discussion section of data.

The last chapter demonstrates the conclusion section.

CHAPTER TWO: REVIEW OF LITERATURE

2.1 Introduction

This chapter will review literature regarding the jurisdiction and areas with specific relation to dyslexia and mainstreaming education through Mobile Assisted Language Learning. It reviews several works done so far on dyslexia, mainstreaming atypical children and Mobile Assisted Language Learning in the context of dyslexia.

2.2 Literature review

The most common sources for a literature review can include:

a. articles,

b. abstracts,
c. books,
d. reviews,
e. documents,
f. journals,
g. monographs,
h. dissertations,
i. research reports,
j. print and electronic media,
k. video documentary

The main objective of literature review is to remark the current study related to the topic and to provide context for the particular reader. Anyway, a short review of literature has been done related to Mainstreaming Slow-Pace Learners through Mobile Assisted Language Learning: A case of Bengali Primary Level Students with Dyslexia. These reviews will definitely show various perspectives to the researcher to understand the concept well.

Easy Lexia: A Mobile Application for Children with Learning Difficulties; Sunderland College: Using Mobile Phones for Dyslexic Learners

The goal of P. Mulligan's study in 2012 and Roxani Skiada Eva Soroniati, Anna Gardeli, and Dimitrios Zissis's study, "EasyLexia: A Mobile Application for Children with Learning Difficulties" from 2013, was to create a mobile application that could improve learning and help students with basic skills like reading comprehension, orthographic coding, short-term memory, and mathematical problem-solving. They made an effort to create a vibrant setting that may inspire kids with learning challenges.

Their main goal was to examine the usability of mobile applications (technology), how it influences the learning process, and what the implications and advantages will be. They discuss their methodology, environment setup, design choices, implementation, and the results of the initial evaluation and assessment of "EasyLexia," a mobile app for kids with learning disabilities. In conclusion, their main finding demonstrates the positive potential of mobile learning by demonstrating how quickly students' overall learning performance tends to improve. After carefully weighing the pros and cons, they have decided to broaden the range of supported devices and will give tablet integration more thought.

Prevalence of Dyslexia in Primary School in Dhaka: Its Effects on Children's Academic and Social Life

A cross-sectional study by Muzahid Ali and A.S.M. Sarwar (2015) sought to ascertain the prevalence of dyslexia among primary school pupils in the Mohammadpur region of Dhaka, Bangladesh, who were in the fourth grade. The sample of 133 students, aged between 10 and 12 in the 4th grade at three primary schools, consisted of 54 boys and 57 girls. To rule out dyslexia, the pupils' academic records, Raven's Progressive Metrices (Raven, Court & Raven, 1977), and the Bangor Dyslexia Test (Miles, 1997) were employed. Statistics that are descriptive and nonparametric were used to calculate the prevalence of dyslexia. 9.02% of the sample as a whole had dyslexia, according to the diagnosis. In the population under study, dyslexia was more common than average. Differences in gender were not significant. Dyslexic students fall far behind their peers academically. The cognitive development of children and academic failure present a conundrum. It was discovered that teachers and family members had unfavorable attitudes toward dyslexic children, which showed themselves as taunts, exclusion, psychological pressure, and

physical aggression. Based on their knowledge and educational background, many misconceptions were also discovered in their study.

Essentials of Dyslexia: Assessment and Intervention

The book by Dr. Nancy Mather and Barbara J. Wendling (2012) is intended for assessment experts, educators, and parents who are interested in comprehending, evaluating, and assisting people with dyslexia. The requirements of recent educational changes are satisfied by this new Essentials book. The main focus is on dyslexia, the most prevalent type of learning disorder, rather than on the use and interpretation of testing tools. One must first comprehend the nature of the disability in order to diagnose it.

Multiple Elements as Instructions for Dyslexic Children

This paper by R.S. Fadilahwati Abdul Rahman, Fattawi Mokhtar, and Nor Aziah Alias (2012), which is based on their study "Multiple Elements as Instructions for Dyslexic Children," discusses how multimedia elements are implemented as instructions on IMLO (Interactive Multimedia Learning Object). For dyslexic children in Malaysia, this type of multimedia program regarding "multiplication of two" contents was created. The major goal of this study was to clarify the roles that multimedia components play in IMLO's learning and during exercise activities. The methodology used for this thesis was qualitative, with the ARCS model being used to understand the multimedia components, and the results being assessed by professionals. This discovery was crucial for the development of the IMLO approach as well as for other researchers who would receive helpful guidance for the creation of comparable multimedia training for dyslexic children. According to Keller & Suzuki(1998), " humor can break up monotony and maintain the interest by lightening the subject." They find out that specific images, graphics, screen design, and story-based content with specific cartoon characters might help the children with dyslexia.

Dyslexia & Information and Communication Technology: A Guide for Teachers and Parents

Dyslexic students can access the core curriculum if ICT is used properly, according to Anita Keates' 2002 book "Dyslexia & Information and Communication Technology: A Guide for Teachers and Parents," however the primary issue is using ICT effectively. The author, an independent ICT consultant who also serves as the committee head for the British Dyslexia Association, has organized a wealth of tips and techniques based on his significant teaching experience. This book has also included updates to help the user navigate the confusing array of gear and software that is currently on the market and determine which ones are appropriate for various Stages and curricula. Additionally, it offers ICT answers to the issues with testing and screening kids for dyslexia.

Using ICT with people with special education needs: what literature tells us

In the study, "Using ICT with people with special education needs: what literature tells us," P. Williams, H.R. Jamali, and D. Nicholas (2006). This study's main objective was to offer an overview of earlier research on ICT for students with special education needs (SEN). Information on the visual advantages of ICT in special education needs and the use of some specific mobile applications with people having various impairments was gathered for this study. There are many usability studies, particularly for online and internet technologies. Although there have been a number of ICT projects for those with special education needs, the author said that there has been a startling lack of research into the major usability of the many programs created for those with learning disabilities. The main conclusion of this study is that, in comparison to those who are visually impaired, special education needs students receive less attention while applying ICT.

Phonological Awareness Software for Dyslexic Children

T.A. Kazakou, M.Soulis, S.Morfidi, & E. Mikropoulos's study on "Phonological Awareness Software for Dyslexic Children, 2011" in this paper is presented with the "Phonological Awareness Software for Dyslexic Children"(PHAES) which is considered as a hypermedia application for assisting the children with dyslexia by providing the training of Phonological Awarenes. The software (PHAES) uses the smallest units of language (phoneme/grapheme) presented alone along with the morpheme and syntactic level in not only written but also spoken format. The ultimate result was that the software (PHAES) is a user friendly educational application and It has the potentiality in order to set an example for the upcoming thesis in this sector.

Mobile Application Development on Detection and Diagnose of Learning Disability for Children

The study by G.Rajivsureshkumar, K. Malarvizhi, and G. Deebanchakkarawarthi (2019) demonstrates the intention to create a mobile application for children with dyscalculia in Malaysia in the year of 2017. It creates computer models for memory and attention. This application's main function is to improve the brain function of kids who have learning disabilities. The study's findings showed that this mobile application is helping the community of kids with learning disabilities by digitalizing clinical techniques.

MathFun: A Mobile App For Dyscalculia Children

R. B. Rohizan & S. A. Mubin wrote an articleon "MathFun: A Mobile App For Dyscalculia Children(2020)". In this study said that Dyscalculia is one of the major learning disabilities in which children has shown lack of inability of studying math. By the grace of Technologies, Varieties applications can be created for helping the learning process of children having learning difficulties. This research was aiming at focusing on the findings from the result of the MathFun app on it's effectiveness towards increasing the learning process for the children who have learning impairments. Three children and three teachers were involved in this research where descriptive analyses was performed for analysing. The outcome shows that MathFun app was able to assist the children having learning impairment and also has the potentiality to be use in the classrooms.

Learner Needs Analysis for Mobile Learning Comic Application among Dyslexic Children

The study "Learner Needs Analysis for Mobile Learning Comic Application among Dyslexic Children (2012)" by R. Saleh and N.A. Alias aims to implement mobile applications on processes of children with (SLD-Specific Learning Disability). Researchers unanimously agreed that ICT can aid in these children's language development who have e among educators, the usage of mobile applications for the English language is generally acknowledged and found that the majority of the applications hardly ever use the Malay language as the main stream to support these kids' Malay language development. As a result, it was imperative to establish the goal of this work as the introduction of an interactive mobile application that uses Malay as a therapy tool for cha in order to enhance their linguistic acquisition processes. The application is user-friendly and uses multi-sensory strategies that are appropriate for language problem learners, particularly dyslexic children.

Schools for Thought: A Science of Learning in the Classroom

The main goal of "A Science of Learning in the Classroom," a publication by J.T. Bruer for Schools for Thought in 1994, is to help children who need better learning skills by utilizing science. Before we base classroom practice on what research suggests about teaching and learning, improving our schools is not even a possibility. John Bruer's work makes the results of cognitive research understandable and shows how their implementation in the classroom may genuinely benefit kids, including those from poor circumstances, in terms of improving their learning abilities. These novel concepts have won numerous

accolades and received a resounding endorsement from educators across the country. The head of the James S. McDonnell Foundation is John T. Bruer.

Dyslexia and the Brain: Research shows that Reading Ability Can be Improved

"Dyslexia and the Brain: Research Shows That Reading Ability Can Be Improved" is a fantastic piece of work by E. Temple from 2008. The purpose of this study is to provide parents, teachers, and other caregivers of children with developmental dyslexia a positive viewpoint. In reality, this research demonstrates that it is possible to examine how instruction affects dyslexic children's brains. The functional magnetic resonance imaging (fMRI) method has been used in studies on the brains of adults, but the researcher has effectively modified the method for use with young children. The third one is a specific rehabilitation program called Fast ForWord Language, which helped dyslexic children read better while also altering how their brains functioned. Future research that examines various therapies and instructional approaches may be enabled by this discovery. The last discovery is that dyslexia-related brain dysfunction can be improved.

"Persistence of Dyslexics" Phonological Awarenes Deficits

Study on the "Persistence of Dyslexics" by M. Bruck (1992) Phonological Awarenes Deficits looks into the phonological awareness of dyslexic children, adults who were diagnosed with dyslexia as children, and readers who are regarded as good readers at different age levels. Although dyslexics eventually develop age-appropriate levels of onset-rhyme awareness, comparisons of the dyslexics to competent readers of the same age or reading level show that they do not acquire suitable levels of phoneme awareness. Even people with advanced word recognition abilities have problems with phoneme awareness. Age and reading ability were consistently correlated with gains in phoneme awareness in non-dyslexic readers, but not with dyslexics.

"The Effects of Dyslexia on Math Education", Math and Reading Help

This article was released in the year of 2013.According to this article, dyslexia is a learning condition that impairs people's ability to read and interpret written language. It has an impact on people's talents in math as well as other areas of their lives. According to studies, 60% of dyslexics experience dyscalculia, a trouble with math. Dyscalculia is a relatively uncommon disorder, and many people who have it are also dyslexic. Dyslexics who wish to enhance their mathematics abilities can benefit from several therapy. This article recommends private instruction as a solution. For all kids, but especially for those who struggle with learning, this approach is crucial. The professional tutoring is another suggested remedy. Many dyslexics find it to be a helpful resource as well. Online professional programs are now accessible. Online tutoring services are going to be considered professional programs.

Challenges, Methodologies, and Issues in the Usability Testing of Mobile Applications

A general framework for conducting usability tests for mobile applications is suggested by the study "Challenges, Methodologies, and Issues in the Usability Testing of Mobile Applications" by D. Zhang and Boonlit Adipat. The study discusses research questions, methodologies, and usability attributes. It offers a general structure and comprehensive instructions on how to carry out these usability tests. Effective usability testing is becoming increasingly crucial for the design, development, and deployment of successful mobile applications given the rapid advancements in mobile technology and applications. Traditional standards and methodologies used in usability testing of desktop apps may not be immediately relevant to mobile applications due to specific features of mobile devices, restricted bandwidth, unreliability of wireless networks, as well as other shifting mobile circumstances. To assess the usability of mobile applications, it is crucial to create and apply the right research approaches and technologies.

Mainstreaming Education of the Children with Disability in Bangladesh

The author of this dissertation is M. Islam (2019). The purpose of this study was to illustrate the current state of Bangladesh's mainstreaming of education for children with disabilities. The study has also concentrated on a few pertinent goals, such as:

1. Understanding the sociodemographic profile of children with disabilities.
2. To learn about the resources and issues related to including disabled children in mainstream education.
3. To be aware of disabled children's dropout propensities.
4. To create the suggestions and
5. To resolve issues with including disabled children in mainstream education.

This study used a qualitative research methodology and purposive sampling to identify five primary school instructors and five parents of children with disabilities who attend mainstream schools.

The study's conclusions indicated that, while the education system is increasingly improving, insufficient resources are being allocated to it. The study also revealed that parents quit enrolling their children in school due to a lack of qualified teachers, transportation issues, and increased costs for children with impairments. The survey also showed that although some people strongly encourage students with impairments in continuing their education, most classmates, peers, and members of society behave crudely toward them to some extent.

The study also found that parents of children with intellectual disabilities who struggle academically are less likely to enroll them in mainstream schools. Additionally, this system helps disabled youngsters develop their social skills.

The main conclusions of the study demonstrated that the school lacks the necessary infrastructure, teaching aids, assistive devices, and instructional materials to suit the needs of the students with disabilities. Even though there are numerous government and non-government initiatives to support the mainstreaming education system, the instream has not yet matured.

Identifying, assessing, and treating dyslexia at school. New York, NY: Springer

This book was written by Christo, C., Davis, J., and Brock, S. E. (2009) to aid educators in comprehending the causes of dyslexia, the most prevalent learning disability. The focus is on assisting practitioners in delivering early, effective assessment and intervention. The writers outline the duties of school staff members and provide evidence-based findings on evaluation and effective solutions.

History of Mainstreaming Education of the Children with Disabilities

The 1960s saw the beginning of the journey toward mainstreaming schooling for children with impairments (Foreman, 2008). Among all the declarations and conferences, the World Declaration on Education for All (EFA), which was held in Jomtien, Thailand (1990), had the goal of ensuring that all children, youth, and adults have access to education. The World Education Forum meeting in Dakar in April 2000, which was conducted to assess the development of IE (Inclusive Education), also highlights the importance of providing education to everyone as a fundamental right regardless of personal differences (UNESCO, 2009). The major objective of education is to build social cohesion, hence inclusive schools turn their "pedagogical ideas into means of integrating the diversity of pupils" instead of isolating special needs students in separate classes (UNESCO, 2009).

Attitudes, Implementation, Reason of Drop Out, Problems, Barrier and Challenges of Mainstreaming Education of the Children with Disability

The purpose of Gail Ferguson's 2014 study, "Including Children with Disabilities in with Mainstream Education Primary: An Exploration School Teachers of the Challenges and Considerations for Parents

and," was to illustrate the topic of inclusion in education from the viewpoints of primary school teachers and parents of children with intellectual disabilities. The major goal of this research was to ascertain whether or not it was actually common practice to include children with impairments in mainstream settings. For the goal of this study, a phenomenological technique was used since the researcher intended to get a personal understanding of the participants' lived experiences. The researcher conducted focused group and one-on-one interviews with a sample of primary school instructors and parents of children with intellectual disabilities who are currently enrolled in mainstream schools. The viewpoints and experiences of teachers provide accurate information, while the perspectives and experiences of parents of children with disabilities provide important insights into the reality of the educational system from the standpoint of children's access to necessary resources.

The main findings demonstrated that, although inclusive education is advantageous for both children with and without disabilities, particularly in terms of social development, opportunities for genuine inclusion of children with intellectual disabilities are frequently jeopardized by difficulties and barriers present within the educational system.

Dyslexia and Learning English as a foreign language: the Phonological/orthographic teaching through the multisensory method

The study "Dyslexia and Learning English as a Foreign Language: The Phonological/Orthographic Teaching through the Multisensory Method" by S.D. Libera (2014) looks into possible activities that could be used in a classroom setting. This study's findings suggest that studies may benefit children who have language issues if a direct multimodal approach is used. According to the study's conclusion, utilizing a multimodal approach that encourages phonological awareness, orthographic awareness, and letter-sound correspondence can be a valuable supplement to the standard scholastic instruction.

Learning to read words: Theory, findings and issues.

L.C. Ehri (2005), " Learning to read words: Theory, findings and issues" is the study aiming at finding theory that will help learners to read words. This research also suggest to use multisensory method that will help to learn words. It also finds that when readers read familiar words by accessing them in their memory, all words then come to their sight automatically after practice. The multisensory method helps them this decoding process.

An Evaluation on Mainstreaming Practices of Primary Schools According to the Views of School Admin instrators, Teachers, and Parents comparison the views of admins

The paper "An Evaluation on Mainstreaming Practices of Primary Schools" by Gökmen Dala and Behçet Znacarb According to the comparison between the viewpoints of school administrators, teachers, and parents published in 2015, the goal of this study was to look into how parents, teachers, and instructors impacted the implementation of mainstreaming education in primary schools. "This study found that the requirements for mainstreaming are not sufficient nor did there is enough information, that normal class teachers are insufficient in their knowledge, that families cannot accept their child's situation, that there is little participation in class, that classes are disorderly, and that there is also a problem with "normal" children in their approach to children with special needs," the researcher stated.

Dyslexia: Theory & practice of instruction (3rd ed.). Austin, TX: PRO-ED

The book by Uhry, J.K., and Clark, D.B. (2005) offers comprehensive descriptions of numerous reading programs created for the treatment of dyslexia in addition to a clear explanation of the disorder. There are three parts to it: The first section discusses the psychological and cognitive mechanisms that underlie reading, the second section outlines the fundamental teaching strategies that are most effective with

struggling readers, and the third section discusses specialized reading programs for students who struggle with reading.

Inclusive Education for Children with Disabilities in Bangladesh: Implementation and Challenges

The goal of Shabnam Mehtab's study, "Inclusive Education for Children with Disabilities Implimentation and Challenges (2014)," was to determine how inclusive education may be implemented in our nation. Additionally, the difficulties that instructors experience in implementing inclusive education will be looked into. A written questionnaire was given to 30 respondents in order to conduct this survey successfully. A small number of regular students and teachers were also interviewed. The survey's results demonstrate that our nation's educators are successfully implementing inclusive education. Additionally, new teachers are dedicating their time to this system. Due to financial support, parental attitudes toward children with special needs, and teachers who have received the appropriate training, obstacles arise during implementation.

Inclusion of Students with Disabilities in Mainstream Primary Education of Bangladesh

In the 2011 study "Inclusion of Students with Bangladeshi Primary Education" by Das ASIM According to Disabilities in Mainstream, Bangladesh has made outstanding strides in basic education over time. With each passing year, more and more primary school kids with disabilities are being included in the regular curriculum. However, Bangladesh is still a long way from providing inclusive education that is of high quality for all students. A challenging supplementary arrangement is needed for inclusive education inside the established system. The current study examines the policies and legal framework in Bangladesh pertaining to inclusive education while reporting on the current state of the education of students with disabilities in general education settings. This essay makes further recommendations for programs and tactics that should be taken into account for Bangladesh's effective inclusion in elementary education.

Learning Strategies for Slow-Pace Learners Using the Project Based Learning Model in Primary School

Finding effective learning techniques for slow pace learners in elementary school is the goal of a study conducted by A. Hartini, D.Widyaningtyas, and M.I.Mashluhah (2017) titled "Learning Strategies for Slow-Pace Learners Using the Project Based Learning Model in Primary School." As a result of this study, slow learners might be encouraged to progress by employing tools like Mobile Assisted Language Learning (Peter Mulligan), with which they have firsthand experience.

Investigating the efficacy of the use of ICT for slow learners: Case studies in Singapore Primary Schools

The study "Investigating the efficacy of the use of ICT for slow learners: Case studies in Singapore Primary Schools" by C.M. Wettasinghe (2007) looks into the effects and modifications brought about by the integration of IBM's KidSmart program into the Learning Support Programme (LSP) in six Singapore primary schools. It focuses on how teachers who work with slow learners might use ICT to improve their teaching and learning approaches (or learners at risk). The main goal of this research is to find practical teaching methods or procedures that will help slow learners learn as much as possible while using ICT. The results showed that, in addition to the core curriculum, all of the teachers interviewed actively employed ICT with their students. Based on this, three key themes were found that offer guidance for teachers on how to use ICT to maximize learning gains for slow learners.

Learning Motivation for Slow Learners with Tablet Technology

In their 2018 study, "Learning Motivation for Slow Learners with Tablet Technology," H. Azizzeanna and M. Murni found that tablet technology can boost slow learners' motivation and interest in participating in

the learning process. The features of tablets include intuitive designs that enable the user to feel at ease and successfully utilize the gadget. Slow learners can finally utilize the tablet with ease because to its straightforward design. Naturally, intuitive design ensures that consumers understand what to do as soon as they see it. As a result, those who study slowly can simply be guided in using tablets for learning.

Mobile Application Development on Detection and Diagnose of Learning Disability for Children

The research by G. Rajivsureshkumar, K.Malarvizhi, and G.Deebanchakkarawarthi (2019) showed That smartphone application will help people with learning disabilities live more comfortably. The mobile application system helps the person with a learning handicap improve their language and math skills. As a social development service, this application also focuses on the growth and brain stimulation of a community with learning disabilities. The mobile application was created to facilitate registration, information gathering, and a clinically-based questionnaire-based disability test. To help with learning disabilities, basic language and math tests should be administered. To develop a solution for a community, it integrates computer science and neuron science. It creates computer models for memory and attention. This application's main objective is to increase the brain efficiency of those with learning disabilities.

2.3 Conclusion

This chapter has examined the international and national literature as review related to dyslexia, mainstreaming education, Using technology especially Mobile Assisted based and Slow pace learners. The complex nature of dyslexia and how to mainstream them using ICT to be specifically Mobile Assisted Language Learning and its implementation has been examined throughout this chapter along with the difficulties and challenges. In order to gain further insight into the reality of implementing and accessing mainstreaming education for children with dyslexia, this study will thus investigate the real-life experiences of primary school students of grade three in Dhaka city and also show the interests of their parents and teachers.

CHAPTER THREE: THEORETICAL BACKGROUND

3.1 Introduction

"Mainstreaming" is first used in 1970's where the main objective was to indicate and explain the contemplation of educating children who have disabilities and children with non-disabled peers in the identical classroom. Mainstreaming Education refers children having disabilities either physical or learning will be putting into a school classroom with the peers with non disabilities with having any discrimination. On the other hand, Dyslexia is a learning disability that affect one's Phonological processing, spelling and rapid visual-verbal responding (National Institute of Neurobiological Disorders and Stroke,2011). Dyslexia is considered as a life- long condition and the symptoms of it may differ at various stages of a person's life but significant results could be found by timely and perfect and appropriate treatments.

3.2 Mainstreaming education

Mainstreaming education is a education process where the children with disabilities is included into general educational settings or regular schools (IBE-UNESCO).

It shoud ensure,

1. to address the needs of all students.
2. to remove all the barriers which can hinder their participation.

3. to provide inclusive and accessible school infrastructure, learning methods, pedagogies and teaching and learning elements among others (IIEP-UNESCO,2019)

3.3 Origin of Mainstreaming education

Only one out of every five children with disabilities received an education in public schools in the United States prior to the 1975 passage of the Education for All Handicapped Children Act (EHA). Additionally, it was reported that there were almost 2 lac children in the United States with various disabilities, and that very few, if any, educational services were available to them. Additionally, more than a million kids were denied access to education. A further 3.5 million children with impairments attended school, but they lacked the necessary educational supports. The EHA then established a mission of assisting these special needs children so that they might live more independently in their community. For this reason, the EHA was renamed the Individuals with Disabilities Education Act (IDEA). The mainstreaming strategy started to be adopted more frequently in the 1980s so that children may be placed in environments with fewer restrictions. The IDEA was amended in 1997 to tighten the criteria for properly integrating children with disabilities. That is how the process of integrating education into society got underway.

3.4 Practices of Mainstreaming education in Bangladesh

There are some policies and legislation for the children with disabilities in Bangladesh. The existing policies and legislations are given below:

1. The National Education Policy, 2010
2. Primary Education Development Program-III(PEDP-III)
3. Persons with Disabilities-Rights and the Protection Act, 2013
4. Protection of Persons with Neuro-develpnental Disability Trust Act,2013

Accounting to the existing policies and legislations, Bangladesh has taken some steps to execute mainstreaming education.

Types	Grade 1		Grade 2		Grade 3		Grade 4		Grade 5		Grand Total		
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	All
Physical Handicap	1895	1239	1775	1273	1708	1237	1531	1177	1105	932	8014	5858	13872
Poor Eyesight	577	429	598	458	672	533	688	581	531	532	3066	2533	5599
Short of Hearing	123	95	135	108	150	131	141	146	109	102	658	582	1240
Problem in Speech	975	798	896	739	822	715	723	696	442	465	3858	3413	7271
Intellectual/ Mental	1812	1284	1582	1311	1351	1210	1006	967	563	600	6314	5372	11686
Autistics	210	162	157	108	119	90	94	79	72	44	652	483	1135
Others	307	219	232	211	232	227	204	200	155	167	1130	1024	2154
Total	5899	4226	5375	4208	5054	4143	4387	3846	2977	2842	23692	19265	42957

Table 1 Enrollment of Special Need Children in Government Primary School (GPS) by Type of Disabilities, Grade, and Gender, 2019.

According to this report, the taken steps are:

1. Making School infrastructure disability friendly
2. Support to accessibility (provide assistive devices through especial fund) allocated by SLIP (School Level Improvement Plan)
3. Teaches and staff recruitment policy changed which has impact on recruiting people with disability
4. Teachers training on disability in short course

5. Diploma in primary education curriculum and text have been changed to included disability technical matter to trainer the teacher comprehensively
6. School text has been changed to use disabled friendly word/sentences
7. School curriculum changed and included disability matter on how to deliver the lessons
8. Stipend for children with disability 400 BDT per month
9. Quota system for admission of the children with disability
10. Provide additional time during exam (30 minutes) for the children with disability
11. Additional help from script writer for the children with visual disability
12. Regular monitoring and reporting of the mainstream system
13. School catchment area survey which also include the data of children with disability
14. Job description of teacher and supervisor have been changed
15. Establishment of School for children with neurodevelopmental disorder (e.g. PROYASH)

3.5 Global scenario of mainstreaming education

3.5.1 United Kingdom

"Children with special education needs, including those children with statements of special educational needs, should, where appropriate and taking into account the wishes of their parents, be educated alongside their peers in mainstream schools," the Department of Education stated in 1994 in Florin and Florin, 1998:2.

Children with impairments in the UK were considered uneducable before to the early 1970s, and health authorities were responsible for providing them with training (Vaughan, 2002). As a result of the 1970 Education Act's passage, 8000 children with disabilities from 100 hospitals and 24000 children with disabilities from other training facilities were enrolled in educational programs for the first time (Vaughan, 2002). This was the country's first official legal endeavor to force enrollment in school for all children who were of school age (Vaughan, 2002). The Local Education Authorities (LEAs) were given responsibility by the 1976 Education Act changes to integrate children with disabilities in mainstream education, however at that time the provision was not frequently followed (Vaughan, 2002). However, because this was not viewed as a matter of human rights, the Warnock Report on Special Education in England, Scotland, and Wales (1978) raised the integration of children with special needs into the educational system as a national agenda. The report merely made the case that special education would benefit some kids (Vaughan, 2002).

3.5.2 China

China categorizes disabilities differently from other countries, according to the Census of 2006. For instance, China identified 5% of its school-aged population as needing special education while the United States identified 10% of its school-aged population. This difference is due to China's failure to recognize learning disabilities or disorders like ADHD as requiring special services, whereas many other countries do. The absence of educational options for Chinese people with disabilities leads to increased poverty and substandard living situations.

The Deng, Meng, Kim Fong Poon-Mcburger, and Elizabeth B. Farnsworth studies suggest that (2001). A Social Cultural Review of the Development of Special Education in China,

Children with disabilities attend school at a rate of 60% to 70%, compared to over 100% for children without disabilities.

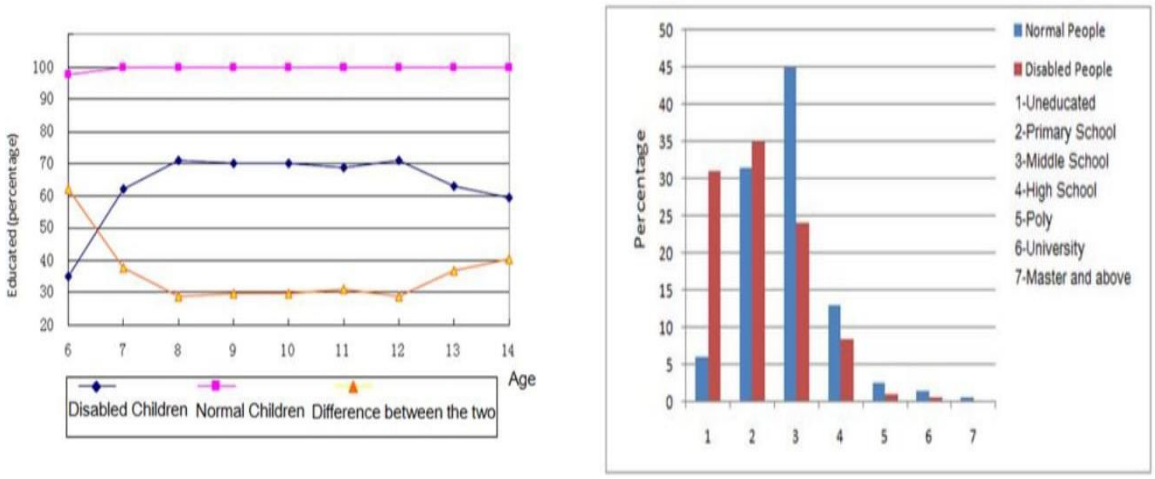


Figure 1 Number of percentages of enrollment of different level education or normal people and disabled people in China (source: Educational Status of Persons with Disabilities: Lack of Equity and Level Slip, 2011: "残疾人的受教育状况：公平缺失与水平滑坡")

3.5.3 Japan

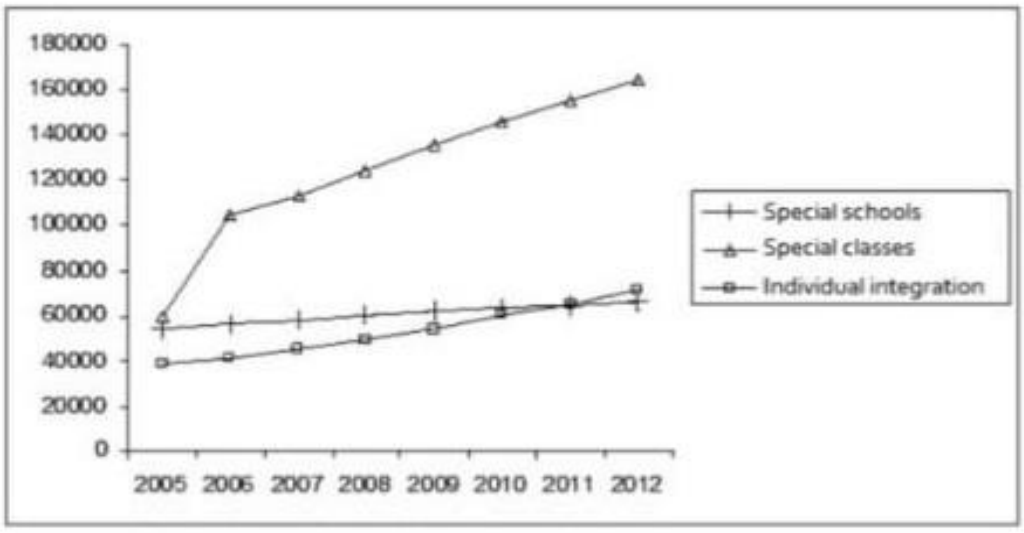


Figure 2 Evolution of headcounts by schooling structures for disabled children (2005-2012) (source: MEXT2005b, 2012c)

3.5.4 India

The enrollment, retention, and academic performance of children with disabilities have been improved through a number of efforts by the federal and state governments (UNICEF, 2003). The inclusion of children and young people with disabilities in all general educational settings, from Early Childhood to Higher Education, is emphasized in the National Action Plan for Inclusion in Edu cation of Children and Youth with Disabilities developed by the MHRD in November, 2005. (Govt.of India, 2006).

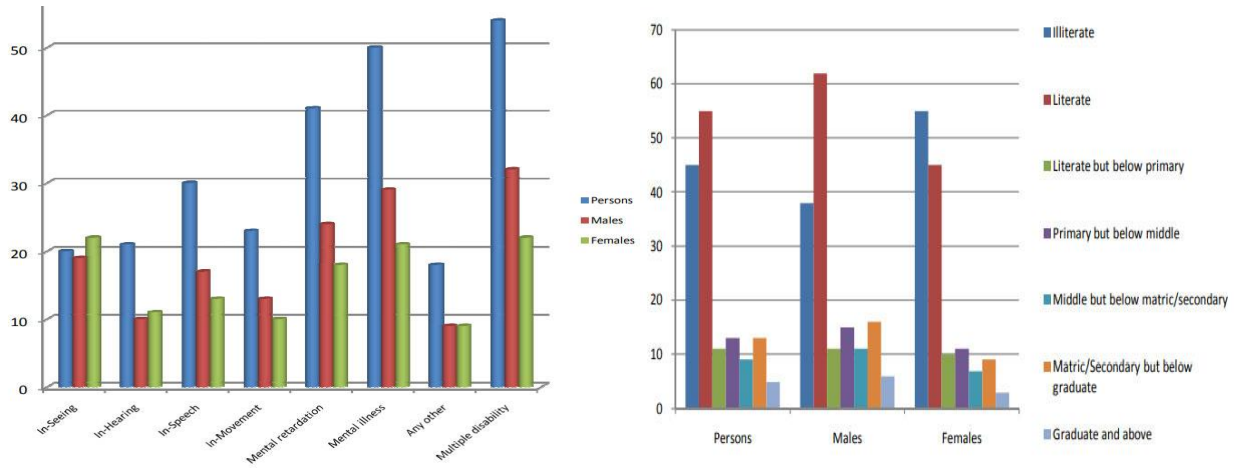


Figure 3 Mainstreaming education with multiple disabilities in India (source: Disabled Persons in India: Data and Facts,2022)

According to "Disabled Persons in India: Data and Facts,2022), as the above chart shows, 54% people with multiple disabilities never attended an educational institution (% shows the enrollment of institutions). Among the male disabled persons, 38% are illiterates. 16% of the disabled male population has secondary education but are not graduates and 6% are graduates and above. About 9% among the male disabled literates are graduates.

Among the female disabled persons, 55% are illiterates. 9% of the disabled female population has secondary education but are not graduates and 3% are graduates and above. About 7.7% among the female disabled literates, are graduates.

3.5.5 United States of America

In the US, many federal and state laws, as well as civil rights movements and judicial rulings from court cases, define the education of children with disabilities and other ities (Friend & Bursuck, 1996 in Florin & Florin, 1998). In the US, Section 504 of the Civil Rights Act of 1964 marked the beginning of the transition from segregation to inclusion (Croser, 2004). The Vocational Rehabilitation Act, passed in 1973, outlined the anti-discrimination viewpoint toward people with disabilities. Two years later, in 1975, the PL94ation the Education of All Handicapped 142, the fundamental law establishing inclusive education, was passed (Florin & Florin, 1998).

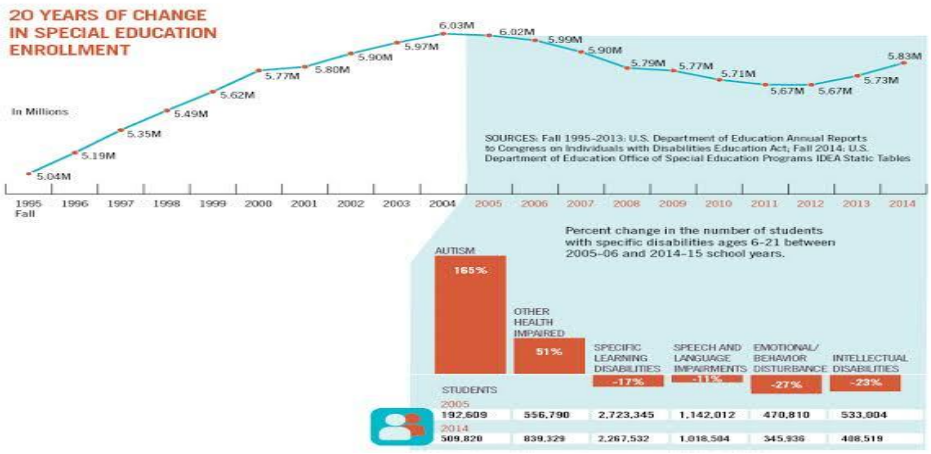


Figure 420 years of change in special education enrollment (source: U. S. Department of education, education week research center)

3.6 Conclusion

Mainstreaming education is nowadays one of the most discussed topics in education all over the world. Children with various disabilities are increasingly being educated and encouraged along side their peers who are not disabled. Where many developed countries has taken potential steps to mainstream the children having disabilities enhancing policies and acts, Bangladesh is not behind from the them in terms of enhancing policies and acts though the appropriate application of these policies and acts need to mainstream the children with different disabilities.

3.7 Dyslexia: Definition

The International Classification of Diseases (ICD-10) and The Diagnostic and Statistical Manual of Mental Disorders (DSM-5)

"A pattern of learning issues known as dyslexia is an alternate term for problems with accurate or fluent word recognition, poor decoding, and poor spelling skills."

IDA (International Dyslexia Association) definition of Dyslexia

"Dyslexia is defined by the IDA. A specific learning problem with neurological roots is dyslexia. In addition to having trouble spelling and decoding, it is marked by difficulties with accurate and/or fluent word recognition. These difficulties often stem from phonological deficiencies in language, which are frequently unanticipated in light of other cognitive talents and the delivery of efficient classroom learning. The development of vocabulary and background information may be hampered by reading comprehension issues and a decreased reading experience, which are secondary effects. (IDA Board adopted in November 2002".)

National Institute of Neurological Disorders and Stroke

"A learning disorder known as dyslexia specifically affects a person's reading comprehension. Despite having normal intelligence, these people frequently read at significantly lower levels than would be expected. While dyslexia manifest differently in each individual, those who have it frequently struggle with spelling, phonological processing—the manipulation of sounds—and/or rapid visual-verbal response. Dyslexia commonly develops in adults following a brain injury or in conjunction with dementia. In some families, it can also run in the family, and current research has identified several genes that may put someone at risk for dyslexia".

British Dyslexia Association

"A unique learning disability known as dyslexia primarily interferes with the acquisition of literacy and language-related abilities. It is most likely present at birth and has affects that last a lifetime. It is characterized by challenges with working memory, processing speed, phonological processing, quick naming, and the automatic acquisition of skills that may not be on par with an individual's other cognitive talents."

Dyslexia Association of Ireland

"A continuum of specific learning difficulties relating to the acquisition of fundamental reading, spelling, and/or writing skills, which are unexplained in relation to a person's other abilities and educational experiences, characterize dyslexia. On a neurological, cognitive, and behavioral level, dyslexia can be described. It is characterized typically by inefficient information processing, including challenges with working memory, quick naming, and automaticity of fundamental skills. Organizational, sequencing, and motor skill difficulties could also be present."

Spanish Federation of Dyslexia

"Dyslexia is a learning disability that affects both reading and writing because it makes it difficult to differentiate and memorize letters or groups of letters, the order and rhythm in which letters form words, and the poor structure of phrases."

Dyslexia Association of Singapore

"Reading, spelling, and writing difficulties are all part of the neurologically based specific learning disability known as dyslexia. The areas of language acquisition, phonological processing, working memory, and sequencing may all show accompanying deficiencies. Dyslexia is brought on by a number of things, including low motivation, attention deficit disorder, and academic frustration. The quantity and quality of exposure to that language and other languages affects how obvious dyslexia is in a given language. With languages that have more complex orthographic, phonological, and/or grammatical systems, dyslexics are likely to struggle more."

Hong Kong Dyslexia Association

"Dyslexia is a unique learning disability that affects how well people understand and use written language. Reading, writing, and spelling difficulties are common among dyslexic students. A mix of phonological, visual, and auditory processing deficiencies may be the root of dyslexia. It is frequently unexpected when compared to a child's general aptitude and is not the result of inability or a lack of learning opportunities."

Health Council of the Netherlands, Working Definition

"When word identification (reading) and/or word spelling are not automated or are automated only very partially or extremely difficultly, dyslexia is present. The creation of an automated process is referred to as automatization. Such a technique is distinguished by a high degree of speed and accuracy. It happens automatically, with little mental effort, and is challenging to control, dismiss, or influence. According to the working definition, dyslexia is defined in practice by a significant reading and spelling impairment that is chronic and defies conventional teaching strategies and remedial attempts. It will be accompanied by extremely sluggish, incorrect, and easily distracted word identification and word spelling upon examination."

Kuwait Dyslexia Association

"The main symptom of dyslexia, a learning condition, is difficulty with written language, especially in reading and spelling. It is independent and distinct from reading difficulties brought on by other factors, such as non-neurological vision or hearing impairments, inadequate or subpar reading training, or both."

Mayo Clinic Dyslexia Definition (May, 2013, US)

"A learning disability called dyslexia is characterized by problems of reading. Dyslexia, often known as specific reading difficulty, is a typical learning issue in kids. Children with normal vision and intelligence can develop dyslexia. Sometimes dyslexia go undetected for a long time before becoming recognized in adults. Dyslexia has no treatment available. It is a chronic disorder that alters how your brain functions and is brought on by hereditary features. However, with tutoring or a customized education program, the majority of dyslexic youngsters can achieve academic success. Additionally crucial is the role of emotional support."

National Centre for Learning Disabilities Dyslexia Definition

"Dyslexia, like other learning disorders, is a lifetime issue that is inherited by a person. This language processing problem can make it difficult to read, write, spell, and occasionally even talk. Dyslexia is not an indication of stupidity or laziness. Additionally, it is not brought on by poor vision. Dyslexia is basically a neurological disease that alters how the brain interprets and processes information in both children and

adults. People from all socioeconomic and racial origins can have dyslexia. Frequently, a family will have multiple dyslexic members. The National Institute of Child and Human Development estimates that up to 15% of Americans struggle significantly with reading."

American Psychological Association Diagnostic and Statistics Manual IV Definition of Dyslexia (criteria for Reading Disorder, under which dyslexia falls, 1994)

A. The individual's reading proficiency, as determined by individually administered standardized tests of reading comprehension or accuracy, falls well short of what might be predicted given the individual's age, assessed intelligence, and level of schooling for their age.
B. The issue with Criterion A considerably hinders learning or daily tasks that call for reading comprehension.
C. If a sensory loss is present, reading problems go beyond those typically linked to it.

Following these definitions, it could be said that dyslexia is not a disability like autism, intellectual disease, blindness or behavioral disorders but as Nijakowska (2010) has affirmed that it is a lifelong condition, a unique learning impairment that can be improved by supporting a student with accurate strategies.

"A language-based learning disability called dyslexia impacts a person's ability to learn to read (accuracy and fluency), as well as their ability to develop spelling abilities. Due to deficiencies in the phonological aspect of language, people with dyslexia have trouble connecting spoken and printed words. The ability to accurately and fluently decode words can have an impact on vocabulary growth and reading comprehension"(Kim, Y.S Wagner ,R.K and Lopez.D,2012 & Snowling,M.J, 2019)

"Spelling errors may interfere with the creation of written compositions. Poor academic performance, low self-esteem, and a lack of enthusiasm can all be consequences of dyslexia. It happens to people of all intellectual abilities and is not a symptom of insanity, laziness, or bad vision."(Berninger, V. W, Lee,Y.L, Abbott,R.D & Breznitz,Z, 2013 & Denton,C.A, Fletcher, J.M, Anthony, J.L, & Francis, D.J, 2006)

"Dyslexia is a particular learning problem with neurobiological roots that is defined by challenges with correct and fluent word recognition as well as by weak spelling and decoding skills. These issues are often brought on by a phonological impairment in language, which is frequently unanticipated in comparison to other cognitive skills and the delivery of successful classroom education."(Lyon,G.R, Shaywitz, S.E & Shaywitz, B.A, 2003)

Although a common definition of dyslexia has not yet been established, researchers and scientists from all over the world have come to a growing understanding of the traits and symptoms of this condition as well as how dyslexia affect the development of reading and spelling. The prognosis is positive for people who get intense, systematic interventions, despite the fact that dyslexia is a lifetime condition and some modifications may always be required in educational and vocational contexts. It is difficult to comprehend the effects of dyslexia on self-esteem and academic and occupational performance unless a parent or teacher has firsthand experience with the suffering and academic stress this disorder causes (Voeller, 2004).

3.8 A brief history of dyslexia

All kids desire to learn to read, as Betts noted in 1936, but for some, it's a difficult undertaking that takes years of well-planned interventions. Since well over a century ago, researchers in medicine and education have worked to uncover the causes of certain people's reading difficulties and, more crucially, how to overcome them. Often referred to be the most prevalent learning disorder, dyslexia. In actuality, reading is the main issue for 80% of those who are identified as having learning impairments (U.S. Department of Education, 2006).

Although some people believe that learning disabilities are a relatively recent category, their conceptual roots may be found at least as far back as the early 1800s, making them almost as old as many of the other disability categories (Hallahan & Mercer, 2002; Wiederholt, 1974). In reality, Gall's assessment of adults who had lost the ability to speak in 1800 marked the beginning of the scientific study of learning disorders (Hammill, 1993). It's interesting how many of the findings made about the existence and longevity of this condition in the late 1800s still hold true today. At first, dyslexia were thought to be one of the aphasias, which included losses in reading and writing as well as other parts of language. The term "word blindness" was first used to characterize people who were not physically blind but appeared to have trouble recalling the visual representations of words needed for reading and spelling.

Despite being able to physically see the letters and words, the person had trouble reading them or pronouncing them. Word blindness would eventually be supplanted by the term's dyslexia, developmental dyslexia, or specific reading handicap during the course of the 1920s and 1930s. Adults made up the first case studies of people who had lost the ability to read due to a stroke or other brain injury. Physicians from the United States, Germany, and the United Kingdom described these patients in an effort to pinpoint the traits, underlying causes, and most effective therapeutic approaches for these reading impairments (Anderson & Meier-Hedde, 2001).

Word blindness was described as either congenitally present or acquired. Congenital word blindness existed before the person learnt to read, but acquired word blindness was brought on by trauma after the person had already learned to read (Pickle, 1998). Although some online sources, like Wikipedia, state that Oswald Berkhan first described dyslexia in 1885, it appears that Rudolph Berlin, a German ophthalmologist, was the first person to actually use the term dyslexia in a written document to describe reading difficulties brought on by cerebral disease (Richardson, 1992; Wagner, 1973).

Berlin spoke about a number of his patients who struggled to understand written text and experienced headaches while reading. Berlin's description of dyslexia in a book he produced in 1884 classified it as a type of aphasia, similar to Kussmaul's word blindness, but less severe. Berlin discovered left hemispheric anatomical lesions in the postmortem dissections of six instances (Wagner, 1973). Despite the fact that the term dyslexia had just been coined, word blindness was more widely used at this time. Two other examples of congenital word blindness were printed in 1896. Health official James Kerr published the first instance of a youngster with average ability who suffered from word blindness while being able to spell the individual letters (cited in Critchley, 1964). The second piece, written by Pringle Morgan in 1896, highlighted the traits of a bright 14-year-old kid who had "congenital word blindness," excelled in arithmetic but was unable to read. James Hinshelwood and Pringle Morgan both expanded on the research on congenital word blindness in children from that on acquired word blindness in adults (Hallahan & Mercer, 2002).

3.9 Children with dyslexia

3.9.1Types of Dyslexia

According to Susan du Plessis, a reading specialist with more than 30 years of experience in the learning disabilities field and Dr. Zelda Strydom dyslexia could be classified into followings:

Dyslexia based on causes:

1. Primary Dyslexia
2. Secondary Dyslexia
3. Developmental Dyslexia

4. Acquired Dyslexia

Dyslexia based on symptoms:

1. Phonological Dyslexia
2. Surface Dyslexia
3. Deep Dyslexia

Types by some other researchers:

1. Letter Position Dyslexia
2. Attentional Dyslexia
3. Letter Identifying Dyslexia
4. Neglect Dyslexia
5. Vowel letter Dyslexia

3.9.1.1 Primary dyslexia

Clinicians have long recognized that dyslexia run in families, increasing the likelihood that a kid may also experience the learning disability. When dyslexia arise from a genetically inherited problem, it is referred to as primary dyslexia.

3.9.1.2 Secondary dyslexia

Reading difficulties brought on by issues with early parenatal brain development are referred to as secondary dyslexia. Note that dyslexia is seen as developmental in both its primary and secondary forms.

3.9.1.3 Developmental dyslexia

The term "developmental dyslexia " refers to children who have never learnt to read correctly and as a consequence, even though they can both read and write, they use all their mental and attentive energies because unlike their peers, the process is not automatic.

3.9.1.4 Acquired dyslexia

The term "acquired " refers to reading disorders because of a brain damage though before the injury, reading abilities were normal.

The primary distinction between these two types of dyslexia is between "central dyslexias," in which the deficit influences one of the two procedures essential to reading aloud, and "peripheral dyslexias," in which the functional disorder affects the most peripheral level of the incoming/outgoing information processing (Denes, Pizzamiglio, 1996)

3.9.1.5 Phonological Dyslexia

Trouble segmenting words into syllables and smaller sound units known as phonemes are symptoms of this type of dyslexia (Coltheart,2001).

Other reading and spelling habits of kids with phonological dyslexia are listed by Smith (1991):

1. A poor memory for specific sounds or sound sequences.
2. Having trouble combining individual sounds to form words.
3. Difficulty listening to words and replacing one sound with another (for example, say cat; now remove the /c/ and replace it with a /f/).
4. Difficulty recalling individual letters' sounds as well as the sounds that phonetically regular and irregular letter combinations represent.
5. Difficulty deciphering unknown words due to inadequate phonetic knowledge and trouble sequencing sounds.
6. Vowel sounds are especially challenging.
7. Making assumptions about unfamiliar words rather than using word-analysis techniques.

8. Spelling is still performed by sight rather than by ear, which keeps it below reading level.
9. Correct spellings mostly appear on words that the child has seen before and can therefore reimagine.
10. Weird spellings that don't follow phonetic patterns and are rarely recognizable, even by children.
11. Incorrect spelling with extraneous letters and omitted syllables.

3.9.1.6 Surface Dyslexia

Children with this form of dyslexia have trouble reading since they can't decipher words by sight. For a few reasons, sight-reading is a crucial talent. One is the challenging spellings of some terms. Children must be able to recognize numerous frequent words at a glance in order to read fluently and accurately (Newcombe & Marshall, chap. 2, 2017).

Other reading and spelling habits of kids with surface dyslexia are listed by Smith (1991):

1. Uncertainty about letters with different orientations (b-d, p-q).
2. Words that can be dynamically reversed cause confusion (was-saw).
3. Very few words are immediately recognizable from their entire configuration; instead, they must be laboriously sounded out as if they were being seen for the first time.
4. Losing track of where you are because you didn't immediately recognize what you had just read, as when you looked from the right side of one line to the left side of the next.
5. Ignoring words and letters that weren't visually noted.
6. The first letter may be missed if the eye is moved too quickly to the next letter, masking the image of the first letter.
7. Difficulty with quick word retrieval due to poor visual retrieval.
8. Visual reading stimuli can be so perplexing that it is simpler for the child to learn to read by first saying the words aloud before writing them down.
9. Insertions, omissions, and replacements when the sense of the material directs reading.
10. Having trouble remembering the format of a letter when writing.
11. Uses phonetic spelling without being absurd (laf-laugh; bisnis-business).
12. Cannot spell simple irregular words but can spell difficult phonetic words.

3.9.1.7 Deep Dyslexia

The term "deep dyslexia" refers to a serious disability. Along with visual errors (e.g., badge is read as bandage), derivational errors (e.g., edition is read as editor), and difficulties reading functional words, it is accompanied by semantic errors (e.g., street is read as road) (e.g., as, the, so). A brain damage is frequently cited as the cause of deep dyslexia, an acquired reading disability (Mather & Wendling, 2012). Friedmann and Coltheart (2018) examine phonological dyslexia and deep dyslexia in their article titled "Types of developmental dyslexia." They differentiate between surface dyslexia and visual dyslexia, which are frequently used interchangeably. They further identify five other forms of dyslexia:

3.9.1.8 Letter Position Dyslexia

Those who lack this ability can accurately identify the letters but are unable to encode the word's letter order. The primary symptom of this type of dyslexia, known as letter position dyslexia (LPD), is the migration of letters inside words. As a result, terms like cloud, fried, and diary can all be read as could, fired, or diary. People with LPD also tend to misread words with doubled letters; for instance, they might read drivers as divers and baby as bay.

3.9.1.9 Attentional Dyslexia

Although letters move between nearby words in attentional dyslexia, they are correctly recognized and maintain their original relative positions within the word. Pair cane love, for instance, can also be

interpreted as lane love or even lane cove.

3.9.1.10 Letter identify Dyslexia

The function of the orthographic-visual analysis, which is in charge of producing abstract letter identities, is impaired in people with letter identity dyslexia. Since readers with this dyslexia can still visually match two instances of the same letter in various sizes and accurately copy letters, it is not a visual impairment. Readers with LID, however, are unable to access the abstract identity of letters from their visual form. As a result, they are unable to name letters, recognize written letters based on their names or sounds, or match letters in various cases (such as A and a) or fonts.

3.9.1.11 Neglect Dyslexia

A neurological disorder where a person is blind to half of their visual field. Either the word's beginning (left neglect) or end (misreading) components are incorrect (right neglect). These mistakes are not simple deletions; instead, they are frequently educated approximations at actual, wrong words that have roughly the right number of characters. Neglect dyslexia causes a person to read blend as lend and displayed as show.

3.9.1.12 Vowel letter Dyslexia

Vowels are omitted, substituted, transposed, and added by people with vowel dyslexia. The term bit can therefore be interpreted as bat, but, or even boat.

According to some academics, there isn't enough evidence to back up utilizing dyslexia subtypes to direct assessment and intervention (Peterson et al., 2014).

3.9.2 Misconceptions about Dyslexia

The different ways that dyslexia is defined, as well as how the term is used and abused, probably add to the misconceptions that already exist. One erroneous belief is that dyslexics are completely incapable of reading. Like the majority of ailments, dyslexia has a spectrum of severity, ranging from moderate to severe. The majority of dyslexic people can learn to read, although they often still struggle with rate and fluency issues, as well as relatively poor spelling. In order for educators, parents, and people with dyslexia to understand the true nature of the illness, it is crucial that they are aware of prevalent misconceptions regarding dyslexia. Some common misconceptions are : (According to Tunmer & Greaney,2010),

1. Dyslexics are unable to read.
2. People with high IQs cannot have dyslexia.
3. Dyslexia involves thinking in reverse.
4. Dyslexia affects boys more often than girls.
5. Dyslexia affects all struggling readers.
6. Dyslexia is a rare impairment.
7. Childhood Schizophrenia.
8. A result of poor teaching or limited educational opportunity.
9. Related to ethnic background or family income.

3.9.3 Levels of Dyslexia

Dyslexia should be defined according to four specific levels (Kormos, Smith,2012; Doyle, 2002). The levels are:

1. Behavioral
2. Cognitive

3. Biological and
4. Environmental

3.9.3.1 Behavioral Level

Despite the fact that dyslexia can manifest in a variety of ways and has a number of other symptoms, it appears to be apparent on a behavioral level that it is related to difficulties with reading. Due to the fact that reading ability can be improved while spelling issues persist over time, a reading test cannot be used as the sole indicator of dyslexia (Firth, 1999)

3.9.3.2 Cognitive Level

Dyslexic children exhibit poor phonological skills at the cognitive level (Bowen & Delaney, 2012). They consequently encounter a variety of challenges when reading and spelling, mostly new words. Students may experience severe difficulties as a result of their inadequate abilities.

3.9.3.3 Biological Level

On a biological level, it is believed that dyslexia may have a neurological foundation (Hinshelwood, 1895 & Morgan, 1896). Jules Dejerine, a French neurologist, was the first to postulate in 1891 that injury to the left occipital region, which is crucial for processing "optic pictures of letters," was the primary source of reading and writing impairments. According to Samuel Orton (Orton, 1925; Thompson, 1967), a left-hemispheric predominance in phonological language processes may be associated to language difficulties in dyslexic students.

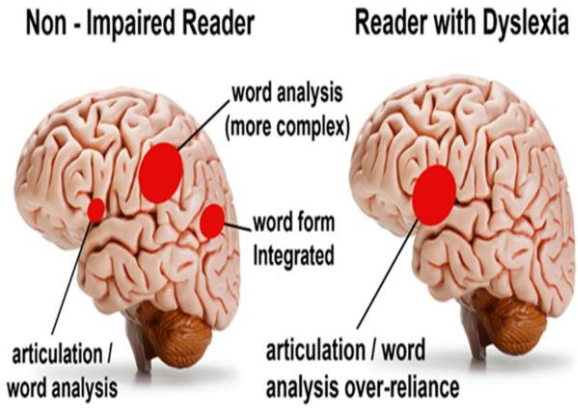


Figure 5 Brain image of dyslexic and non-dyslexic children (source: Orton, 1925; Thompson, 1967)

There are three main parts of the brain: The cerebrum, the cerebellum and the brainstem.

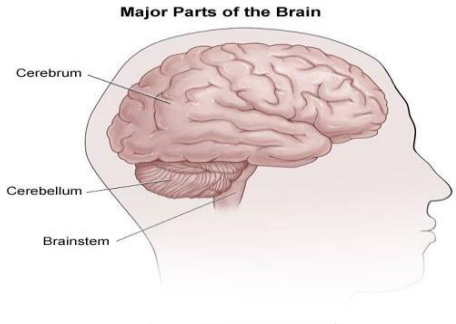


Figure 6 Major parts of the brain (source: Ohio State University Wexner Medical Center)

3.9.3.3.1 Cerebrum

The left and right hemispheres of the large, wrinkled portion of the brain. Based on the visible groves or fissures, each hemisphere is further divided into four lobes. The occipital lobe is in the back of the head, the frontal lobe is close to the forehead, and the parietal and temporal lobes are in the middle.

The Wernicke's region on the rear of the temporal lobe and Broca's area on the frontal lobe are two small areas in the left hemisphere that are specifically crucial for reading (near the occipital lobe).

3.9.3.3.2 Cerebellum

It controls physical motor control, including muscle movements, posture maintenance, and balance, and is situated toward the back of the head. Although it has been significantly linked to reading, its major function is to keep us alert.

3.9.3.3.3 Brainstem

This more compact region, which attaches to the spinal cord, regulates eye and mouth movement as well as the transmission of sensory information (hot, cold, pain, bright, loud), breathing, hunger, consciousness, cardiac function, body temperature, and involuntary movements like coughing and sneezing. Although reading does not involve this area, it is nevertheless necessary to breathe in order to read.

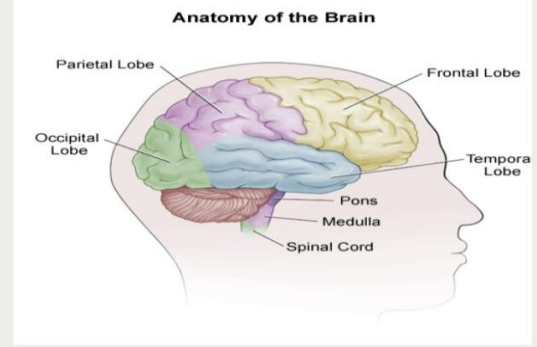


Figure 7 Anatomy of the brain (source: Ohio State University Wexner Medical Center)

According to the most recent research of Ohio State University Wexner Medical Center, the dyslexic brain interprets printed words differently. Strong readers rely more on regions at the back of the brain, commonly referred to as the "wordform" area between the Occipital and Temporal lobes (near to, but not precisely at, Wernicke's area), whereas weak readers rely more on Brocca's areas in the left frontal lobe of the cerebrum.

This region in the back left of the brain is particularly active during fluent reading for proficient, non-dyslexic readers; words are identified here at lightning speed! It resembles a database of words you know off by heart that is read-only. Dyslexic people don't use this highly effective part of the brain; instead, they make up for it by using more of the frontal lobes, which is less efficient. Dyslexics gradually use parts of the right hemisphere to augment their reading abilities. However, because these areas are not as effective for reading, those who read slowly but accurately wind up exerting a lot more mental energy for little gain.

3.9.3.3.4 Genes

Chromosomes 6 and 18 have been linked to dyslexia, according to the UK's Dyslexia Research Trust, a nonprofit that funds research into learning disorders. For instance, they examined 50 genetic markers within 15 genes on chromosome 6 that are expressed in the brain and discovered a substantial correlation between the KIAA0319 gene and poor performance on tests of reading, spelling, orthography, and phonology. Identical outcomes have been discovered in several research.

3.9.3.4 Environmental Level

According to Kormos and Smith (2012), many children may experience school failure and ensuing "severe emotional and social problems," which might exacerbate their academic situation. Because of this, it's critical to provide each dyslexic youngster with the tools necessary to overcome their challenges.

3.9.4 Symptoms of dyslexia

According to Tunmer & Greaney, 2010:

1. Difficulty in learning word rhymes.
2. Difficulty learning the names and sounds of the alphabet's letters.
3. Confusing words and letters that share a similar visual appearance (e.g., b and d and was and saw).
4. Misreadings of letters with related sounds (like /f/ and /v/).
5. Letter and word reversals and transpositions that continue after age 7 (e.g., p and q, and on and no).
6. Difficulty spelling when the letters aren't in the right order.
7. Difficulty reading and spelling irregular words because of trouble remembering their visual representation (e.g., once).
8. Using various spellings of a word on the same page (e.g., wuns, wunce, for once).
9. Using word sound instead of letter sound when spelling words (e.g., sed for said).
10. Difficulty correctly pronouncing some multisyllabic words (e.g., multiblication).
11. Slow word perception that affects the speed and fluency of reading.
12. Naming and timing related problems.

According to Arif, 2015:

1. Slow reading.
2. Have trouble to utter a word combining all letters.
3. In the time of reading, firstly,they see the word misspelled then utter wrongly.
4. Have problems to utter the pseudo words.

According to the Mayo Clinic, a non-profit worldwide leader in medical care, the symptoms of dyslexia are:

Before school:

Signs that a young child may be at risk of dyslexia include:

1. Late talking
2. Gradually picking up new words
3. Issues correctly forming words, such as misplacing words with similar sounds or flipping sounds in words
4. Having trouble recalling or naming letters, numbers, or colors
5. Having trouble picking up rhymes or participating in rhyme-based games

School age:

Once a child is in school, dyslexia symptoms may become more apparent, including:

1. Reading significantly below the age-appropriate level
2. Having trouble processing and understanding what is heard
3. Having trouble coming up with the right phrase or formulating answers to questions
4. Difficulties remembering events in order
5. Difficulty recognizing similarities and differences between letters and words (and occasionally hearing them).
6. Being unable to correctly pronounce a word that is unfamiliar to you

7. Spelling issues
8. Taking an exceptionally lengthy time to finish reading or writing-related chores
9. Avoiding reading-related activities

Teens and adults:

The symptoms of dyslexia in teens and adults are very similar to those in children. Teens and adults with dyslexia frequently experience the following symptoms:

1. Slow and labor-intensive reading and writing 2. Difficulty reading, including reading aloud
2. Poor spelling
3. Avoiding reading-related activities 5. Mispronouncing names or words or having trouble recalling words
4. Taking an exceptionally long time to finish reading or writing-related chores
5. Trouble summarizing a narrative
6. Difficulties with foreign language learning
7. Having trouble solving math word problems

3.10 Present situation of dyslexia in Bangladesh

Though there is no exact information about dyslexia in Bangladesh, there are some clues that will help to estimate the number. In Bangladesh, there has no dyslexia foundation or Association like developed countries. Let's see the related issues those are concerning about dyslexia.

According to a 2015 study published in the International Journal of Advanced Research (2015), Volume 3, Issue 12, 1327–1331, the incidence of dyslexia in Dhaka's primary schools is 9.02 percent.

"Prevalence of Dyslexia in Primary School in Dhaka: It's Effects on Children's Academic and Social Life" (2015), in this research, the researchers (M.Ali & A.S.M.Sarwar) have a study with comprised of 133 students of grade 4 (65 boys and 68 girls) of three primary schools in the Mohammad Pur area in Dhaka. They have shown 9% children has dyslexia though they didn't test them clinically.

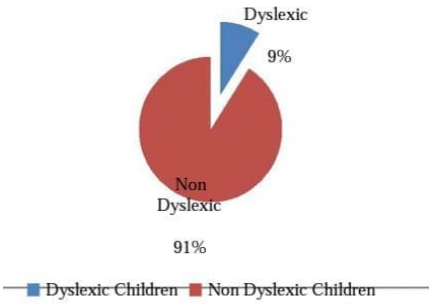


Figure 8 Percentage of dyslexic children in Bangladesh (source: Ali & Sarwar, 2015)

Almost 10% of primary school pupils in Bangladesh according to Dr. Hakim Arif, a professor in the department of Communication and Disorders at the University of Dhaka, exhibit dyslexia-related symptoms.

According to UNICEF (2022), only 18% of the children have foundational numeracy skills and 66% of third graders in Bangladesh struggle with reading. "Children's learning suffers when they are unable to directly interact with their teachers and their peers," said Catherine Russell, executive director of UNICEF. Their ability to learn could be permanently lost if they are unable to interact with their teachers and peers. The report also shows that compared to 39% of students who remained in school, just 29% of students who drop out from school during the past year possess the fundamentals of reading.

According to an internal report by the Department of Primary School, over 70% of children in Bangladesh who complete their primary education are unable to read, write, or count correctly (DPE).
According to the National Assessment of Pupils of Grades Three and Five - 2006 research, 69% of students who had finished five years of primary school were unable to read news headlines in Bangla newspapers correctly, while 87% of students were unable to perform basic arithmetic calculations.
The Second Primary Education Development Programme (PEDP-II), a donor-supported program to provide quality primary education for all children, conducted the survey, which found that 72% of kids couldn't compose a brief piece in Bangla, the language spoken by more than 95% of the population.

3.11 Global scenario of dyslexia

According to the International Dyslexia Association (2007), World Dyslexia Network Foundation (2008), and Dyslexia Research Institute (2008).

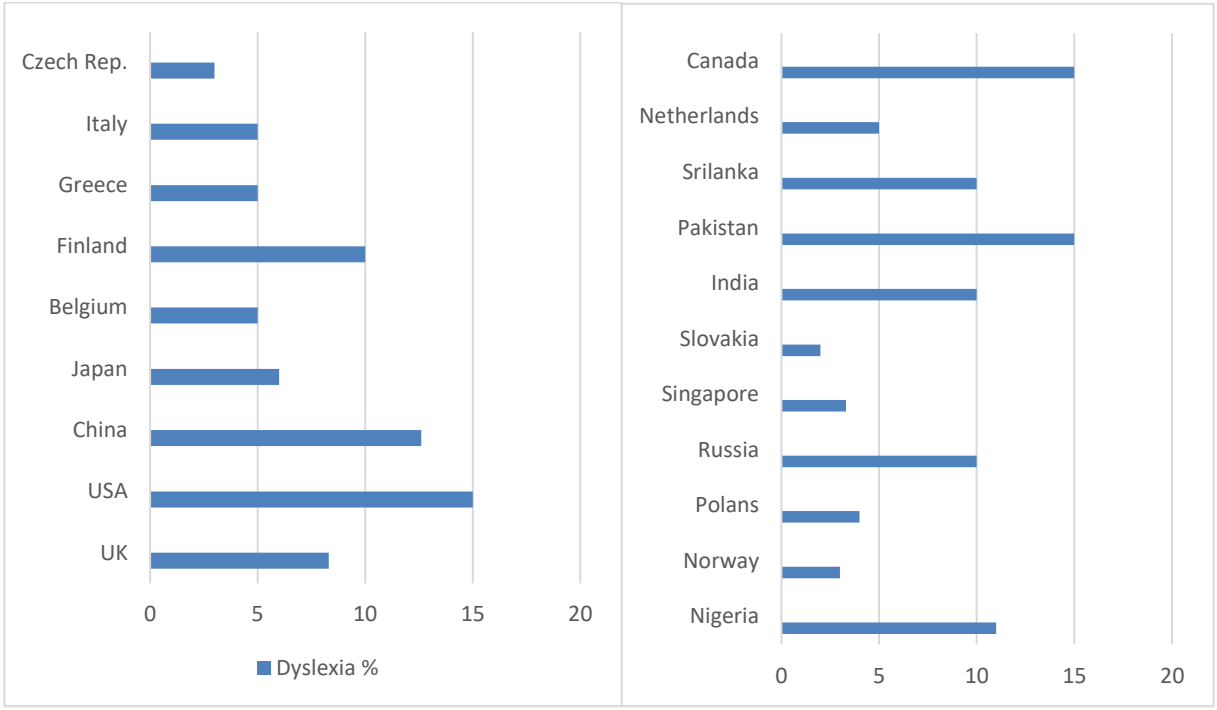


Figure 9 Global scenario of dyslexia (source: International Dyslexia Association (2007), World Dyslexia Network Foundation (2008), and Dyslexia Research Institute (2008)

3.12 Learning differences connected to dyslexia

According to Atres (1972), as a result of poor organization, shorter concentration and attention span, children might also have problems in integrating information coming from different channels.
The National Center for Learning Disabilities (NCLD), The Leicestershire Dyslexia Association and Barnsley College state the following:

3.12.1 Dysgraphia

"A learning condition called dysgraphia impacts writing, which calls for a sophisticated set of motor and information processing abilities. Dysgraphia makes writing challenging. It may result in issues with handwriting, spelling, and putting thoughts on paper. Dysgraphia can make it difficult for a person to arrange words, numbers, and letters on a line or page."

According to Erickson (2013), dysgraphia does not mean that they are unable to write rather they just need more time to Express what they think and they can feel a physical pain, which is the main reason of an illegible handwriting. Dysgraphia manifest itself as a difficulty in producing both alphabetic signs and numerical symbols.

3.12.2 Dyscalculia

"Dyscalculia is a broad category of math-related lifelong learning impairments, according to the NCLD. Math disabilities come in many different forms. People with dyscalculia can differ from one another. Additionally, how it affects individuals depends on their stage of life. Visual-spatial problems and issues with language processing can both be present in dyscalculics. This indicates that individuals struggle to digest and comprehend what they hear."

According to Joffe (1990), approximately 60% of children having dyslexia also have dyscalculia. Erickson (2013), states that Dyscalculia is learning difference which pertains to a deficit in counting but does not deal with problem solving.

3.12.3 Dyspraxia

"The organization of movement is impaired or immature in developmental dyspraxia. It is an immaturity in the way the brain processes information that causes improper or incomplete transmission of messages. The Greek "praxis," which means "doing or acting," is where the name "dyspraxia" originates. The planning of what to do and how to execute it is impacted by dyspraxia. It is linked to issues with perception, speech, and thought."

Other related issues include a lack of focus, attention, and fluency in communication (Kormos, Smith, 2012)

3.13 Mobile Learning

The prevalence of portable gadgets today is one of the main draws of mobile learning. By the middle of 2010, there were five billion mobile phones (cell phones) in use worldwide, which is equivalent to having three times as many phones as computers. According to analysts of the mobile phone market, there will be six billion mobile phones in use by the middle of 2012. (BBC, 2010).

One of the most widely adopted technologies in history is mobile service. Over the previous five years, the number of mobile phone accounts globally has quadrupled, to roughly 5.5 billion, while the global population has increased to around 6.7 billion. Statistical data shown in the following:

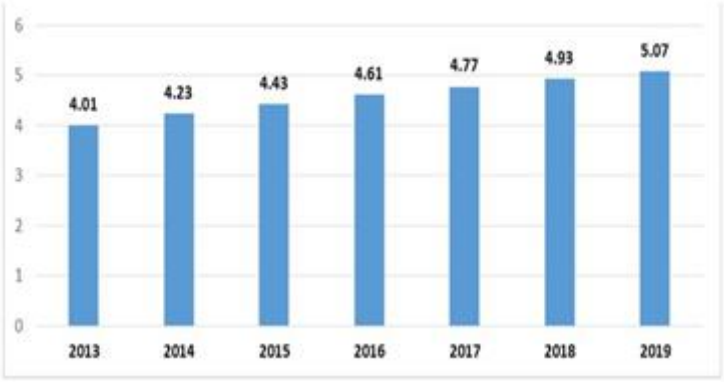


Figure 10 Mobile phone users worldwide (in billion) (source: International Telecommunication Union and reviewed by MIT technology Review and Statista Research Department, 2022)

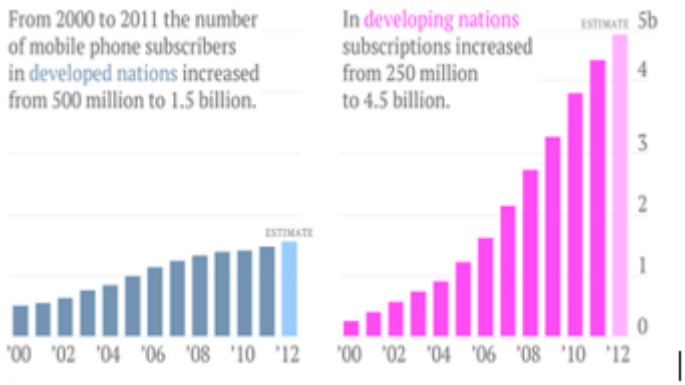


Figure 11 Comparison of increasing mobile phone subscribers between developed and developing nations (source: Jana)

Nearly 15 billion mobile devices were in use worldwide in 2021, up from slightly over 14 billion the year before. By 2025, there will be 18.22 billion mobile devices worldwide, an increase of 4.2 billion from the number in 2020 (Statista Research Department, 2022)

In Bangladesh, the rate is also increasing day by day.

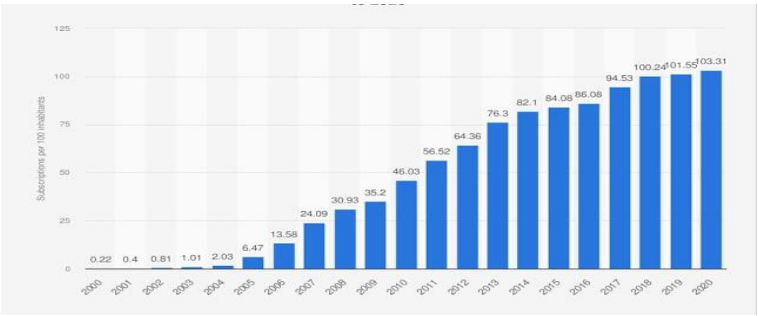


Figure 12 Number of mobile cellular subscriptions per 100 inhabitants in Bangladesh from 2000 to 2020 (source: Statista, 2021)

Today, many of the tasks that were previously only performed by more expensive and less portable desktop and laptop computers are now handled by smartphones and less powered feature phones with computing and internet browsing capabilities. However, its pervasiveness in so many facets of life encourage a blending of the lines between routine activities, entertainment, employment, and education (Kukulska-Hulme & Pettit, 2009)

The ability to be accessed "anywhere, anytime" (Geddes 2004) and the technologies employed are two typical ways to identify m-learning: Possibly, "any educational provision where the sole or dominating technologies are handheld or mobile devices. Although in practice it is more frequently limited to palmtop devices, according to Traxler (2005) being a component of the provision.

It was already said a few years ago that mobile devices, at least in the UK, were "a familiar part of the lives of most instructors and students" (Facer, 2004:1). However, its incorporation into instruction and learning has happened more gradually, as Teachers have tried to figure out how to use these technologies to promote diverse learning kind of education. An examination of mobile learning initiatives supported by EU funding, Since, 2001, mobile phones have been the most widely used technology (Pcherzewska &

Knot, 2007), a gadget that is utilized in these projects most frequently, followed by personal digital assistants (PDAs) and other handhelds, as well as personal audio players (such as iPods), a little less focus. While in the past mobile technologies have frequently been used to characterize mobile learning, more recent thinking has placed a greater emphasis on the learner's mobility (Sharples, 2006). Frequently, the informal elements, m-learning are also highlighted (e.g., Masahita 2003, Fallahkhair et al. 2007).

3.14 Advantages of Mobile Assisted Language Learning

The effectiveness of this way of learning will always depend on good pedagogical design (Demouy & Kukulska-Hulme, 2010). Incidental learning of vocabulary from reading can be supported through eBooks with dictionaries or eBooks with adaptive software for vocabulary learning, however unless learners are highly self-motivated, the effectiveness of this way of learning will always depend on good pedagogical design (Fisher et al., 2009).

Some groups may not have ready access to the latest devices. Older learners are more likely to have problems with eyesight and manual dexterity which may affect their ability to participate fully in mobile learning. The relatively small size of handheld devices presents a challenge in terms of usability. Speech recognition is likely to make interaction easier for some users. Students with visual impairments or dyslexia need not be excluded if they are able to listen to digital talking books or podcasts instead of reading.

The relatively small size of handheld devices presents a challenge in terms of usability (reading text, on-screen interaction), although in general this is becoming less of an issue as new device and user interface designs are continually improving. Indeed, the work of Danaher, Moriarty and Danaher 2009) with mobile communities draws attention to the fact that access to suitable technologies is often limited to the scope and duration of particular projects. Also, students with visual impairments or dyslexia need not be excluded if they are able to listen to digital talking books or podcasts instead of reading (Barton et al., 2007).

Mobile-assisted language learning is one of the key application areas of mobile learning. Colpaert (2004) reflected on why mobile language learning was slow to take off, despite rapid developments in mobile technologies. Learner expectations, skills and habits need to evolve to match the potential of mobile and ubiquitous technologies. This should result in new designs for language learning that relate more closely to emerging patterns of technology ownership, use, mobility and access.

Students are no longer required to stay in one place or use a desk computer. However, they can access study materials and connect with teachers or classmates in fun settings like restaurants or even bus terminals (Caudill, 2007). With these tools, students are no longer confined to four-wall classrooms (Chinnery, 2006). Mobile devices' distinct feature has a number of other benefits.

For instance, according to Kennedy and Levy (2008), the portability, accessibility, and widespread use of specific mobile devices like mobile phones, wireless laptops, and media players make MALL apps and devices extremely stimulating for language learners. According to Begum (2011, pp. 110–111), among MALL devices in teaching and learning classrooms, mobile phones have many advantages, including: accessibility, portability, pervasiveness, students' freedom, promotion of learning, involvement of students in learning with a more relaxed and comfortable environment, enjoyment of classrooms, removal of boredom in language teaching, increasing participation, reducing feeling shy, cost savings, promoting an interactive and virtual classroom, connecting to the outside world, and more.

Additionally, Sevari (2012) thinks that some of the benefits of cell phones in education include advancing and enhancing students' understanding of difficult concepts, following teachers' instructions, matching

students' needs and interests, enhancing critical thinking skills, making effective use of time, and not wasting class time. Sevari also believes that students' interest in utilizing mobile phones and their affordability make learning easier.

3.15 Limitations of Mobile Assisted Language Learning

Despite its advantages, MALL as a teaching tool has several drawbacks. On its small screen, many academics and researchers concur. For instance, this concern with mobile devices has been brought up by (Begum, 2011; Goundar, 2011; Chinnery, 2006; Thornton and Houser, 2005 & Mehta, 2012).

The conventional language learning content cannot be accommodated by cell phones because of their small screens, according to Begum (2011) and Goundar (2011). Chinyer (2006) criticizes MALL devices for their small screens and keyboarding issues because of one finger data entry. Insufficient teacher training to set up mobile learning activities using cell phones in the classroom, high costs associated with setting up language learning activities via sending SMS and data transmission, discomfort associated with using the tiny keyboard and small keypads, reading SMS, word limits, fixed storage space, difficulty using mobile tools in noisy environments, and communication failure are additional problematic factors (Begum, 2011; Mehta, 2012 & Goundar, 2011).

Other educational, social, and personal drawbacks exist in addition to these. Students would be distracted and disrupted by mobile devices inside of classes. For instance, Sevari (2012: 21) claims that mobile learning devices can have drawbacks like sending brief messages during class time, transmitting and receiving test responses, bothering others, placing a heavy burden on the teacher, addressing educational issues brought on by forgetting to bring mobile phones, failing to function in learning mode, failing to take into account the needs, skills, and interests of students, and delaying message sending and receiving due to network outage The costs associated with downloading multimedia information was another restriction that prevented some participants, especially students, from utilizing phones for learning purposes, according to Mtega, et al. (2012) in their discussion of the drawbacks of mobile phon

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

The current situation of dyslexic children in primary schools in Bangladesh and the way to mainstream them is examined in this study. The qualitative approach utilized to address the study goal is presented in this chapter. The steps and techniques followed during the research process are made plain, and the methodological decisions are discussed and supported. The methods for creating and analyzing data are offered, along with an explanation of the methods used to choose the research sample. The actions done to improve research quality are evaluated. The ethical implications and the research design's limitations are then examined.

4.2 Research Methodology

A research methodology is a scientific way of solving a research topic that includes collection of data utilizing a variety of methodologies, data interpretation, and data conclusions. A research method is essentially the study's blueprint.

The literature, language, vocabulary, other theories, explanations, methods, and type of analysis that will be utilized to understand the data and information gathered are all described in the methodology. Since the methods and procedures constitute the core of the research activities, they should be given in as much detail as possible and the relationships between them should be clear (Weirsma and Jurs, 2005, p. 416).

Approaches that are phenomenological and positivist, also known as quantitative and qualitative approaches (Dumay, 2008). The Center for Local Economic Strategies' executive director, Neil McInroy, asserts that adopting the incorrect research techniques and designs results in a shaky foundation for any future review, assessment, or strategy (Macdonald et al., 2008, p. 9). These approaches are studied using two fundamental methods: quantitative and qualitative research methods.

The technique, guiding principles, and guidelines by which we approach issues and look for solutions are referred to as research methodology. Research is also divided into categories based on the conventional approach it uses. Research methods utilized in educational studies fall into three categories: mixed methods, qualitative methods, and quantitative approaches (Mertler & Charles 2011).

According to Goulding (2002), the researcher's preferences, convictions, and beliefs should guide the methodological decision-making process. When selecting a study methodology, additional important aspects like epistemological considerations should be taken into account (Buchanan and Bryman, 2007). In addition to philosophical underpinnings and individual convictions, there are practical considerations that can affect a researcher's choice of methodology, such as the availability of data or information, time, and other resources (Ahmed et al., 2016, p. 32).

Methodology, according to Polit and Beck (2004), relates to techniques for gathering, organizing, and analyzing data. According to Creswell (2003), methodology is a logical collection of procedures that complement one another and have the capacity to produce data and findings that reflect the research question and serve the researcher's objectives. According to Bowling (2002), methodology refers to the entire framework of the research study, including the methods for determining sample size and composition, data collection procedures, and data analysis procedures.

The research question and its importance are explained in the methodology. It discusses the purpose of the research's inception, its course, and any potential effects it might have after it is finished.

4.3 Qualitative Approach

Qualitative is a subjective, systematic method of characterizing meaning (Burns & Grove, 2003). Qualitative research is typically connected with words, language, and experiences, as opposed to measurements, statistics, and numbers.

The qualitative research technique is a method of phenomenological research that enables the researcher to produce a distinct, recognizable account of the diverse, overlapping, and common experiences, events, and processes (Lincoln & Guba, 1985; SullivanBolyai, Bova, & Harper, 2005).

The mainstreaming education of children with dyslexia in Bangladesh is complex, involving multiple stages and interactions, such as the opinion of school teachers and parents of children with learning disability, school enrollment, the changing behavior of the children with dyslexia, and the obstacles and challenges of mainstreaming education. Instead, qualitative research aims to provide a detailed account of a rich experience in easily accessible language (Sullivanescription of the Bolyai et al., 2005).

The researcher strives to investigate and comprehend a phenomenon, a process, or the perspectives and worldviews of the participants (Caell I et al., 2003). Therefore, a qualitative description approach provides the possibility to collect detailed descriptions of a phenomenon about which little is known. Within the process, the researcher seeks to remain near to the "surface of the data and events" (Sandelowsk I 2000, p. 336), where the participant's experience is recounted (SullivanBolyai et al., 2005). While Neergaard, Olesen, Andersen, and Sondergaard (2009) highlight that the analytical process and presentation of data are crucial to the use of qualitative research, data interpretation at the level of the researcher is equally

essential to its use. Sandelowski affirms this viewpoint (2010). She emphasizes that the data never speak for themselves and that it is the researcher's responsibility to make sense of the facts. In the present study, this was accomplished by forming themes and subthemes from clusters of thoughts shared by several individuals (Willis, Sullivan Cohen, 2016).

The original setting is one of a kind, allowing for the generation of deep information and insight that paints a vivid picture of the participants' lives and social environments (Holloway, 2005).

Qualitative research, in contrast to quantitative studies, does not rely on predetermined methods or formalized equipment to generate new information. Therefore, it requires the systematic, yet intuitive, collecting and analysis of subjective narrative data in order to determine the unique features and relevance of the human experience (Holloway, 2005).

Qualitative data collecting techniques, as noted by Brink and Wood (1998), are malleable and unstructured; they can record either verbatim reports or observable qualities, and their results are not typically represented numerically.

4.4 Research questions

1. Is there any pedagogical issue for their slow learning?
2. Have their parents social class affected them for being slow learners?
3. What linguistic feathers (phonology, morphology, syntax) along with mathematics need to be improved first using Mobile Assisted Language Learning tools?
4. How this process encourages them to carry out a number of exercises?

These research questions aim to find out how the adaptability of mobile assisted language learning tools be applied in accordance with particular student.

4.5 Research Design

The "procedures for collecting, evaluating, interpreting, and reporting data in research investigations" are known as "research designs" (Creswell & Plano Clark 2007, p.58).

It is the general strategy for linking the relevant (and doable) empirical research to the conceptual research concerns. In other words, the study design determines how the data will be collected, how it will be analyzed, and how it will be used to answer the research question. (Grey, 2014)

Hancock Bolyai, Knafl, & Algozzine (2006) claim that the choice of a research design is based on how well it permits thorough exploration of a certain research question. Using a qualitative research design was chosen for this study's objectives. Understanding the situation being researched from the participant's perspective rather than the researcher's is the primary objective of qualitative research; this is known as the "emic," or insider's perspective (Hancock and Algozzine, 2006).

In order to better understand mainstreaming education from the viewpoints and experiences of those engaged, primarily teachers and parents of children with learning difficulties, a qualitative method was used. Hegarty, referenced in (1989, as Punch 2006, p. 110), contends that qualitative methods of inquiry are the most effective for examining many themes in special education.

In this study, phenomenological approaches were primarily used to explore human "lived experience," which gave researchers a better knowledge of a certain way of life and how the subjects who were being studied experienced it (Creswell, 2011). Phenomenological investigations, according to Hancock and Algozzine (2006), "examine the significance of numerous people's lived experiences surrounding a single subject or occurrence."

The purpose of this study is to investigate the fundamentals of using Mobile Assisted Language Learning to mainstream education for a group of students with learning difficulties, specifically dyslexia. The essence or core meaning of a phenomenon is described through the analysis of the experiences of various people.

4.6 Area of the Study

The choice of the study area is crucial in any research study. The study was only conducted in one Government Primary School in Dhaka, the capital of Bangladesh, because it was more convenient for the researcher in terms of time and location.

4.7 Sampling Techniques

All of the children having dyslexia and their parents and teachers in Bangladesh are the population of the study. Among this population, every child, parents and teachers of the children with dyslexia are considered as the unit of analysis.

A sampling method that enables this is necessary since the researcher always aims to produce an in-depth understanding in a qualitative study (Braun & Clarke, 2013). The purpose of this study was to demonstrate how mobile assisted language learning could help Bangladeshi students who struggle with dyslexia fit into the mainstream.

Purposive technique was employed as the researcher wanted to see-

1. the pedagogy of school.
2. the previous class notes of the students.
3. either the students have other disabilities or not.
4. the perceptions about this learning disability among the parents and teachers.
5. the social background of the students.
6. environment of school.

4.8 Recruiting of Participants

Contact was first made with the school's head teacher and the assistant teachers in order to extend an invitation to participants in the study. The school was personally contacted, and teachers and parents were sent a letter from the researcher along with an information sheet detailing the goals of the study and the specifics of participation. All research subjects received confidentiality guarantees from the researcher. The involvement of the students and instructors at this school was encouraged since it was thought that they may offer insightful information on mainstreaming practices and how to organize services for students with learning difficulties. The researcher also chose a smaller group of five parents. The school principals were used to get in touch with the participants. Each parent received an introduction letter and an information sheet, just like the members of the school personnel. As information about their children would be provided in the study but would not include their children's names, it was crucial to contact parents with specific information about the participation in a sensitive manner and to explain the objective and content of this research. All participants were reminded of the importance of maintaining the children's, families', and schools' confidentiality at this time.

4.9 Sample Size

4.9.1 Sample one

Since there aren't many dyslexic children in Bangladesh who have had clinical testing, the researcher initially went to the school and interviewed all 25 of the third-grade pupils there to collect data. While gathering data, proficiency in phonological, morphological, and syntactical processes is assessed. Seven students were afterwards chosen from that group who had dyslexia signs. However, five of them were

found to be fully dyslexic when they were ultimately evaluated in the Clinical Psychology department laboratory at the University of Dhaka. These five kids make up the study's first and major sample.
The report information of those students given below:

Student 1
Age: 13 years 04 months 25 days
Sex: Male
Grade: 3
Social behavior: Culturally appropriate
Speech and Language: Appropriate. No pressure of speech.
Attention and Concentration: Seemed good
Vision problem: No
Hearing problem: No
Attitude: Rapport was built
Emotional expression: Mostly happy during the assessment session
Dyslexia score (CLDQR): 3.45 (score 2 or over indicates may have Learning impairment or dyslexia)
Intellectual disabilities: No

Student 2
Age: 09 years 10 months 30 days
Sex: Female
Grade: 3
Social behavior: Culturally appropriate
Speech and Language: Appropriate. No pressure of speech.
Attention and Concentration: Seemed good
Vision problem: No
Hearing problem: No
Attitude: Rapport was built
Emotional expression: Mostly happy during the assessment session
Dyslexia score (CLDQR): 3.55 (score 2 or over indicates may have Learning impairment or dyslexia)
Intellectual disabilities: No

Student 3
Age: 09 years 10 months 29 days
Sex: Male
Grade: 3
Social behavior: Culturally appropriate
Speech and Language: Appropriate. No pressure of speech.
Attention and Concentration: Seemed good
Hearing problem: No
Vision problem: No
Attitude: Rapport was built
Emotional expression: Mostly happy during the assessment session
Dyslexia score (CLDQR): 3.00 (score 2 or over indicates may have Learning impairment or dyslexia)
Intellectual disabilities: No

Student 4
Age: 09 years 11 months 18 days
Sex: female
Grade: 3
Social behavior: Culturally appropriate
Speech and Language: Appropriate. No pressure of speech.
Attention and Concentration: Seemed good
Hearing problem: No
Vision problem: No
Attitude: Rapport was built
Emotional expression: Mostly happy during the assessment session
Dyslexia score (CLDQR): 2.88 (score 2 or over indicates may have Learning impairment or dyslexia)
Intellectual disabilities: No

Student 5
Age: 10 years 8 months 19 days
Sex: Male
Grade: 3
Social behavior: Culturally appropriate
Speech and Language: Appropriate. No pressure of speech.
Attention and Concentration: Seemed good
Hearing problem: No
Vision problem: No
Attitude: Rapport was built
Emotional expression: Mostly happy during the assessment session
Dyslexia score (CLDQR): 3.10 (score 2 or over indicates may have Learning impairment or dyslexia)
Intellectual disabilities: No

The other two children have the score of 1.6 and 1.4 which indicates that they are not dyslexia though they are also slow pace learners.

4.9.1.1 Reason for taking samples of grade III

Children with the age of (8-9) will be developing into an increasingly fluent reader where (9-10) will be encouraged to read widely and (10-11) will hopefully be reading independently. If they struggle with reading then they might have speech or Language difficulties like dyslexia (OXFORD OWL).

4.9.2 Sample two

The sample of four class teachers for individual interviews consisted of school teachers of the same school and all of them were female. All teachers had mixture experience of working with children with various disability.

Type: All the teachers are those who were currently taking their classes.

4.9.3 Sample Three

The sample of five parents consisted of two females and three males. For all parents, their children have dyslexia but they even do not know the symptoms.

4.9.3.1 Social status

Three of them lower middle class and the other two was from lower class.

4.10 Interview Guidelines

In order to have an accurate and thorough grasp of the realities of mainstreaming education, it is necessary to get personal perspective. "Interviews provide extensive insights into the histories, experiences, beliefs, values, aspirations, attitudes, and feelings of individuals" (May, 2001, p.120). Dexter (1970, as referenced by Bell, 2010) defines an interview as "a talk with a goal," which is more than just an intriguing conversation.

The researcher used a semi-structured interview rather than a structured interview because the semi-structured interview allowed for greater latitude within the dialogue, for both interviewer and interviewee, while still allowing for comparable data analysis. A semi structured interview is a qualitative form of open inquiry with a predetermined set of questions.

Frequently, semi-structured interviews are open-ended, permitting flexibility. Asking predetermined questions in a predetermined order facilitates comparisons between responders, but can be restrictive. Less structure can facilitate the identification of trends, while still permitting comparisons between responders. According to Bryman and Bell (2007), semi "usually refers to a setting in which a structured interview is defined as the interviewer having a series of questions in the general form of an interview schedule but being permitted to modify the sequence of questions." Semi structured interviews use a "guide" with subjects that the interviewer wishes to explore, but the questions asked based on the guide are open-ended, and the interviewer is urged to allow the respondent take the lead. Semi-structured interviews proved to be an effective study method.

A semi-structured interview is a form of data collecting when questions are asked in accordance with a specific set of topics. The questions, however, are not arranged in any particular fashion or even in terms of wording.

The data gathered from semi-structured interviews are often qualitative in research settings. They are commonly employed as a means of preliminary investigation in the domains of marketing, sociology, and survey technique.

It allowed participants to provide extensive responses and gave the researcher the flexibility to clarify or elaborate on certain responses, or rearrange the order of questions as needed. Although the interviews followed a study, the themes and topics of discussion were compatible with the research aims. All interviews were conducted in Bengali and were meticulously recorded on paper by the researcher, who then transcribed them to determine the true theme. In order to acquire general information pertinent to the topic of mainstreaming children with dyslexia, the researcher has produced a semi structured interview guide for the current study. It is regarded that the semi structured interview is one of the most effective techniques for eliciting the interviewers' thoughts on a given issue, as it allows for the interviewees' ideas to be expressed in more depth. Therefore, it was the most appropriate method for answering the study questions associated with this research topic.

Interviews that are semi-structured combine elements of both organized and unstructured interviews. The majority of the questions are impromptu, although a select handful have already been decided upon.

4.11 Sources of data collection

In order to obtain information regarding each and every element of this study, primary and secondary sources of data have been collected in two times. Firstly, before using Mobile Assisted Language Learning and then after using Mobile Assisted Language Learning.

Students and their exam notes, instructors, and parents of children with dyslexia who were enrolled in

primary school in the Nilkhet region of Dhaka city in Bangladesh served as the primary sources of information for this study.

The secondary sources consisted of previous research, official statistics, government reports, web information, daily newspaper publishers, journals, and books, all of which contained news about mainstreaming education for children with a variety of disabilities, including dyslexia and Mobile Assisted Language Learning along with Technology.

4.12 Techniques of data collection

The requirements of the study should guide the selection of data collection methods. One or more data components employed inside each overarching research strategy. Data gathering tools and methods can range from simple to complex, but the basics always include things like questionnaires, interviews, surveys, projective techniques, and direct observation.

This investigation made use of both interview and observation procedures. Information was gathered through semi-structured interviews conducted face-to-face and through direct observation, using a guide developed specifically for this study. Semi-structured interviews were used to compile the data. Respondents recorded their verbatim experiences on paper, which were transcribed subsequently. In order to get to the heart of what our respondents had to say and Those who were interviewed, and their facial expressions and emotional states were observed.

4.13 Validity, Reliability and Generatability

The term "validity" is used to describe the degree to which a qualitative study's findings can be relied upon to accurately represent the situation under study and to provide convincing evidence for its conclusions. The concept of validity, as defined by Robert L. Barker (2003), is concerned with the degree to which a process can measure the characteristic it is designed to measure.

Consistency is the idea closest to reliability. According to Joppe (2000), Reliability is defined as "the extent to which results are consistent over time and an accurate representation under of the overall population study." Collecting "reliable data" is the goal of any data gathering effort. As a prerequisite to validity, reliability is essential. Simply put, the reliability and validity of a study determine its trustworthiness (Wiersma, 2000).

It is not the purpose of qualitative research to draw broad conclusions. More accurately, a large proportion of the population. The goal of a qualitative method is to help the researcher comprehend the world from the viewpoint of the responder. It seeks to address the question, "What makes this person, group, circumstance, or problem special?" Why?" The present research employs methods like observation, interviews, and recordings to increase its generalizability, which in turn enhances the study's reliability and validity and facilitates the analysis and comprehension of the building of future studies.

The research questions used in this study was aim to determine the reliability, validity and generatability of data.

4.14 Using Mobile Applications for Mainstreaming Dyslexic Children

There are many applications for children having dyslexia in the world. In this research, the researcher has selected few apps for their learnings in terms of improving various skills. Eye games, dyslexia and শিশু শিখা apps are used to improve their spelling and alphabetic skills. 10 Minutes School: Learning app and Sakho-the learning app was used to develop their morphological, syntactical and mathematical skills to make them mainstream.

First of all, the apps used in this research can be installed for free on the Google Play Store in Bangladesh. Initially, these apps were installed and set up on the device that the children have at home. A total of 450

hours were spent in this study just to teach how to use of Mobile Assisted Language Learning tools. The list of hourly schedules is given below

Linguistic elements	Given time(hours)
Bangla alphabet with phonetics	10
English alphabet with phonetics	10
Numerical digits	5
Bangla syllables	10
English syllables	10
Basic mathematics	5
Bangla morphology(words)	10
English morphology(words)	10
Bangla regular sentences	5
Bangla rhyming sentences	5
English regular sentences	5
English rhyming sentences	5
Total hours	90

Table 2 Per student given hour according to teaching elements

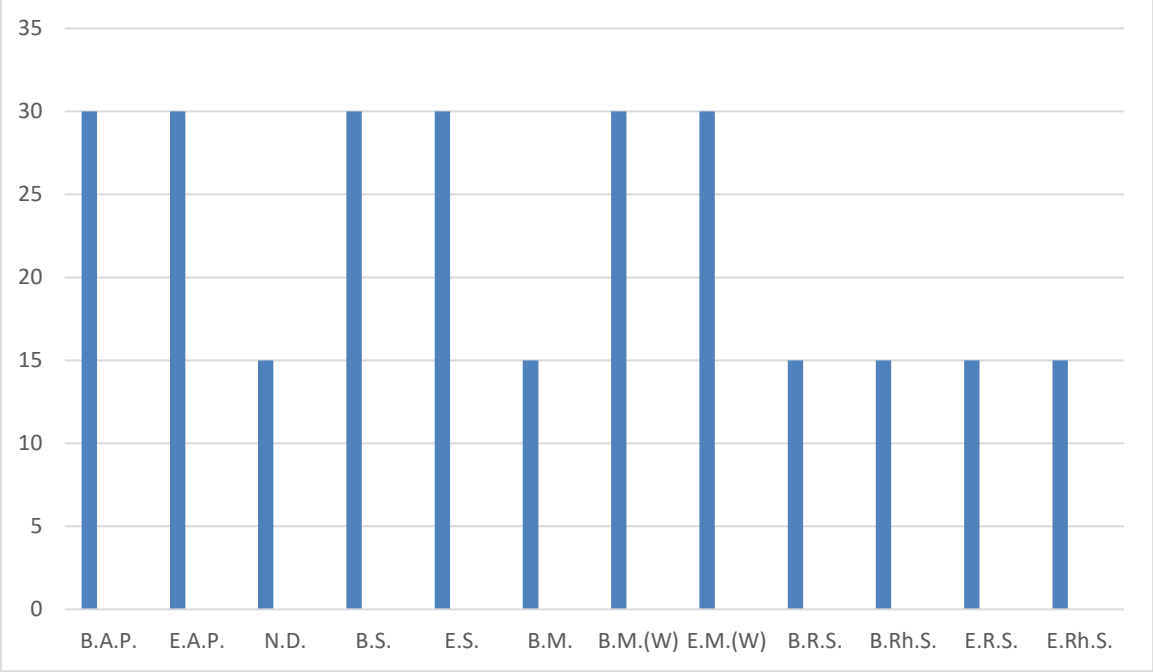


Figure 13 Total hours given for five students

4.15 Ethical Consideration of the study

Informed consent forms, anonymity, and confidentiality were all taken care of in this study to ensure it was conducted ethically. Consent is one of the most important strategies for protecting the rights of research participants by ensuring that they are not forced into taking part in the study against their will. Interactions between researchers and their participants are at the center of research ethics.

Due to the conversational nature of qualitative research, it is crucial for data collectors to clearly distinguish between the information participants provide and the information they provide themselves.

Therefore, the research was conducted with adequate secrecy, taking into account the sensitive nature of the data from the perspective of the individual being investigated. Participants in this study were open to being interviewed, but they lacked a preference for being recorded on tape. Instead, researchers transcribed their responses verbatim and added in our own comments.

Once more, one interviewee's answers have been done in secret from the other. In addition, the participants must be reassured that their information will be kept confidential for their own safety. For this reason, the respondents have designated their names as S1, S2, S3, S4 and S5 for students; P1, P2, P3, P4 and P5 for parents; and T1, T2, T3, and T4 for teachers in order to maintain the anonymity of the research. Research participants were also guaranteed to be shielded from any unnecessary intrusion, emotional anguish, humiliation, or physical reactions.

CHAPTER FIVE: DATA ANALYSIS

5.1 Before using Mobile Assisted Language Learning Tools

5.1.1 Pedagogy of the selected school

"Effective ways to teach start with understanding that there are many ways to learn. For the best learning, assessments should be done often and carefully, and they should be in line with what is being seen. Respect is shown to all of the students. When there are different ways to teach in a student-centered environment, learning is most effective." - The Mary Rose (2008)

Before the collection of data, the researcher has sat a total of eight classes with the students having the permission of the head teacher of the school where each teacher had two classes but the class teacher was not informed in advance. After having the classes, the following things have been found that shows a perfect pedagogy for grade three children.

5.1.2 The pre-engagement period

This phase is essential to the growth of the teaching-learning procedure.

1. Develop expectations and objectives.
2. Prepare the course outline, course map, and evaluation criteria.
3. Choose a textbook.
4. Choose supplementary resource material (colorful poster, maps etc.)
5. Select evaluations

5.1.3 Engagement Phase

The instructor engages the pupils in the teaching-learning process during this phase. Typically, students are instructed, lectured, discussed, and interacted with.

5.1.4 Post-Engagement Phase

During this phase, the teacher evaluates the overall efficacy of the completed teaching-learning endeavor and makes any required modifications to assure the success of future courses with the same scope. Analyses of summative assessments are conducted to determine the strengths and shortcomings of instruction and student learning.

All these activities are suggested as an effective pedagogy by Svinicki & McKeachie (2011). Effective learning objectives describe required student behavior, performance, or comprehension (Mandernach, 2003).

5.2 Social Class and Dyslexia

According to Tunmer & Greaney,2010, it is a misconception that the family background of a child causes dyslexia. In this research, the first three students come from a lower middle-class family where the last

two from lower class. Moreover, the good readers of grade three of this school are from lower income class family.

It might be argued that dyslexia (diagnosed or undiagnosed) have no effect on gaining qualifications because middle-class participants are more likely to succeed in school due to their socioeconomic status. The middle class has greater cultural capital than the working class (Skeggs, 1997; Sullivan,2001).

5.3 Data Analysis

Before using Mobile Assisted Language Learning, the following data indicates that children having dyslexia have the major concern of all the linguistic levels while mathematical issues alsp have the significant percentage. All the children have asked to read 100 alphabetic sounds from Bangla, English and Mathematics. They have also been asked to read 100 words (both regular, irregular and pseudo words) selected from their text book where 50 was from Bangla and 50 from English. Then again, they have asked to read 25 regular Bangla sentences and 25 rhyming sentences where another 25 was from regular English sentences and 25 from rhyming sentences. The statistics of facing difficulties has shown below:

5.3.1 Student 1: Alphabets

Stimuli	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	9	18%
English	26	12	46%
Mathematics	34	12	35%

Student 1: Words

Stimuli	Total words	Difficulties	Disabilities percentage
Bangla	50	29	58%
English	50	34	68%

Student 1: sentences

Stimuli	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	17	68%
Bangla rhyming sentences	25	21	84%
English regular sentences	25	19	76%
English rhyming sentences	25	21	84%

Table 3 Student 1 difficulties in reading, alphabets, words, and sentences

Difficulties in Reading Alphabets and Words

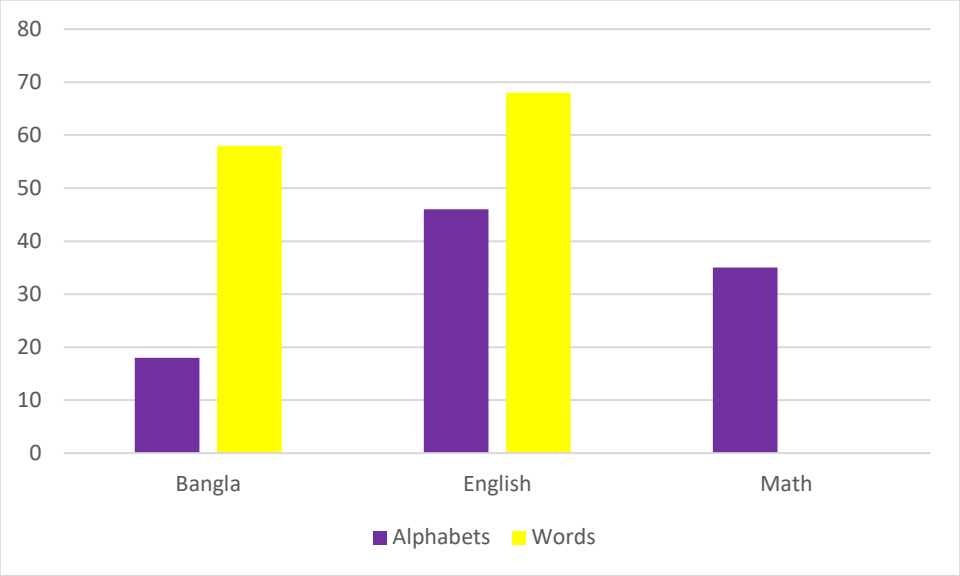


Figure 14 Student 1 difficulties in reading, alphabets, and words

Here, the X-axis represents alphabets and words level whereas, the Y-axis illustrates the percentage.

Difficulties in Reading Voiced and Unvoiced Sounds

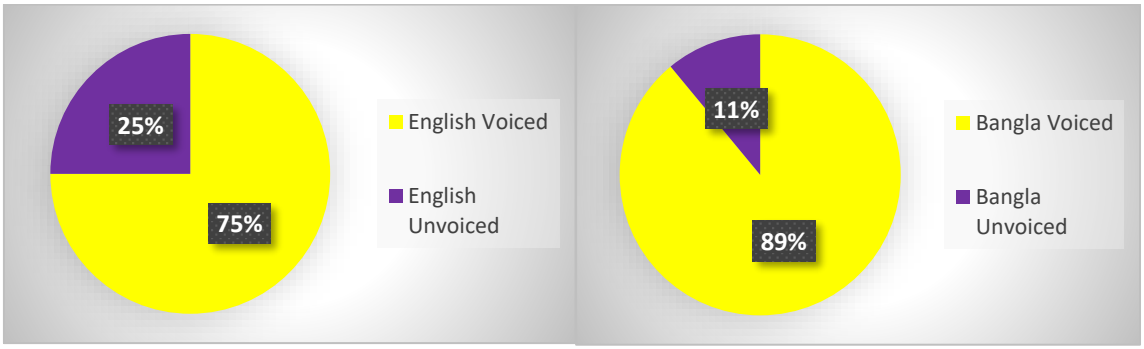


Figure 15 Difficulties in Reading Voiced and Unvoiced Sounds from Bangla and English Language

Difficulties in Multisyllabic Words

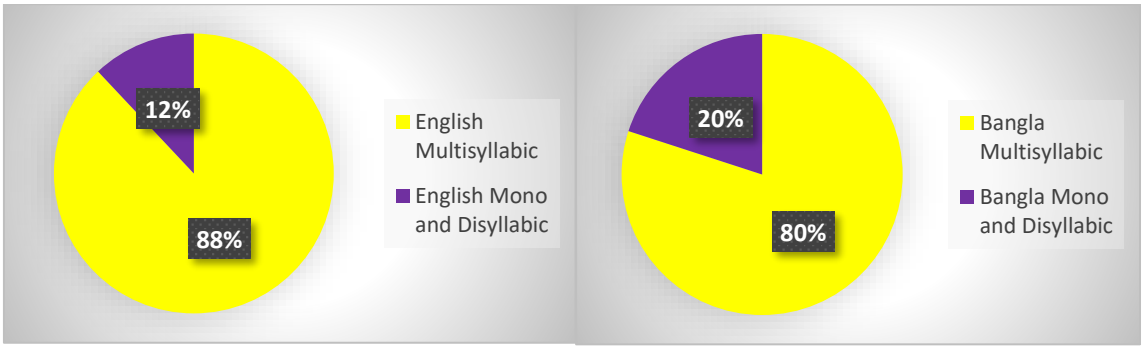


Figure 16 Difficulties in Reading Multisyllabic Words from Bangla and English Language

Difficulties in Reading Sentences

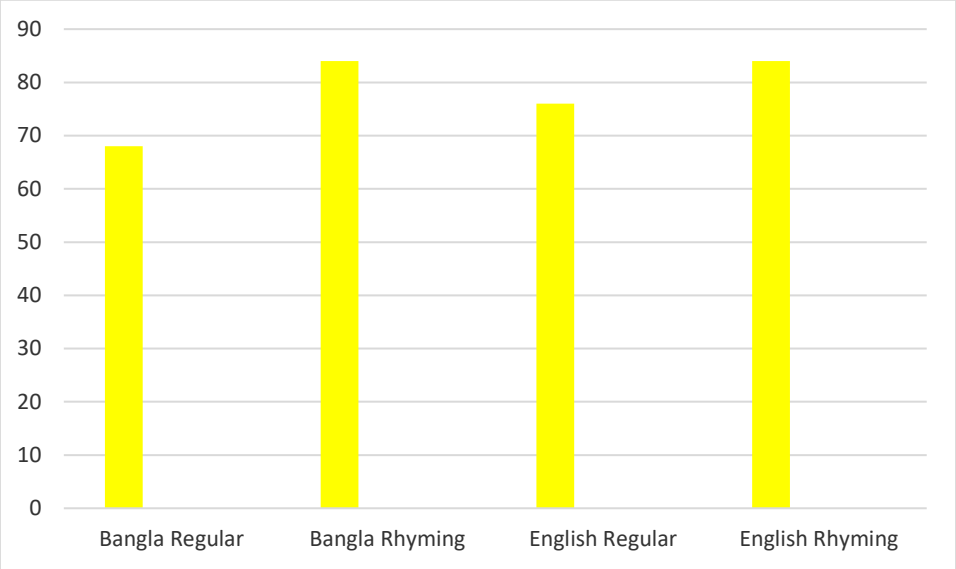


Figure 17 Difficulties in reading sentences

S1 has struggled with nine out of fifty Bengali alphabets, twelve out of twenty-six in English, and twelve out of thirty-four in mathematics, with averages of 18%, 46%, and 35%, respectively.

In comparison, S1 has difficulty with 29 and 34 words out of 50 in Bengali and English, respectively, while the average error rate is 58 percent in Bengali and 68 percent in English. In addition, there were 17 difficulties with the Bengali regular sentences, 21 with the poetry sentences, 19 with the English regular sentences, and 21 with the poetry sentences. Each section includes 25 sentences. Furthermore, S1 has faced difficulties uttering the voiced sounds in both Bangla and English language. In both languages, S1 has misread more than 80 percent voiced sounds while multisyllabic words have a great side for them to face difficulties.

5.3.2 Student 2: Alphabets

Stimuli	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	12	24%
English	26	14	53%
Mathematics	34	10	29%

Student 2: Words

Stimuli	Total words	Difficulties	Disabilities percentage
Bangla	50	31	62%
English	50	37	74%

Student 2: sentences

Stimuli	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	19	76%

Bangla rhyming sentences	25	23	92%
English regular sentences	25	19	76%
English rhyming sentences	25	17	68%

Table 4 Student 1 difficulties in reading, alphabets, words, and sentences

Difficulties in Reading Alphabets and Words

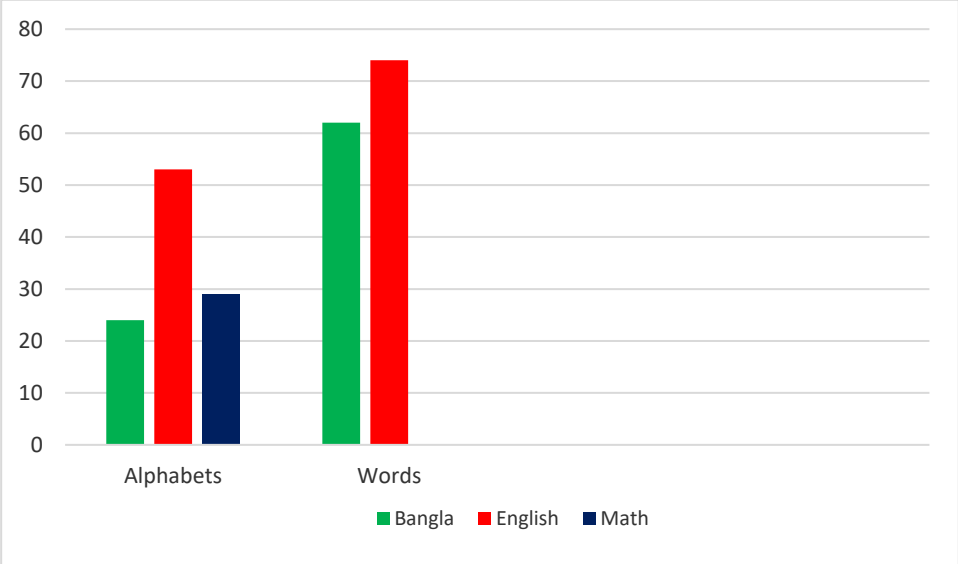


Figure 18 Student 2 difficulties in reading, alphabets, and words

Here, the X-axis represents alphabets and words level whereas, the Y-axis illustrates the percentage.

Difficulties in Reading Voiced and Unvoiced Sounds

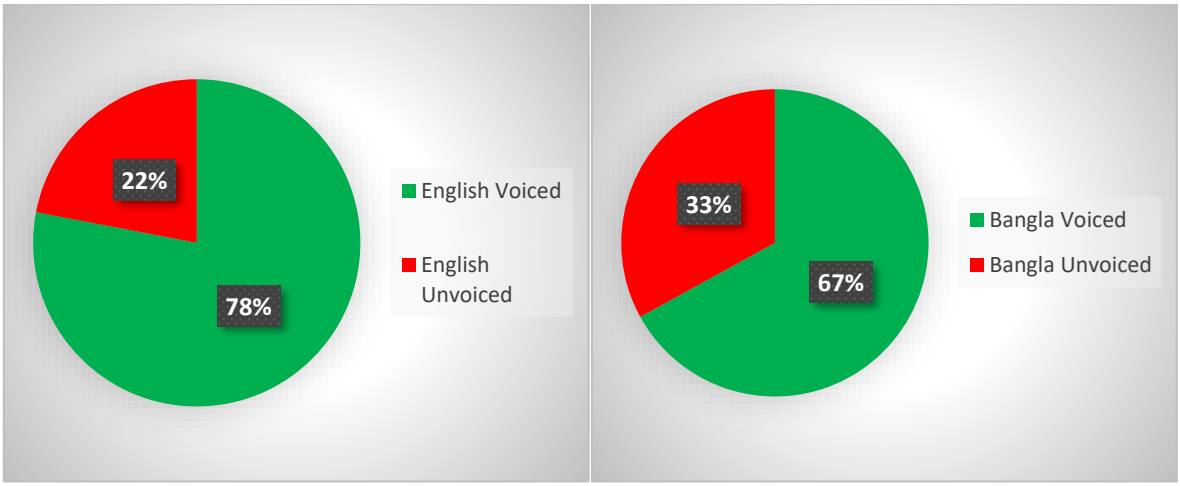


Figure 19 Difficulties in Reading Voiced and Unvoiced Sounds from Bangla and English Language

Difficulties in Multisyllabic Words

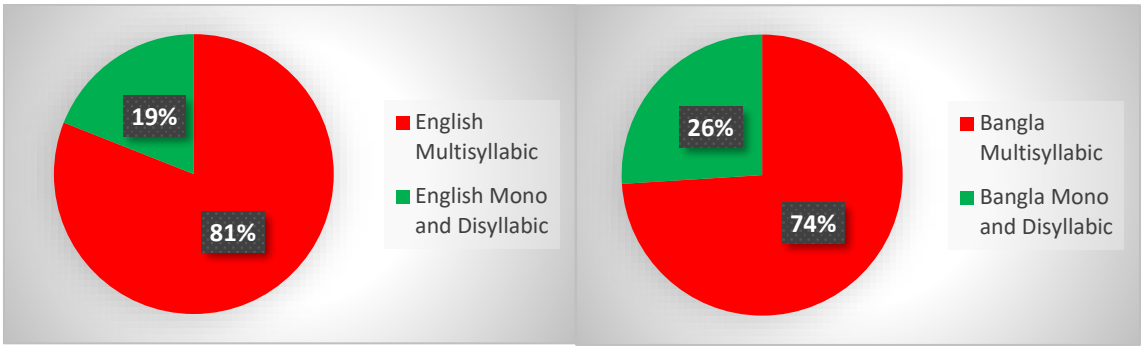


Figure 20 Difficulties in Reading Multisyllabic Words from Bangla and English Language

Difficulties in Reading Sentences

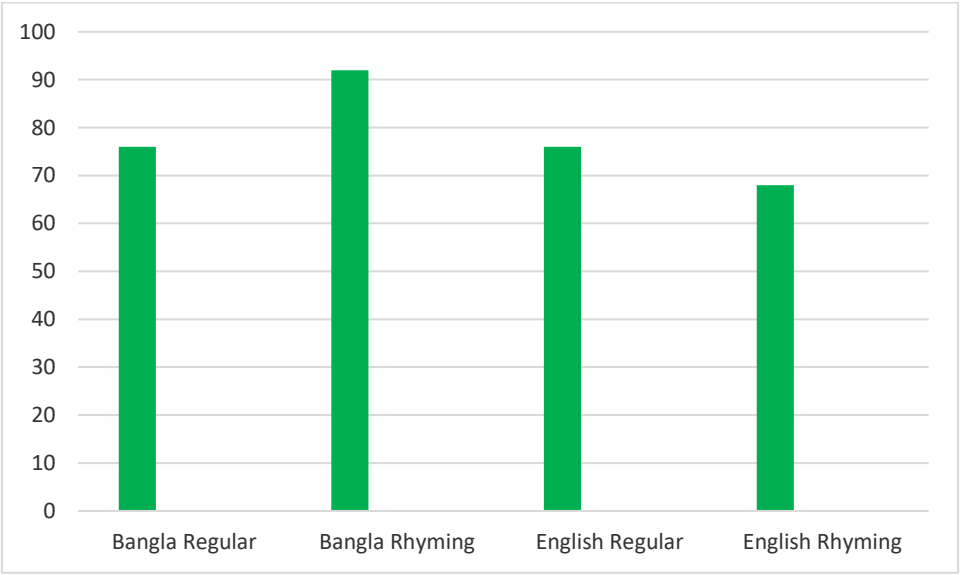


Figure 21 Difficulties in reading sentences

With average scores of 24%, 53%, and 29%, respectively, S2 has difficulty with 12 out of 50 Bengali alphabets, 14 out of 26 English alphabets, and 10 out of 34 math letters and numbers.

While the average error rate in Bengali is 62 percent and in English is 74 percent, S2 has trouble with 31 and 37 words out of 50, respectively. Additionally, there were 23 (92%) problems with Bangla poetry sentences, 19(76%) problems with English regular sentences, 17(68%) problems with poetry sentences, and 19(76%) problems with Bengali regular statements. Each section has 25 sentences. Moreover, S2 has also faced difficulties reading the voiced sounds in both Bangla and English language. S2 has difficulties to read 67 percent voiced sounds in Bangla whereas 78% in English. Then again, multisyllabic words have a great side for them to face difficulties where 78% was misread in Bangla multisyllabic words and 81% in English.

5.3.3 Student 3: Alphabets

Stimuli	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	14	28%
English	26	9	35%

Mathematics	34	9	26%

Student 3: Words

Stimuli	Total words	Difficulties	Disabilities percentage
Bangla	50	18	36%
English	50	27	54%

Student 3: sentences

Stimuli	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	11	44%
Bangla rhyming sentences	25	16	64%
English regular sentences	25	15	60%
English rhyming sentences	25	17	68%

Table 5 Student 3 difficulties in reading, alphabets, words, and sentences

Difficulties in Reading Alphabets and Words

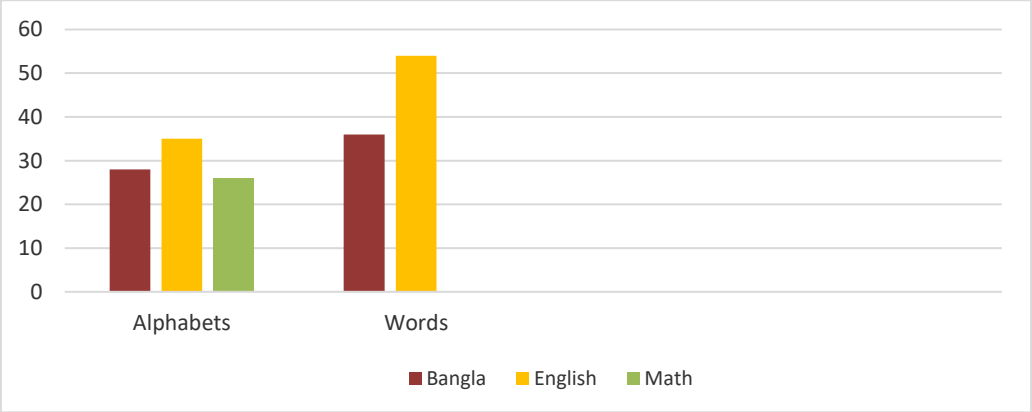


Figure 22 Student 3 difficulties in reading, alphabets, and words

Here, the X-axis represents alphabets and words level whereas, the Y-axis illustrates the percentage.

Difficulties in Reading Voiced and Unvoiced Sounds

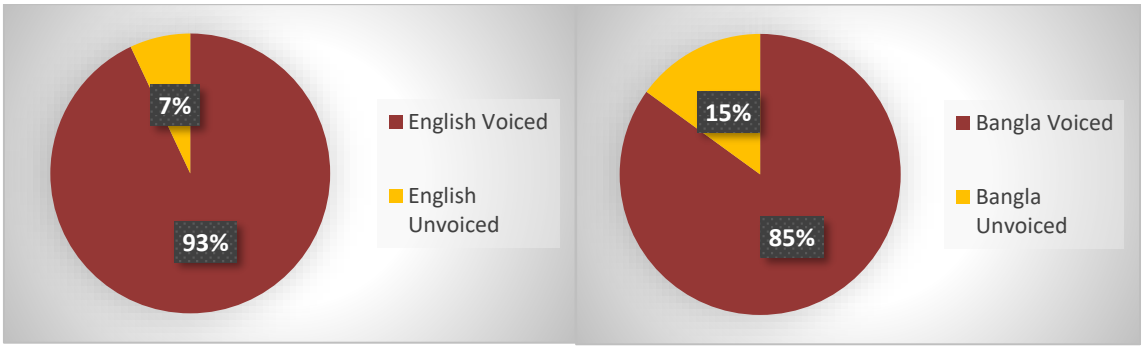


Figure 23 Difficulties in Reading Voiced and Unvoiced Sounds from Bangla and English Language

Difficulties in Multisyllabic Words

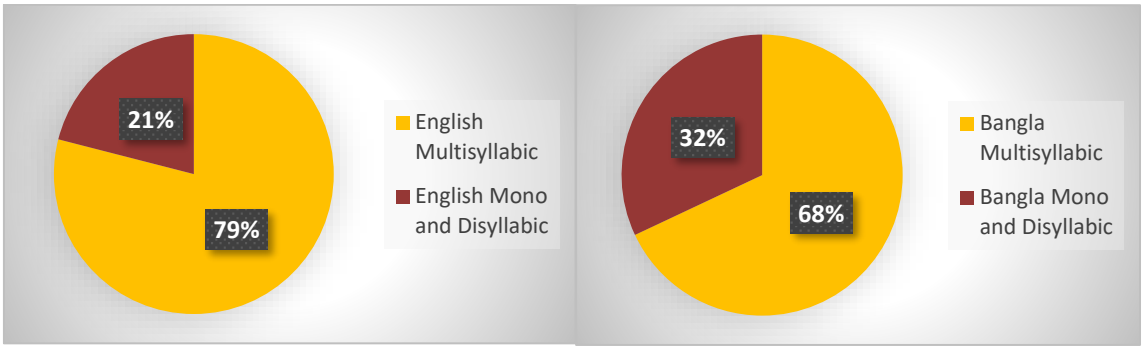


Figure 24 Difficulties in Reading Multisyllabic Words from Bangla and English Language

Difficulties in Reading Sentences

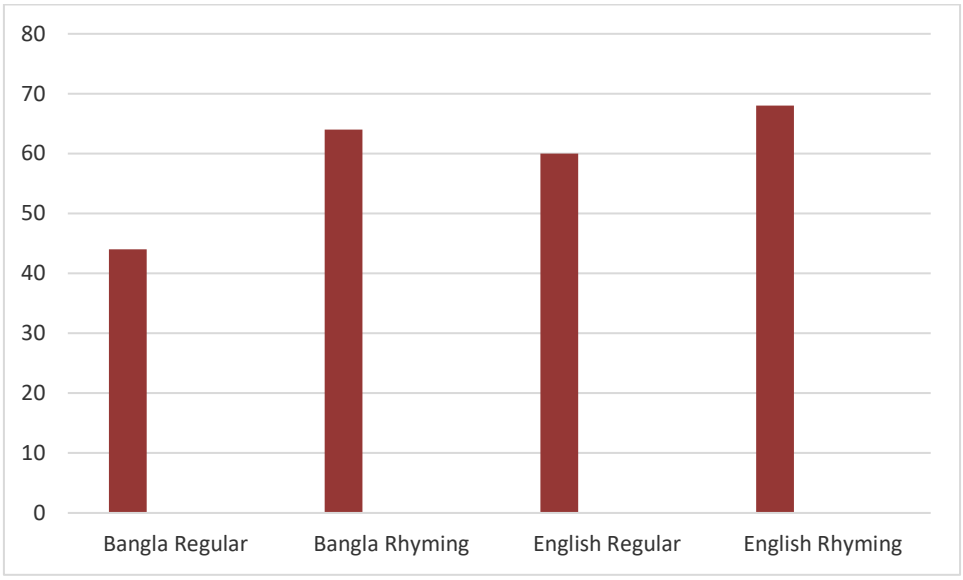


Figure 25 Difficulties in reading sentences

S3 has struggled with 14 out of fifty Bengali alphabets, 9 out of twenty-six in English alphabet and 9 out of thirty-four in mathematics, with averages of 28%, 35%, and 26%, respectively.

In comparison, S2 has difficulty with 18 and 27 words out of 50 in Bengali and English respectively, while the average error rate is 36 percent in Bengali and 54 percent in English. In addition, there were 11(44%) difficulties with the Bengali regular sentences, 16(64%) with the poetry sentences, 15(60%) with the English regular sentences, and 17(68%) with the poetry sentences. Each section includes 25 sentences. Again, S3 has also faced difficulties reading the voiced sounds in both Bangla and English language. To be instance, S3 has difficulties to read 85 percent voiced sounds in Bangla whereas 93% in English. Then again, multisyllabic words have a great side for them to face difficulties where 68% was misread in Bangla multisyllabic words and 79% in English.

5.3.4 Student 4: Alphabets

Stimuli	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	10	20%
English	26	7	27%

Mathematics	34	6	18%

Student 4: Words

Stimuli	Total words	Difficulties	Disabilities percentage
Bangla	50	15	30%
English	50	23	46%

Student 4: sentences

Stimuli	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	9	36%
Bangla rhyming sentences	25	14	56%
English regular sentences	25	19	76%
English rhyming sentences	25	17	68%

Table 6 Student 4 difficulties in reading, alphabets, words, and sentences

Difficulties in Reading Alphabets and Words

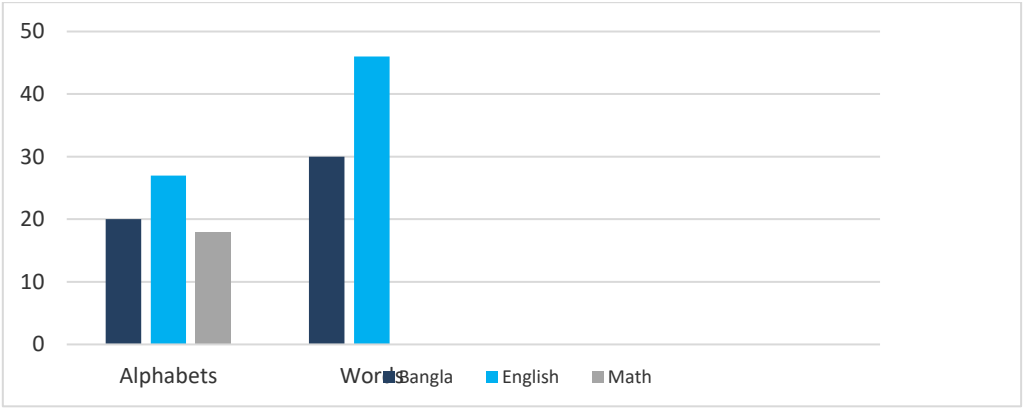


Figure 26 Student 4 difficulties in reading, alphabets, and words

Difficulties in Reading Voiced and Unvoiced Sounds

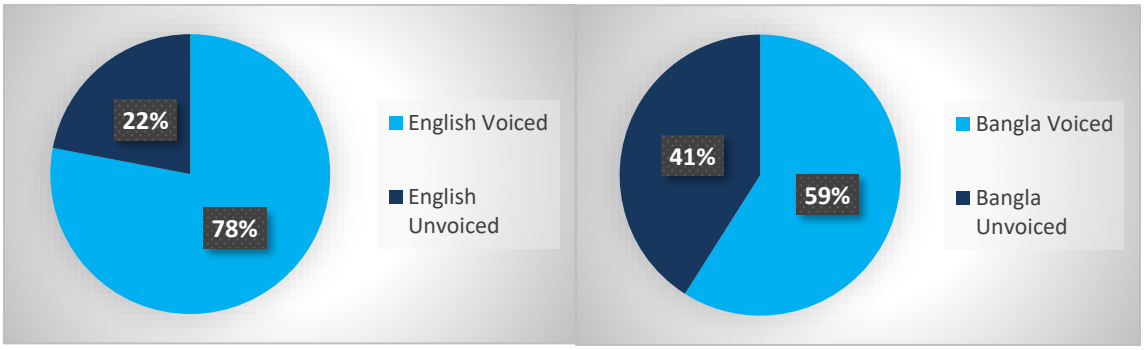


Figure 27 Difficulties in Reading Voiced and Unvoiced Sounds from Bangla and English Language

Difficulties in Multisyllabic Words

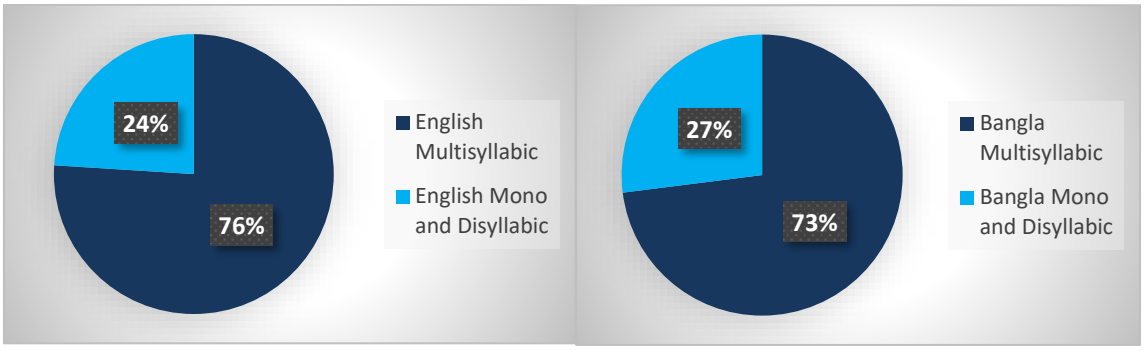


Figure 28 Difficulties in Reading Multisyllabic Words from Bangla and English Language

Difficulties in Reading Sentences

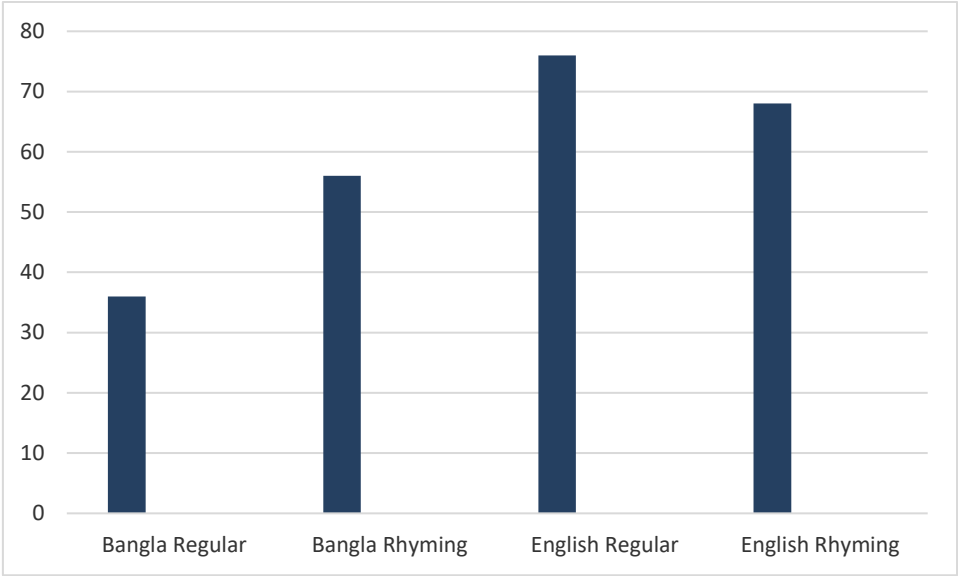


Figure 29 Difficulties in reading sentences

With average scores of 20%, 27%, and 18%, respectively, S4 has difficulty with 10 out of 50 Bengali alphabets, 7 out of 26 English alphabets, and 6 out of 34 math letters and numbers.
While the average error rate in Bengali is 30 percent and in English is 46 percent, S4 has trouble with 15 and 23 words out of 50, respectively. Additionally, there were 9 (36%) problems with Bangla poetry sentences, 14 (56%) problems with English regular sentences, 19 (76%) problems with poetry sentences, and 17(68%) problems with Bengali regular statements. Each section has 25 sentences. Moreover, S4 has also faced difficulties reading the voiced sounds in both Bangla and English language. S4 has difficulties to read 59 percent voiced sounds in Bangla whereas 78% in English. Then again, multisyllabic words have a great side for them to face difficulties where 73% was misread in Bangla multisyllabic words and 76% in English language.

5.3.5 Student 5: Alphabets

Stimuli	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	12	24%

English	26	8	31%
Mathematics	34	15	44%

Student 5: Words

Stimuli	Total words	Difficulties	Disabilities percentage
Bangla	50	14	28%
English	50	23	46%

Student 5: sentences

Stimuli	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	10	40%
Bangla rhyming sentences	25	14	56%
English regular sentences	25	12	48%
English rhyming sentences	25	19	76%

Table 7 Student 5 difficulties in reading, alphabets, words, and sentences

Difficulties in Reading Alphabets and Words

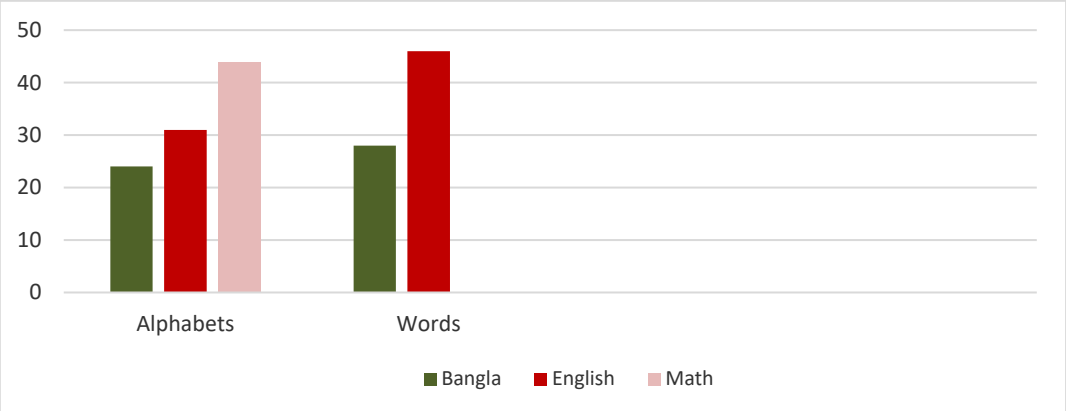


Figure 30 Student 4 difficulties in reading, alphabets, and words

Difficulties in Reading Voiced and Unvoiced Sounds

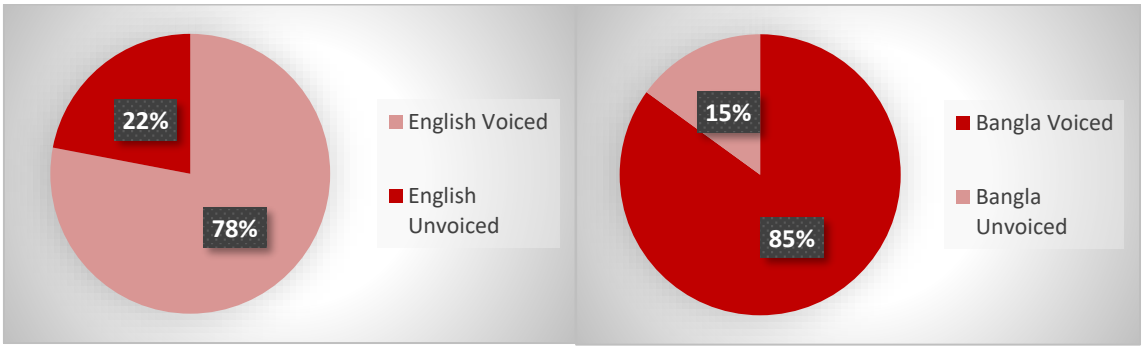


Figure 31 Difficulties in Reading Voiced and Unvoiced Sounds from Bangla and English Language

Difficulties in Multisyllabic Words

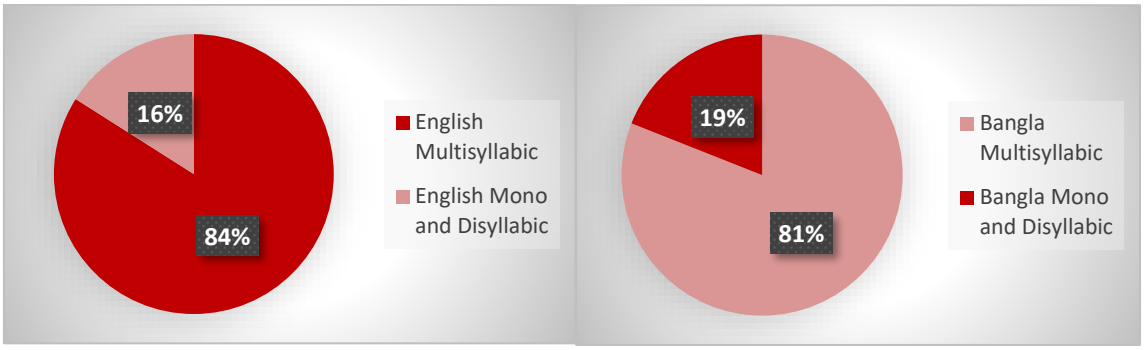
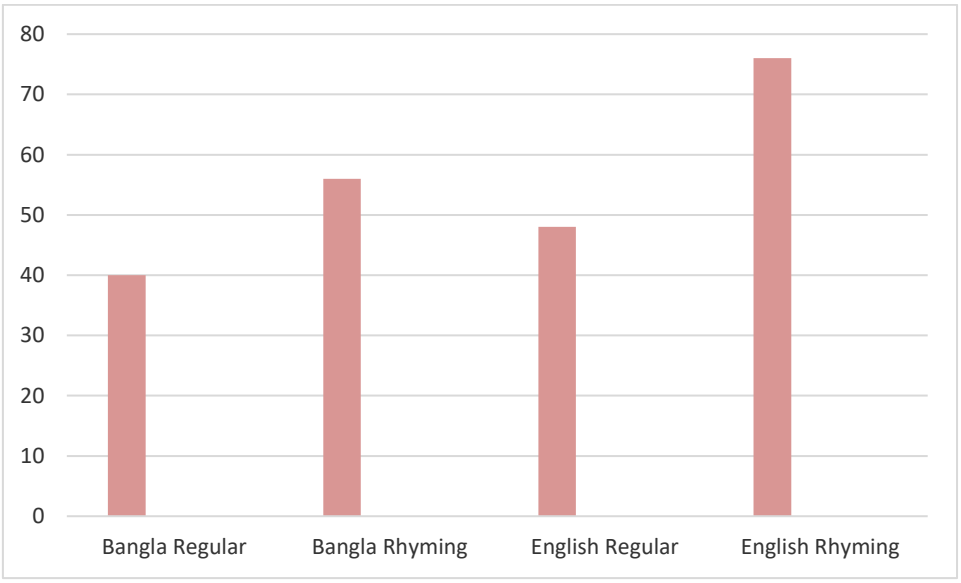


Figure 32 Difficulties in Reading Multisyllabic Words from Bangla and English Language

Difficulties in Reading Sentences

Figure 33 Difficulties in reading sentences



With average scores of 24%, 31%, and 44%, respectively, S5 has difficulty with 12 out of 50 Bengali alphabets, 8 out of 26 English alphabets, and 15 out of 34 math symbols and numbers.

While the average error rate in Bengali is 28 percent and in English is 46 percent, S5 has trouble with 14 and 23 words out of 50, respectively. Additionally, there were 10 (40%) problems with Bangla poetry sentences, 14(56%) problems with English regular sentences, 12(48%) problems with poetry sentences, and 19(76%) problems with Bengali regular statements. Each section has 25 sentences. Moreover, S5 has also faced difficulties reading the voiced sounds in both Bangla and English language. S5 has difficulties to read 85 percent voiced sounds in Bangla whereas 78% in English. Then again, multisyllabic words have a great side for them to face difficulties where 81% was misread in Bangla multisyllabic words and 84% in English.

In this research, all the factors considered as difficulties are discussed in the dyslexia types and characteristics section in the theoretical background.

5.4 After Using Mobile Assisted Language Learning Tools

After using Mobile Assisted Language learning tools, improvement in every component can be observed in children. To prove their development, first they are again given completely new 100 words and 100

sentences and 100 letters with clusters either from their text book or outside of their text book. The development observed in them after this is as follows:

5.4.1 Student 1: Alphabets

Subject	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	1	2%
English	26	2	7%
Mathematics	34	4	9%

Student 1: Words

Subjects	Total words	Difficulties	Disabilities percentage
Bangla	50	9	18%
English	50	10	20%

Student 1: sentences

Subjects	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	6	24%
Bangla rhyming sentences	25	8	32%
English regular sentences	25	5	20%
English rhyming sentences	25	9	36%

Table 8 Student 1 difficulties in reading, alphabets, words, and sentences

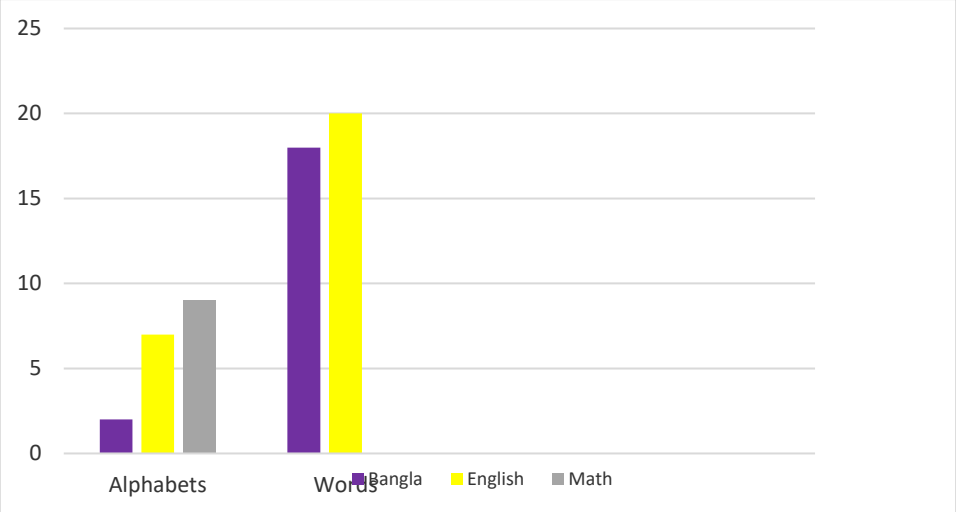


Figure 34 Student 1 difficulties in reading, alphabets, and words

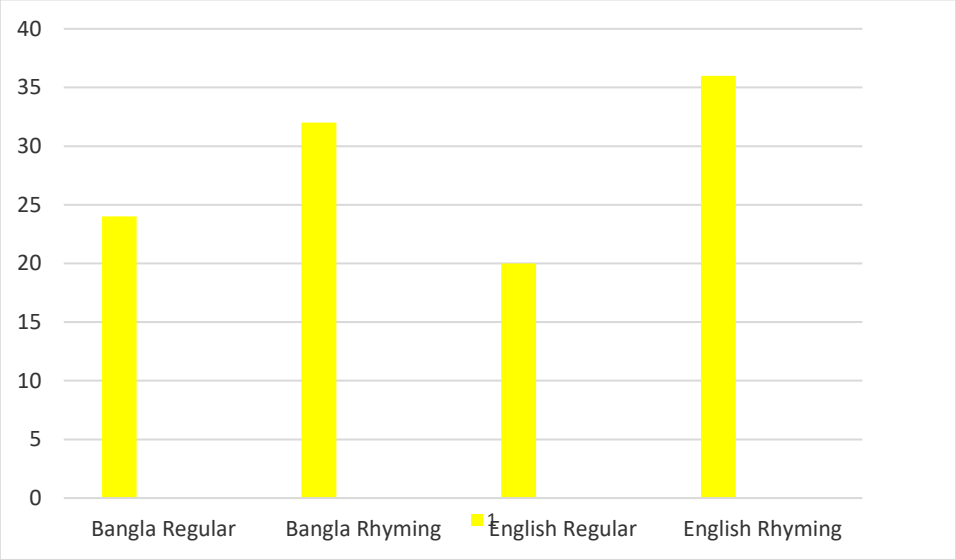


Figure 35 Difficulties in reading sentences

5.4.2 Student 2: Alphabets

Subject	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	0	0%
English	26	1	4%
Mathematics	34	5	15%

Student 2: Words

Subjects	Total words	Difficulties	Disabilities percentage
Bangla	50	4	8%
English	50	7	14%

Student 2: sentences

Subjects	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	6	24%
Bangla rhyming sentences	25	9	36%
English regular sentences	25	8	32%
English rhyming sentences	25	11	44%

Table 9 Student 2 difficulties in reading, alphabets, words, and sentences

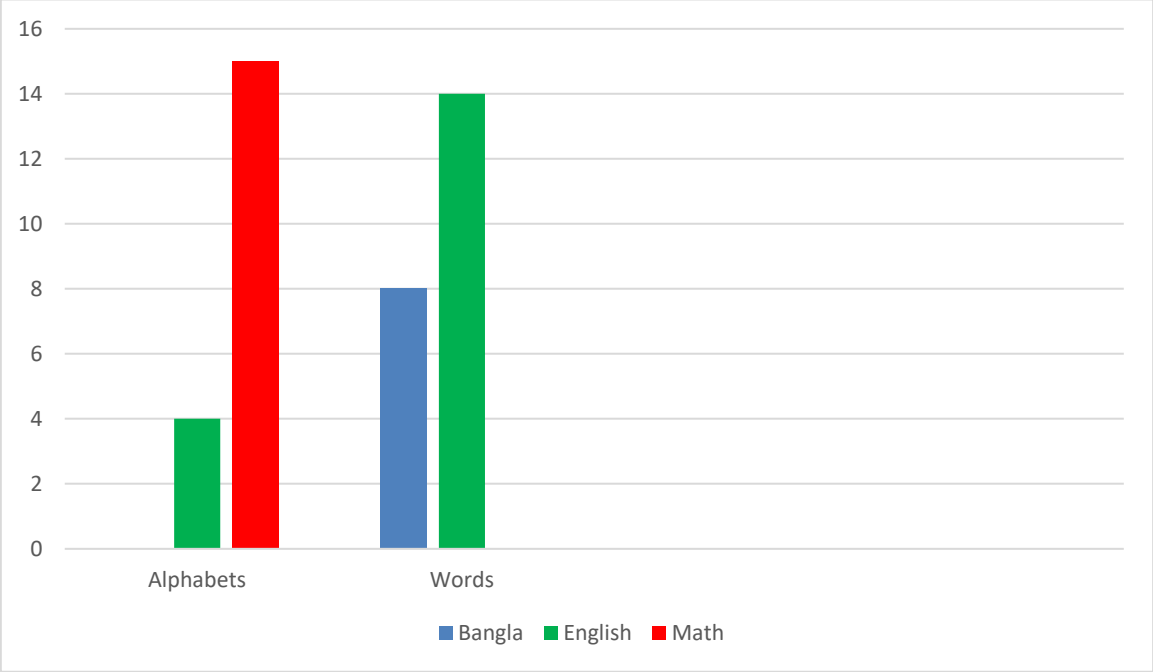


Figure 36 Student 2 difficulties in reading, alphabets, and words

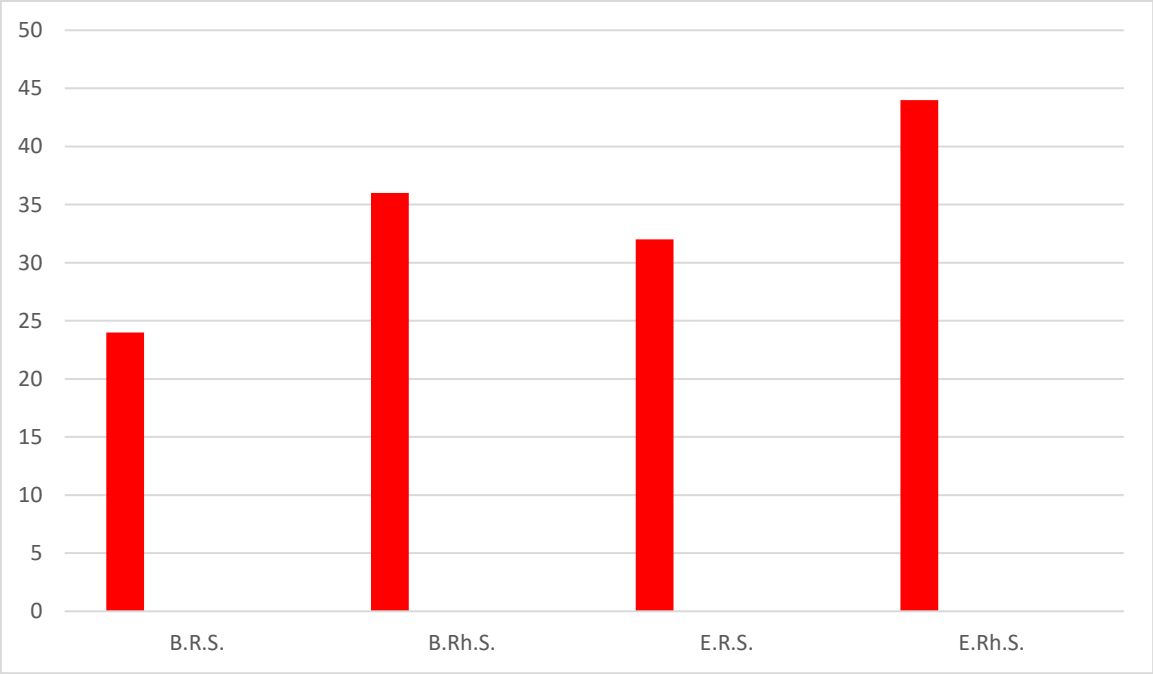


Figure 37 Difficulties in reading sentences

5.4.3 Student 3: Alphabets

Subject	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	1	2%
English	26	3	11%
Mathematics	34	0	0%

Student 3: Words

Subjects	Total words	Difficulties	Disabilities percentage
Bangla	50	5	10%
English	50	8	16%

Student 3: sentences

Subjects	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	4	16%
Bangla rhyming sentences	25	5	20%
English regular sentences	25	8	32%
English rhyming sentences	25	13	52%

Table 10 Student 3 difficulties in reading, alphabets, words, and sentences

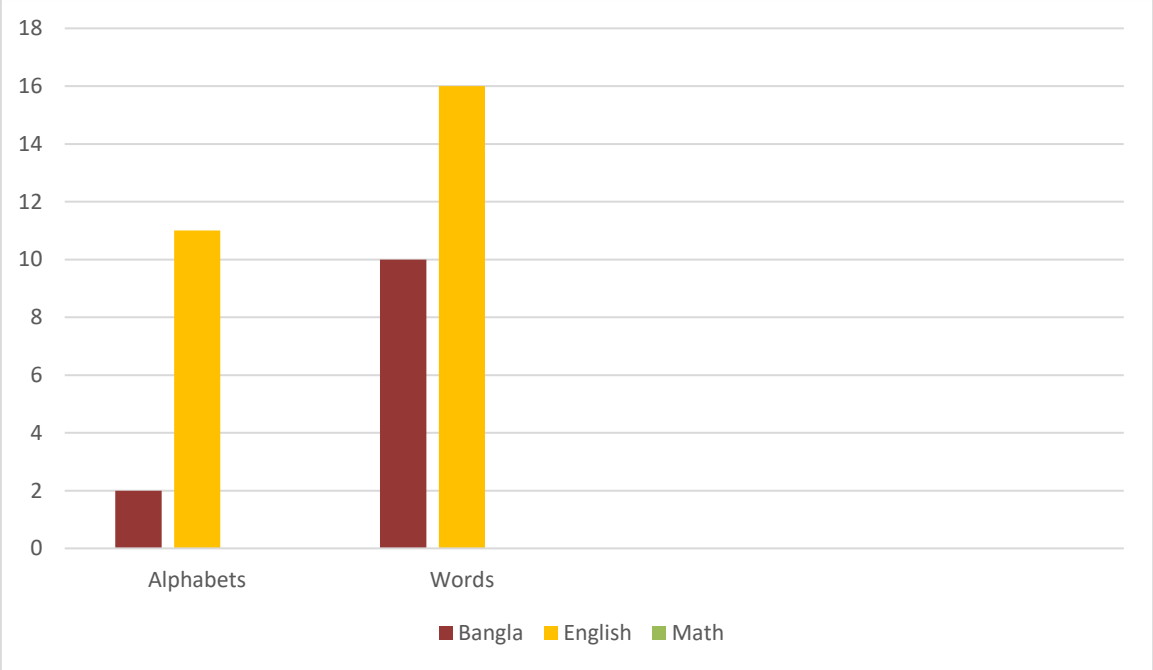


Figure 38 Student 3 difficulties in reading, alphabets, and words

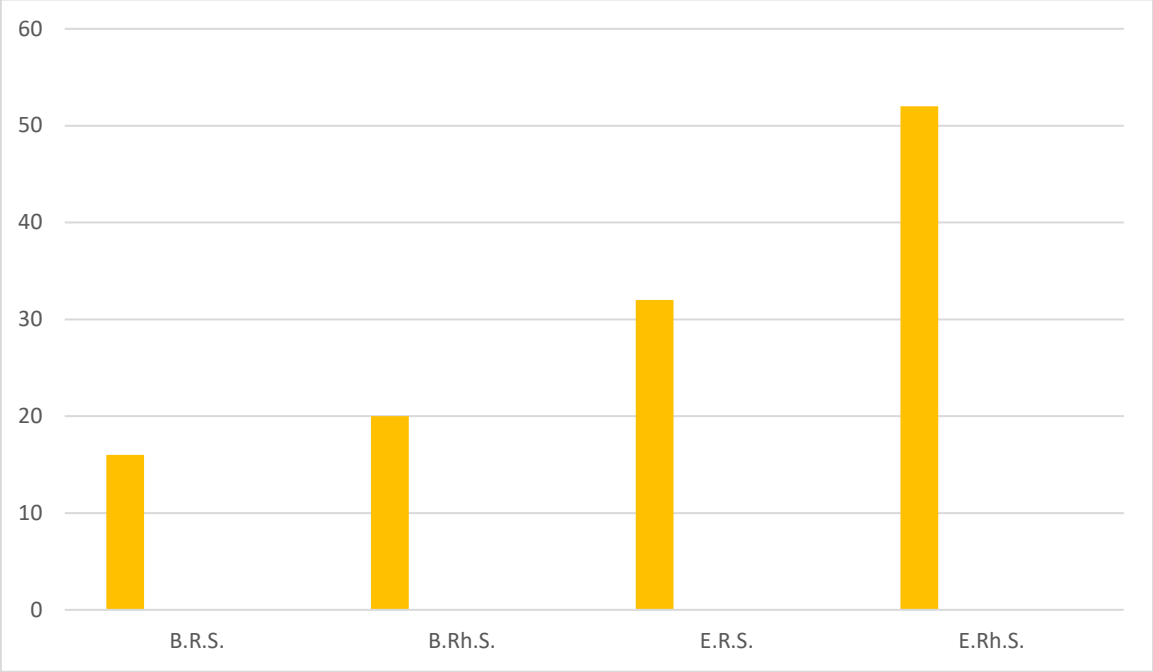


Figure 39 Difficulties in reading sentences

5.4.4 Student 4: Alphabets

Subject	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	3	6%
English	26	1	3%
Mathematics	34	2	5%

Student 4: Words

Subjects	Total words	Difficulties	Disabilities percentage
Bangla	50	4	8%
English	50	7	14%

Student 4: sentences

Subjects	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	3	12%
Bangla rhyming sentences	25	7	28%
English regular sentences	25	6	24%
English rhyming sentences	25	8	32%

Table 11 Student 4 difficulties in reading, alphabets, words, and sentences

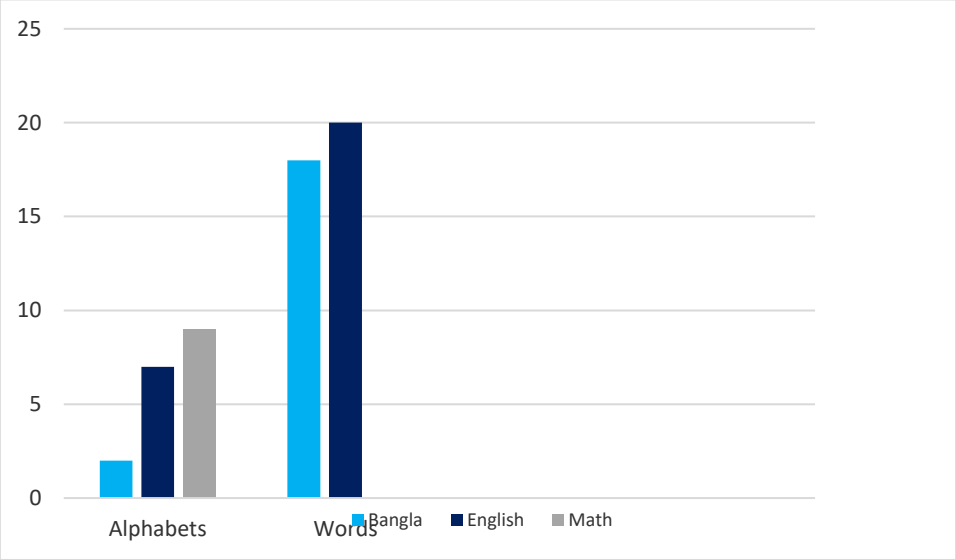


Figure 40 Student 4 difficulties in reading, alphabets, and words

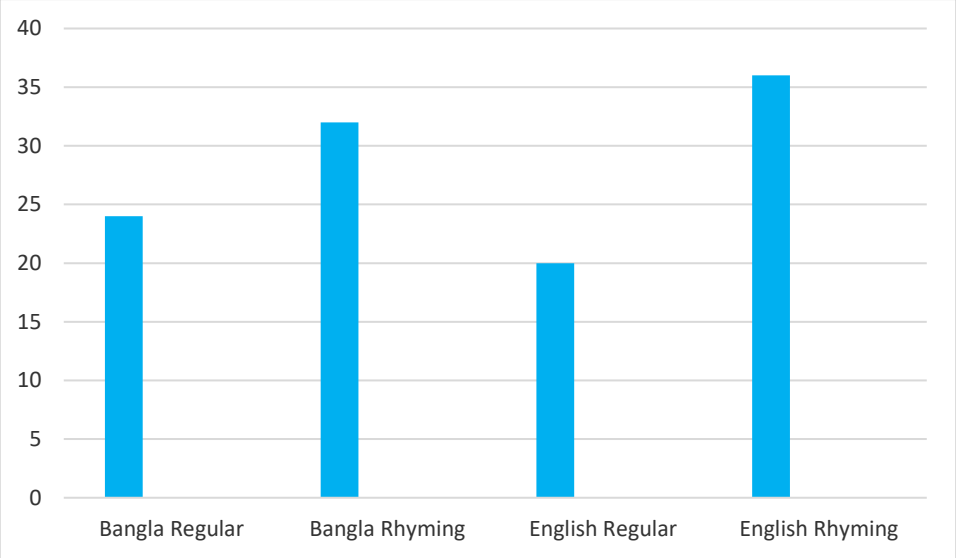


Figure 41 Difficulties in reading sentences

5.4.5 Student 5: Alphabets

Subject	Total alphabet	Difficulties	Difficulties percentage
Bangla	50	1	2%
English	26	4	15%
Mathematics	34	2	5%

Student 5: Words

Subjects	Total words	Difficulties	Disabilities percentage
Bangla	50	7	14%
English	50	9	18%

Student 5: sentences

Subjects	Total sentences	Disabilities	Disabilities percentage
Bangla regular sentences	25	3	12%
Bangla rhyming sentences	25	7	28%
English regular sentences	25	9	36%
English rhyming sentences	25	11	44%

Table 12 Student 5 difficulties in reading, alphabets, words, and sentences

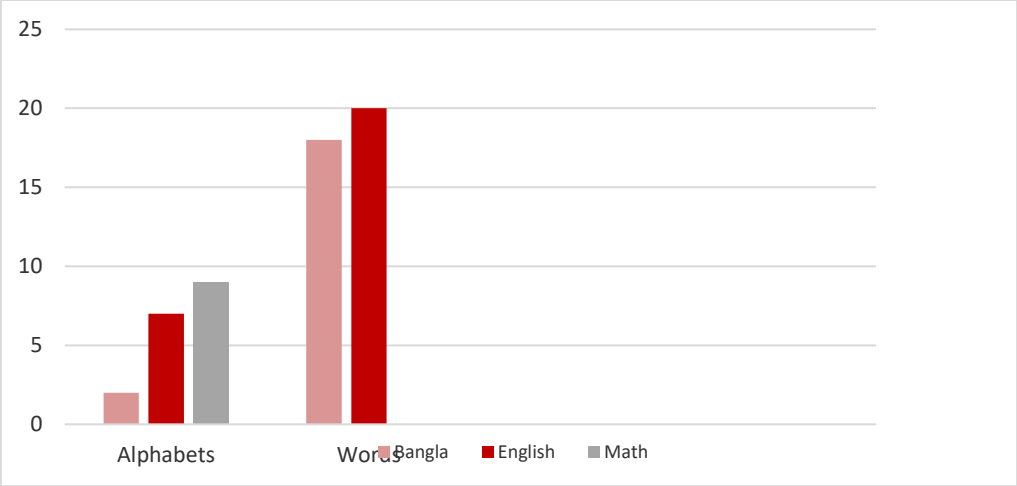


Figure 42 Student 5 difficulties in reading, alphabets, and words

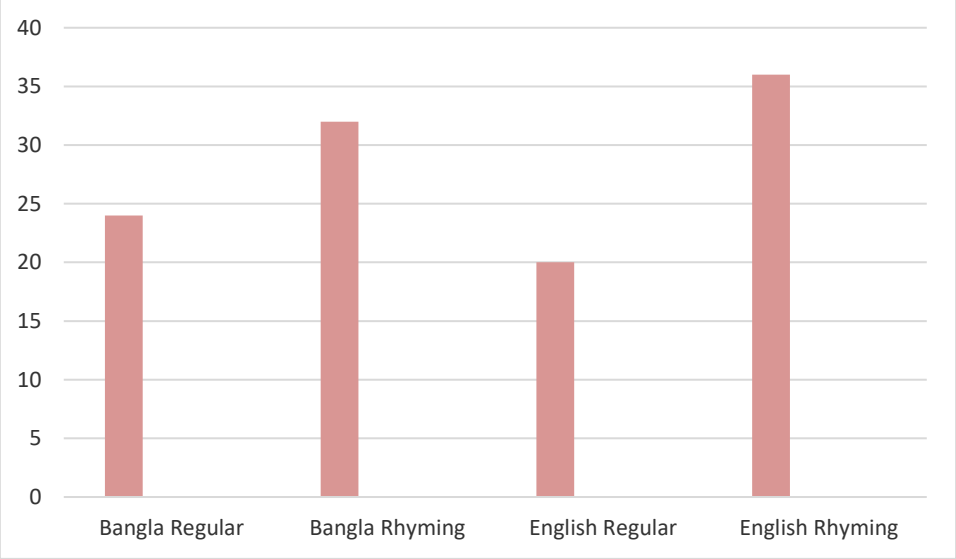


Figure 43 Difficulties in reading sentences

In the second phase, they have given some irregular stimuli including consonant clusters and diphthongs to read. They have still faced difficulties to read properly of these irregular stimuli though the rate is

much less than before. It is possible to improve each and every level of reading elements by using Mobile Assisted Language Learning Tools as we can clearly notice from the above tables, figures and diagrams.

CHAPTER SIX: FINDINGS AND DISCUSSION

6.1 Comparison

6.1.1 Student1:

Stimuli	Reading Difficulties before using MALL tools	Reading Difficulties after using MALL tools
Bangla alphabets	18%	2%
English alphabets	46%	7%
Mathematical numbers	35%	9%
Bangla words	58%	18%
English words	68%	20%
Bangla regular sentences	68%	24%
Bangla rhyming sentences	84%	32%
English regular sentences	76%	20%
English rhyming sentences	84%	36%

Table 13 Improving comparison of S1 in different linguistic elements

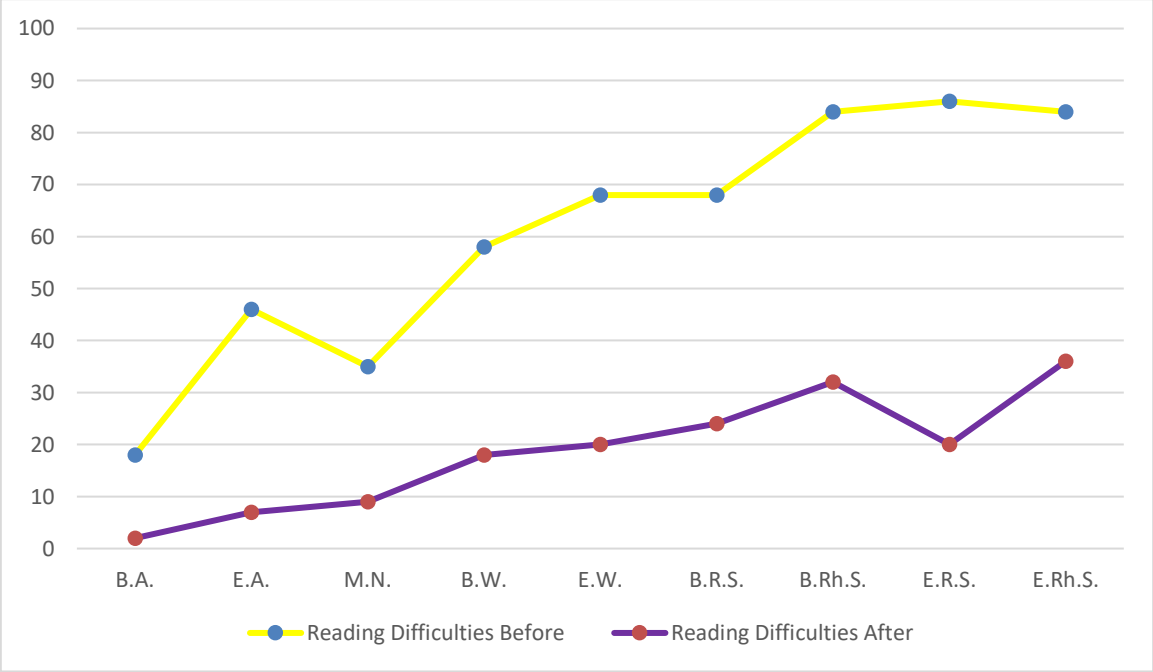


Figure 44 Improving comparison of S1 in different linguistic elements

6.1.2 Student 2

Stimuli	Reading Difficulties before using MALL tools	Reading Difficulties after using MALL tools
Bangla alphabets	24%	0%
English alphabets	53%	4%
Mathematical numbers	29%	15%
Bangla words	62%	8%
English words	74%	14%
Bangla regular sentences	76%	24%
Bangla rhyming sentences	92%	36%
English regular sentences	76%	24%
English rhyming sentences	68%	44%

Table 14 Improving comparison of S2 in different linguistic elements

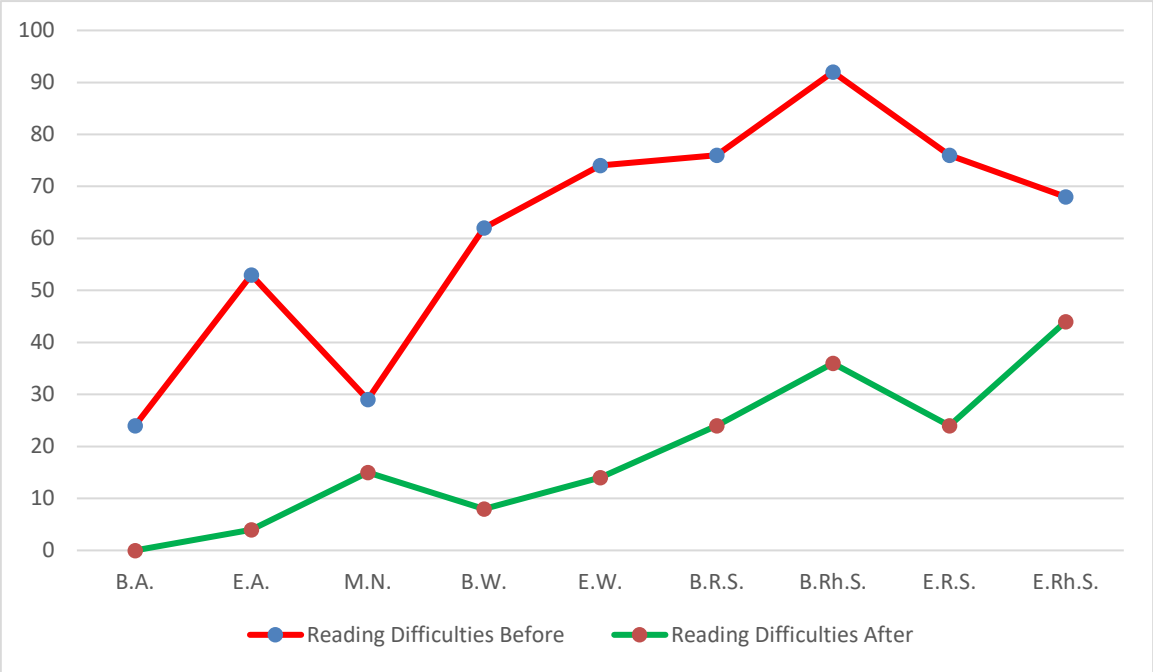


Figure 45 Improving comparison of S2 in different linguistic elements

6.1.3 Student 3

Stimuli	Reading Difficulties before using MALL tools	Reading Difficulties after using MALL tools
Bangla alphabets	28%	2%
English alphabets	35%	11%
Mathematical numbers	26%	0%
Bangla words	36%	10%
English words	54%	16%
Bangla regular sentences	44%	16%

Bangla rhyming sentences	64%	20%
English regular sentences	60%	32%
English rhyming sentences	68%	52%

Table 15 Improving comparison of S3 in different linguistic elements

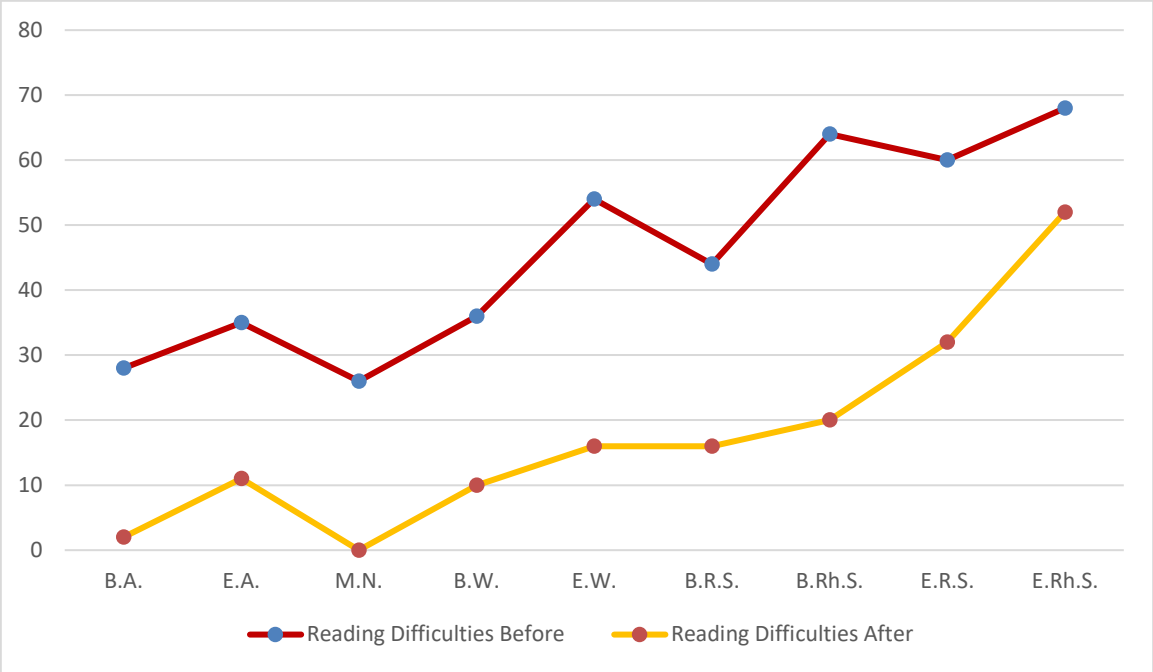


Figure 46 Improving comparison of S3 in different linguistic elements

6.1.4 Student 4

Stimuli	Reading Difficulties before using MALL tools	Reading Difficulties after using MALL tools
Bangla alphabets	20%	6%
English alphabets	27%	3%
Mathematical numbers	28%	5%
Bangla words	30%	8%
English words	46%	14%
Bangla regular sentences	36%	13%
Bangla rhyming sentences	56%	28%
English regular sentences	76%	24%
English rhyming sentences	68%	32%

Table 16 Improving comparison of S4 in different linguistic elements

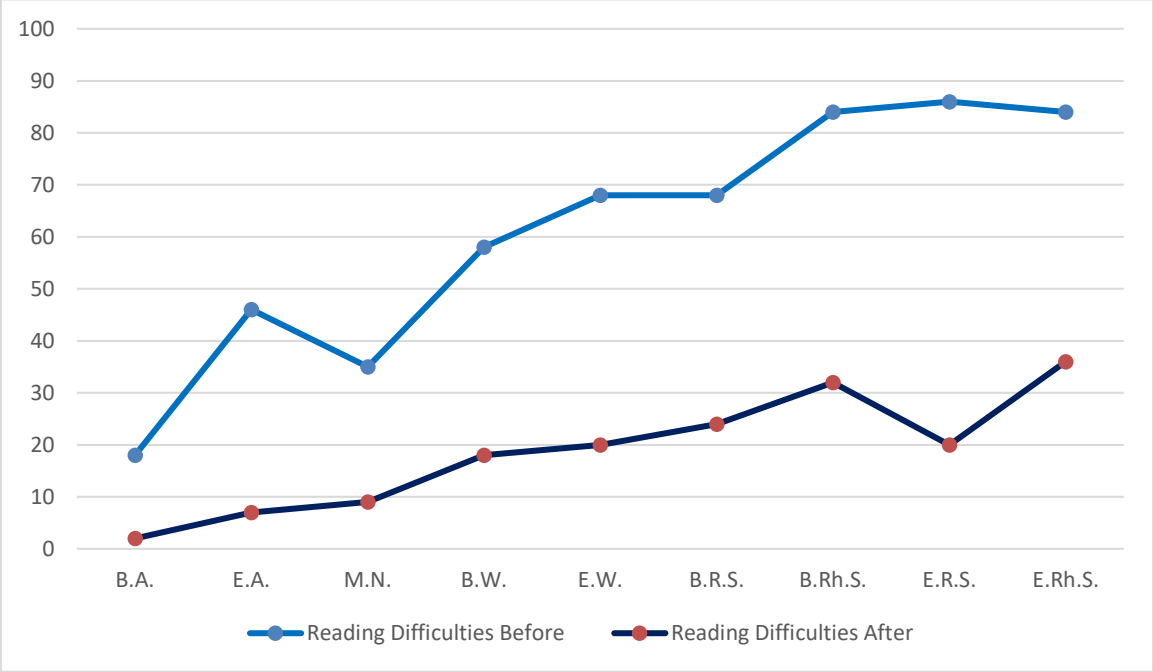


Figure 47 Improving comparison of S4 in different linguistic elements

6.1.5 Student 5

Stimuli	Reading Difficulties before using MALL tools	Reading Difficulties after using MALL tools
Bangla alphabets	24%	2%
English alphabets	31%	15%
Mathematical numbers	44%	5%
Bangla words	28%	14%
English words	46%	18%
Bangla regular sentences	40%	12%
Bangla rhyming sentences	56%	28%
English regular sentences	48%	36%
English rhyming sentences	76%	44%

Table 17 Improving comparison of S5 in different linguistic elements

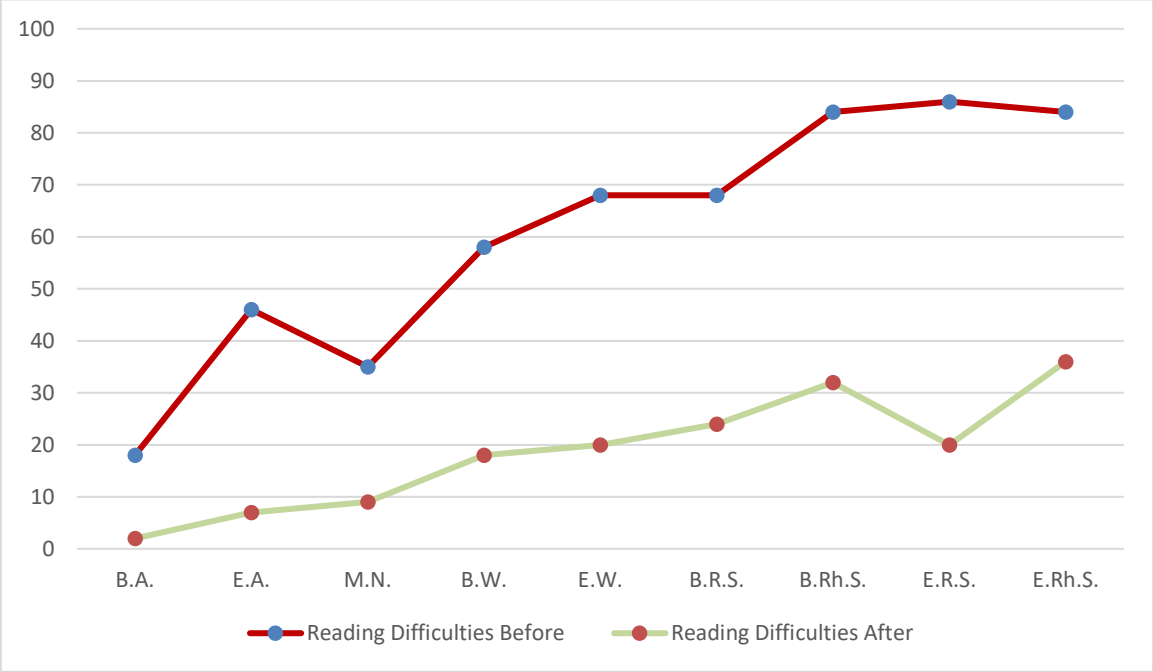


Figure 48 Improving comparison of S5 in different linguistic elements

It could be clearly seen from the above comparison diagrams and tables that every child has shown their improvement in all the sectors. Despite having the improvement, still they have faced difficulties uttering the rhyming sentences those are not in regular syntactic structure. If it is possible to provide them enough time to practice, there is certainly has more chance to improve more in those sections. On the other hand, the most improvements have been observed in the phonological level whereas morphology is fur behind. Even though they have shown more improvements in these two sectors, still they have some troubles to utter the voiced and multisyllabic word accurately.

Then, their school performance is observed which again feedback is taken through those 4 teachers. Then again, information is taken from the children's families where they mention the overall development of their children. Finally, feedback is also taken from children about their feelings.

6.2 Teachers' feedback

Teacher1 mentioned that, *"We are a bit surprised. These children now come to school regularly. Earlier, they did not ask questions in class. Now they ask questions in class always. If they asked to read the reading, they would say they can't. But now, they want to read by their own interests."*

Teacher2 states that,*" Look, I think their parents gave them home tuition. Otherwise, they would not have suddenly learned to read. But anyway, we are happy that they come to school every day now."*

Teacher3 thinks that,*" Earlier, their friends used to make fun of them because they couldn't read in class, but now they try to read every day and they are more interested in reading than before and their reading speed has also increased a lot compared to before."*

Teacher4 opined that, *"Before, they were very afraid in the class because they could not read properly. Now, they try to read out even if they made a mistake. Even, if homework is given, they have done properly."*

6.2.1 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 1

The major opinions from the teacher's data have shown in the following tables.

	Always	Sometimes	Never	Few
Spelling Difficulties	Yes			
Reading Difficulties	Yes			
Letter Identifying Difficulties		Yes		
Numerical Difficulties		Yes		
Capital-Small letter confusion				Yes
Feelings of Carrier			Yes	
Attentive at class				Yes

Table 18 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 1

6.2.2 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 2

	Always	Sometimes	Never	Few
Spelling Difficulties		Yes		
Reading Difficulties	Yes			
Letter Identifying Difficulties				Yes
Numerical Difficulties		Yes		
Capital-Small letter confusion		Yes		
Feelings of Carrier				Yes
Attentive at class			Yes	

Table 19 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 2

6.2.3 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 3

	Always	Sometimes	Never	Few
Spelling Difficulties				Yes
Reading Difficulties	Yes			
Letter Identifying Difficulties	Yes			
Numerical Difficulties	Yes			
Capital-Small letter confusion		Yes		
Feelings of Carrier			Yes	
Attentive at class		Yes		

Table 20 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 3

6.2.4 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 4

	Always	Sometimes	Never	Few
Spelling Difficulties	Yes			
Reading Difficulties	Yes			
Letter Identifying Difficulties		Yes		
Numerical Difficulties		Yes		
Capital-Small letter confusion				Yes
Feelings of Carrier			Yes	
Attentive at class				Yes

Table 21 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 4

6.2.5 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 5

	Always	Sometimes	Never	Few
Spelling Difficulties	Yes			
Reading Difficulties	Yes			
Letter Identifying Difficulties		Yes		
Numerical Difficulties		Yes		
Capital-Small letter confusion				Yes
Feelings of Carrier			Yes	
Attentive at class				Yes

Table 22 Teachers' opinions Before Using Mobile Assisted Language Learning Tools for Student 5

6.2.6 Teachers' opinions After using Mobile Assisted Language Learning Tools for Student 1

	Always	Sometimes	Never	Few
Spelling Difficulties				**Yes**
Reading Difficulties				**Yes**
Letter Identifying Difficulties			**Yes**	
Numerical Difficulties				**Yes**
Capital-Small letter confusion			**Yes**	
Feelings of Carrier		**Yes**		
Attentive at class	**Yes**			

Table 23 Teachers' opinions after Using Mobile Assisted Language Learning Tools for Student 1

6.2.7 Teachers' opinions After using Mobile Assisted Language Learning Tools for Student 2

	Always	Sometimes	Never	Few
Spelling Difficulties				**Yes**
Reading Difficulties				**Yes**
Letter Identifying Difficulties			**Yes**	
Numerical Difficulties			**Yes**	
Capital-Small letter confusion			**Yes**	
Feelings of Carrier	**Yes**			
Attentive at class	**Yes**			

Table 24 Teachers' opinions after Using Mobile Assisted Language Learning Tools for Student 2

6.2.8 Teachers' opinions After using Mobile Assisted Language Learning Tools for Student 3

	Always	Sometimes	Never	Few
Spelling Difficulties			**Yes**	
Reading Difficulties				**Yes**
Letter Identifying Difficulties				**Yes**
Numerical Difficulties				**Yes**
Capital-Small letter confusion			**Yes**	
Feelings of Carrier		**Yes**		
Attentive at class	**Yes**			

Table 25 Teachers' opinions after Using Mobile Assisted Language Learning Tools for Student 3

6.2.9 Teachers' opinions After using Mobile Assisted Language Learning Tools for Student 4

	Always	Sometimes	Never	Few
Spelling Difficulties				**Yes**
Reading Difficulties				**Yes**
Letter Identifying Difficulties			**Yes**	
Numerical Difficulties				**Yes**
Capital-Small letter confusion			**Yes**	
Feelings of Carrier		**Yes**		
Attentive at class	**Yes**			

Table 26 Teachers' opinions after Using Mobile Assisted Language Learning Tools for Student 4

6.2.10 Teachers' opinions After using Mobile Assisted Language Learning Tools for Student 5

	Always	Sometimes	Never	Few
Spelling Difficulties				**Yes**
Reading Difficulties				**Yes**
Letter Identifying Difficulties			**Yes**	
Numerical Difficulties				**Yes**
Capital-Small letter confusion			**Yes**	
Feelings of Carrier		**Yes**		
Attentive at class	**Yes**			

Table 27 Teachers' opinions after Using Mobile Assisted Language Learning Tools for Student 5

It is clearly noticed from the tables where the teachers have given their opinions that all the children are now more regular than previous. They have now enriched their carrier knowledge along with class

activities. Capital letter identification is now completely fine whereas they have faced more difficulties to identify them in before. However, the rest of the problems are still remaining few. The reason for this is that this study was not conducted with a longer period of time.

6.3 Parents feedback

P1 mentioned that, *"Now, my son looks more enthusiastic than before in terms of learning. He himself tells us that he used to make mistakes in many things that we didn't even know about. But he has been spending a bit more time on mobile though he is using it for learning. But we want him to do more better in future."*

P2 opined that, *" My daughter herself told us that she needs no longer tuition. When we asked her why, she said, she can read better now and what the tuition teacher used to teach, he can learn better on mobile now. Earlier we scolded her for going to school but now she is interested in going to school on his own freewill."*

P3 told that, *"To be honest, we were very scared and skeptical in the beginning. In fact, we were not interested in the whole processing. But now it seems that the use of mobile learning is very simple in which we can help our child to learn easily too."*

P4 thinks that, *"My child is now tries to concentrate more on study. I can not help thanking the researcher though in the beginning, I misunderstood about the activities. I thought, the researcher has come with a general goal and will go after one or two days. It was really surprise me to the effort the researcher put on my child. I am so happy now and I will help my child what the researcher had installed in our phone."*

P5 mentioned that, *"I was afraid initially when the researcher regularly came to our house. In the very beginning, I was not agreed to allow the researcher to come into our house regularly but when the headteacher of school assured us only then we allow the researcher. But now, we realized that the researcher had had a good impact to improve my child's reading. I still do not understand the term dyslexia what the researcher mentioned but it is true that the improvement is obviously there."*

6.4 Students Feedbacks

Student 1 *" I was instigated by my school friends because I was unable to read fluently. My teachers have told me that I am not serious in my studies but I tried hard at home. I didn't find any enthusiastic support from my parents. But, after using the applications in our mobile phone, I have got an excellent environment. I can learn whenever I want. I can hear a word several times. No one can tell me why you are hearing a word many times. I can also practice with many examples that help me to make the mistakes less now."*

Student 2 *" I* didn't *like going school regular because I don't have any good friend. Everybody called me as a bad student because I was unable to do my homework. I have many problems. I didn't read as quick as my friends do. I made many mistakes during writing. Teachers blame for watching TV but I didn't watch TV much rather I like playing with my cousins. They live near to our house. After using the methods that this sir(researcher)has shown me, I felt more encouragement. Every day, when this sir (researcher) left after guiding me, I call my cousins and play letter games and word games. Now, I am able to read though I am not fluent enough but I will overcome it one day. I dream now to be a doctor."*

Student 3 *" I love playing mobile games. But I didn't like to read. My parents and teachers always wanted me to read attentively but I didn't realize that I am not able to read fluently even writing clearly on my exam paper. I have confusions with words spellings. I forget every time. I didn't like memorizing words.*

But, when I have given the instructions about how to use these apps, I accept it nicely because I love playing Mobile games. When I use these apps, I enjoyed learning."

Student 4 *"When I have problem with reading, my class peers have mocked with me. I felt ashamed and felt bored. I have also feared to ask questions twice at class as all the other mates were laughing at me. I had not dared to dream because I am a bad student. When I saw bhaia (the researcher) at first, I was encouraged and motivated to talk to him because when I was given the questions to read, he told me that I was correctly uttered all the words which made me feel that I can read and someone is appreciating me though I can now realize that I had made many mistakes in that time."*

Student 5 *"My parent was always pushing me to read more as I could not able to make good result in the examination like my friends. I tried my level best but I could not. My class teachers were also sometimes criticized me because of my result. My main problem was that I could not read as similar as my classmates did. But now, I have less problems to read English words and sentences. It was very easy to use the mobile applications which were set up by the researcher. I am enjoying the learning no."*

6.5-Discussion

The studies on mainstreaming the slow pace learners through mobile assisted language learning: A case of Bengali primary level students with dyslexia has made significant contributions to the promotion of this learning disability for numerous children who struggle with learning. In this study, the needs of kids with learning disabilities were examined in relation to their ability to continue their education in a mainstream setting with the aid of mobile language learning aids.

The mainstreaming of dyslexic children in Bangladesh has many important components, as revealed by the current research. The major findings of the study are discussed in the sections that follow with regard to the experiences that the respondents in the research related to them. This study will discuss the key themes that emerged from the study chapter's and common findings. Multiple forms of discrimination are experienced by children with learning disabilities, which discourages them from continuing their studies. The difficulties they face in accessing education are exacerbated by attitudes toward children with learning disabilities as well as a lack of resources and technology support to accommodate them.

The study demonstrates that dyslexic students still have limited access to mainstream education. Nearly everywhere has schools, but the majority of them are not equipped to support the learning strategies of kids with learning disabilities. Nearly all of the teachers who were interviewed said that students with learning disabilities are extremely sluggish and unwilling to read. Unfortunately, dyslexia and learning disabilities are not even understood by all of the teachers. Parents of dyslexic children, however, do not want to think that their children have academic difficulties. The Bangladeshi government will undoubtedly include kids in its regular education system. But there aren't many suitable teaching aids or educational resources available. Because of this, trained teachers were unable to properly attend to children with learning disabilities during classroom instruction.

Although gradually improving, adequate resource allocation is lacking. Teachers have received training, but they still lack the necessary skills and abilities to manage the needs of each individual student. They are free to engage in a variety of activities. Children with learning disabilities therefore continue to sit alone in the classroom. As a result, they struggle with social adjustment, lose interest in school, and eventually drop out. Some educators feel that this is an additional burden. As a result, parents believe their

children have not improved in this system. Additionally, it results in additional expenses for the family. They stop enrolling their child in school as a result. This finding is consistent with the findings from the study of Mohibul Islam (2019), and Sandhya Limaye (2016). They showed in their research respectively that insufficient opportunities are barrier to continue mainstreaming education of the children with disability.

This study also showed that children with dyslexia have faced more difficulties to utter voiced sounds both in Bangla and English language. Almost all the students have troublesome more than 70% in Bangla voiced sound compared to more than 75% in English voiced sound.

Children having dyslexia have also problems in punctuation identification, time knowledge, clusters, diphthongs to read appropriately which was not find in any literature reviews though the researcher think that more large study need to ensure those criteria.

Sentence repetition is one of the major problems of dyslexic children. All the students have the tendency to repeat both regular and rhyming sentences. This findings was also found from the study of Mall,K, Hulme, C, Nag, S and Snowling, MJ(2015)

Students having dyslexia have a major tendency to face difficulties the words which are multisyllabic. Among the words which they faced trouble almost more than 60% were multisyllabic. This symptom was also shown by Tunmer and Greaney (2010).

Another finding was showed by this study was that children with dyslexia have problems to utter the rhyming sentences. Every child has faced difficulties more than 50% of rhyming sentences from both Bangla and English language. This finding is consistent with the findings from the study of Tunmer and Greaney (2010).

disability can focus more due to the multisensory characteristics.

The study also demonstrated that children having dyslexia have more tendency to hear a word or sound several times for their clarification with more interest. They hear the same word several times and enjoying as they think they are playing games. This findings was represented by J.T. Bruer, 1994; M. Prensky,2003; J.P. Gee ; S. Paper,1988.

By using mobile assisted language learning tools, children with learning disability The study found that mobile assisted language learning tools made the dyslexic children more encouraged and motivated than before as mentioned by Mulligan, 2012 and S. Roxani, S. Eva, G. Anna and Z. Dimitrios,2013. They tried to show that children with learning have got the opportunity to practice more where similar type of data was presented in the practice section. Practicing opportunity helps them to learn clearly (L. Rello, C. Bayarri and A. Gorriz, 2012). That's why, they feel more confident and self-steem (Brozo & Puckett, 2009; Hall & Strangman, 2002; O'Bannon & Puckett, 2010 and M. Thomas: National Council for Educational Technology)

According to the researcher, Children looked more attentive than before during the time of using mobile assisted language learning tools. More attention could be available than before as mentioned by S. Roxani, S. Eva, G. Anna and Z. Dimitrios,2013.

This study also found that children felt more stressed at school when their peer and teachers do consider them as back benchers or poor students. This type of environment made their parents to stop them sending school. But the researcher found that during the time of using mobile assisted language learning tools, all the students were feeling stress free environment as agreed by R. Salah and N.A. Alias, 2012.

CHAPTER SEVEN: CONCLUSION

7.1 Significance of the study

Bangladesh is a developing country, and education can help her to develop significantly. Where an organization like NASA has more than 50% of employees having dyslexia, and since these types of people have great potential in terms of problem solving ability and 3D and spatial consciousness, we can make these children great like Alexander Graham Bell, Galileo Galilei, James Clerk Maxwell, John Robert Horner, and so on. They all were dyslexic.

7.2 Limitations of the study

There are too many issues those could be considered as limitations of this research. Because there aren't many works on dyslexia, testified dyslexic students aren't readily available in Bangladesh. There are misconceptions and a lack of awareness among primary school educators concerning dyslexia (Roper, 2010; Reid, 2005; Wadlington,2005). The lack of consciousness among educators does not help them to understand the needs of children, and this can result in anxiety (Reid,2005). Not only teachers but also parents are not aware of this impairment. As a result, it is very difficult for a researcher to convince the parents and teachers in order to collect data. Sometimes, they may call the researcher as mad. Another limitation is that, clinically testing is very costly. That's why the sample size will not be bigger as expected by the researcher. As a result, it cannot be assumed that the findings are indicative of all schools nationwide or indicative of attitudes given the tiny sample size of this study.

The researcher is optimistic that this study accurately captures both the positive and challenging aspects of mainstreaming slow learners with the sample of dyslexia using mobile assisted language learning, despite the small sample size and varied levels of aptitude of the children.

Since there are no available institutions in Bangladesh to clinically test dyslexia, it is too difficult to find the right place in every district, even in division. The only reason is that dyslexia is not a physical disability. The most significant limitation is; going to the dyslexic child's house (as their parents do not allow the researcher to talk with the children at school) to teach them individually by using Mobile Assisted Language Learning tools. Most of the time, parents would not allow the researcher to go to their house as they think their child has no learning disabilities. In this research, though the children have been taken after testing them cognitively, phonologically, and environmentally; the biological tests have not been done due to the shortage of time, costs, and unwillingness of parents.

7.3 Further Scopes of the Study

It wasn't possible to discuss every topic in one thesis paper. There are several Scopes which could be researched by the future researchers. The further Scopes might be-

a. Is dyslexia a neurological or behavioral impairment? the scientific analysis.
b. The Role of parents and teachers for Mainstreaming the children having dyslexia.
c. Developing a corpus for slow pace learners in terms of their second language acquisition.
d. (Punctuation, name uttering, sentence repetition, time knowledge) are the symptoms of dyslexia.

7.4 Overall Findings

1. Children look more encouraged than before.
2. They can focus more due to the multi-sensory characteristics.
3. They hear the same word several times and enjoying as they think they are playing games.
4. Practicing opportunity helps them to learn clearly.
5. More attention has given than before.
6. They seem more motivative than previous.

7.Increasing their confidence and self- esteem.
8. Interest enhances focusing on a content area Instructions.
9. Feels more stress free environment.
10. Improving mind mapping abilities.

7.5 Conclusion and Recommendations

There are numerous extremely talented children who struggle to read, and because of this, they are viewed as less intelligent than their classmates. (Stanger & Donohue,1937). Despite having several limitations, it can be mentioned that a large proportion of children in Bangladesh have been suffering from dyslexia; a learning impairment. However, from this research, it could be said that, the findings suggest that it is possible to mainstream the children having dyslexia by using Mobile Assisted Language Learning. It is also possible to assist students with dyslexia in mainstreaming by focusing on phonological, morphological, and syntactical awareness. Individuals are empowered by technology to make the world accessible to their specific need (Hayden, 2011)

Moreover, it was surely possible introducing dyslexic students with a multisensory learning system. The researcher suggests to propose a focused device like mobile phone (positive use) to assist dyslexic students in dealing with phoneme-grapheme harmonization, which are critical in reading. Parents and teachers must need to know more about this impairment. They have no idea about this learning impairment yet. It is as important as others physical impairments.

Then, Technology use must be included into the curriculum in order to support grade-level academic standards in a way that is consistent with each student's individualized education plan (Brozo & Puckett, 2009).

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Appendix

Appendix 1: Stimuli for students before using Mobile Assisted Learning Tools with Checklist

Student Name:

Age:

Gender:

Bangla alphabets

Serial No.	Alphabets	No Difficulties	Difficulties	Serial No.	Alphabets	No Difficulties	Difficulties
1	ক			26	ল		
2	চ			27	হ		
3	ট			28	ঃ		
4	ত			29	ঈ		
5	প			30	ঐ		

6	য			31	ঘ		
7	স			32	ঝ		
8	ঢ়			33	ঢ		
9	আ			34	ধ		
10	ঋ			35	ভ		
11	খ			36	ব		
12	ছ			37	য়		
13	ঠ			38	ঁ		
14	থ			39	ঊ		
15	ফ			40	ও		
16	র			41	ঙ		
17	ষ			42	ঞ		
18	ং			43	ণ		
19	ই			44	ন		
20	এ			45	ম		
21	গ			46	শ		
22	জ			47	ড়		
23	ড			48	অ		
24	দ			49	ঊ		
25	ব			50	ঔ		

English alphabets

Serial No.	Alphabets	No Difficulties	Difficulties	Serial No.	Alphabets	No Difficulties	Difficulties
1	a A			14	u U		
2	g G			15	d D		
3	m M			16	j J		
4	s S			17	p P		
5	y Y			18	v V		
6	b B			19	e E		
7	h H			20	k K		
8	n N			21	q Q		
9	t T			22	w W		
10	z Z			23	f F		
11	c C			24	l L		
12	i I			25	r R		
13	o O			26	x X		

Mathematics

Digits & Symbols	No Difficulties	Difficulties	Digits & Symbols	No Difficulties	Difficulties
১			48		
৭			=		
1			৪		
7			১০		
×			4		
৪৮			10		
২			84		
৮			<		
2			৫		
8			০		
÷			5		
৭৯			+		
৩			96		
৯			৬		
3			0		
9			6		
৬৯			-		

Bangla regular words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	আমি			11	কালো		
2	বাঘ			12	নাচা		
3	ভালো			13	তারা		
4	খেলা			14	বাংলাদেশ		
5	তুমি			15	পঁচা		
6	নদী			16	গাওয়া		
7	সুন্দর			17	আমাদের		
8	যাওয়া			18	বাবা		
9	সে			19	ভাঙ্গা		
10	গ্রাম			20	ঘুমা		

Bangla irregular words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	কক্ষ			11	গম্বুজ		

2	বঙ্গবন্ধু			12	গণিত		
3	প্রাকৃতিক			13	রবীন্দ্রনাথ		
4	বিদ্যালয়			14	হাঙ্গর		
5	বন্যা			15	চন্দ্র		
6	বিজ্ঞান			16	বিশ্ব		
7	সুন্দরবন			17	পরীক্ষা		
8	ধর্ম			18	প্রাথমিক		
9	মন্দির			19	ক্লাস		
10	আষাঢ়			20	পৃথিবী		

Bangla pseudo words

Serial No.	Words	No Difficulties	Difficulties
1	কাআশ		
2	কিস্কুট		
3	মসাজ		
4	মুগরী		
5	মসদিজ		
6	ঠাঁকাল		
7	গ্রীস্সকাল		
8	প্রমথ		
9	মসয়কাল		
10	দিব্যালয়		

English regular words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	Was			26	Other		
2	This			27	Who		
3	Sleep			28	Then		
4	Her			29	Him		
5	Such			30	On		
6	Shall			31	Has		
7	Woman			32	Here		
8	Were			33	Sew		
9	Uncle			34	Most		
10	Saw			35	What		
11	Their			36	Than		
12	Our			37	Bin		
13	Sheep			38	No		

14	Some			39	Have		
15	Will			40	Three		
16	Would			41	Show		
17	Offer			42	More		
18	Aunty			43	That		
19	How			44	Slip		
20	There			45	Bean		
21	He			46	Ship		
22	So			47	Had		
23	Same			48	Man		
24	Well			49	Are		
25	Could			50	Yes		

Bangla regular sentencs

Serial No.	Sentences	No Difficulties	Difficulties
1	লাউয়ের মাচায় ঝুলছে লাউ।		
2	মৌমাছিরা ফুল থেকে মধু আহরণ করে।		
3	কে তাকে কী রকম ভালোবাসে?		
4	পুলিশ মিছিল করতে নিষেধ করেছে।		
5	তাতে কতো রকমের জিনিস।		
6	ঝোপে লাল হলুদ কাগজের ফুল লাগাল।		
7	বুড়ির ছিল তিনটি কুকুর।		
8	আয় আয় তু তু, রঙ্গা বঙ্গা ভুতু।		
9	মোস্তফা কামাল তখন চব্বিশ বছরের যুবক।		
10	পাখি আমাদের অনেক উপকার করে।		
11	টিয়া সবুজ রঙের পাখি।		
12	গ্রামখানি ছবির মতো সুন্দর।		
13	আমরা আনন্দে নেচে উঠলাম।		
14	দেখলাম বুড়িগঙ্গা নদীর উপর ব্রিজ।		
15	স্টিমার ক্রমশ সদরঘাট পেরিয়ে এগিয়ে চলছে।		
16	এমন সময় একটি বিজ্ঞপ্তি এলো।		
17	ছবি আর ইজাজ মায়ের সঙ্গে ঢাকা এলো।		
18	একজন ট্রাফিক পুলিশ লোকটিকে রাস্তার কিনারে নিয়ে এলেন।		
19	সবুজ পাতার মধ্যে দুলছে সাদা ফুল।		
20	গাছ আমাদের উপকার করে।		
21	তিন কন্যাকে নিয়ে রাজা- রানির বেশ সুখেই দিন কাটছিল।		
22	গুলিয়ে নিহত হলেন রফিক, সালাম, বরকত, জব্বারসহ নাম না জানা অনেকে।		

23	এই ভাষাশহিদেরা মাতৃভাষাকে ভালোবাসতেন।		
24	রূপা আপামনির হাতে একটি ডালা।		
25	আপনি দয়া করে একটু উঠে দঁাড়ান।		

Bangla rhyming sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	সূর্য ওঠার পূর্বদেশ, বাংলাদেশ!		
2	আমার দেশ স্বাধীন দেশ, বাংলাদেশ!		
3	হাটে যাবো হাটে যাবো ঘাটে নেই নাও,		
4	নি-ঘাটা নায়ের মাঝি আমায় নিয়ে যাও।		
5	ঊর্ধ্ব গগনে বাজে মাদল,		
6	নিম্নে উতলা ধরনী-তল,		
7	অরুণ প্রাতের তরুণ দল		
8	চল্ রে চল্ রপ চল।		
9	তাল গাছ এক পায়ে দঁাড়িয়ে, সব গাছ ছাড়িয়ে		
10	সকালে উঠিয়া আমি মনে মনে বলি,		
11	সারাদিন যেন আমি ভালো হয়ে চলি।		
12	আমাদের ছোট গঁায়ে ছোট ছোট ঘর		
13	থাকি সেথা সবে মিলে নাহি কেহ পর।		
14	কৃষকের শিশু কিংবা রাজার কুমার		
15	সবারি রয়েছে কাজ এ বিশ্ব মাজার।		
16	ঘুড়িরা উড়িছে বন মাথায়।		
17	হলুদে সবুজে মন মাতায়।		
18	আপনাকে বড় বলে, বড় সেই নয়,		
19	লোকে যারে বড় বলে,বড় সেই হয়।		
20	মনের ভাষা জনের ভাষা		
21	এই ভাষাতে ভালোবাসা।		
22	সোনামুখে সোনা হাসি তার কিছু দিও।		
23	হাসিটুকু নিও আর খুশিটুকু নিও।		
24	ঊষার দুয়ারে হানি আঘাত		
25	আমরা আনিব রাঙ্গা প্রভাত।		

English regular sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	How are you?		

2	I'm fine, thank you.		
3	I read in class three at Nilkhet Government Primary School.		
4	How old are you?		
5	She cones from Rajshahi.		
6	Would you like to come to my house?		
7	Sing the national anthem.		
8	May Allah help her.		
9	What month is it now?		
10	A farmer grows food.		
11	A cobler mends shoes.		
12	We speak in English.		
13	The cow is eating grass.		
14	Riya and Mashuk are at school.		
15	Maliha is Bangladeshi.		
16	The Buriganga river is very big.		
17	The frogs swim away.		
18	There are four people in my family.		
19	We are in the same class.		
20	Where does Rafif sit in the class?		
21	What do you do in the afternoon?		
22	We should eat healthy food.		
23	I also like vegetables.		
24	The nest is above a corn field.		
25	She leaves the young crows.		

English rhyming sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	There are 30 days in September,		
2	April, June and November.		
3	All the rest have 31,		
4	Not February, It's a different one.		
5	It has 28, that's fine.		
6	A Leap Year makes it 29.		
7	Saturday, Sunday		
8	Monday, Tuesday		
9	Wednesday, Thursday		
10	Friday.		
11	Raise your hand if you know the day.		
12	Solomon Grundy,		
13	Born on a Monday,		

14	Christrned on Tuesday,		
15	Married on Wednesday,		
16	Took ill on Thursday,		
17	Grew worse on Friday,		
18	Died on Saturday,		
19	Buried on Sunday:		
20	And that was the end		
21	Of Solomon Grundy.		
22	Brush Brush Brush Your Teeth,		
23	Brush it every day!		
24	Clean Clean Clean Your Body,		
25	Clean it every day!		

Appendix 2: Dyslexia Screening Test

Harp Learning Institute(2014).

It is tool that give us indications of dyslexia. If your student scores within the ranges that indicate dyslexia, it is advised that you seek professional help for the student.

Independent Activities:

Researcher read the instructions to the student.

1. **Print the alphabet below in lower case letters:**

2. **Circle all of the b's:**

b d b q d b p d b b q q b
p d q b d d b b d p q b d
q b d b p p d b p b d p b

3. **Circle each reversed letter:**

p	h	x	o	t	ɔ
		t	k		

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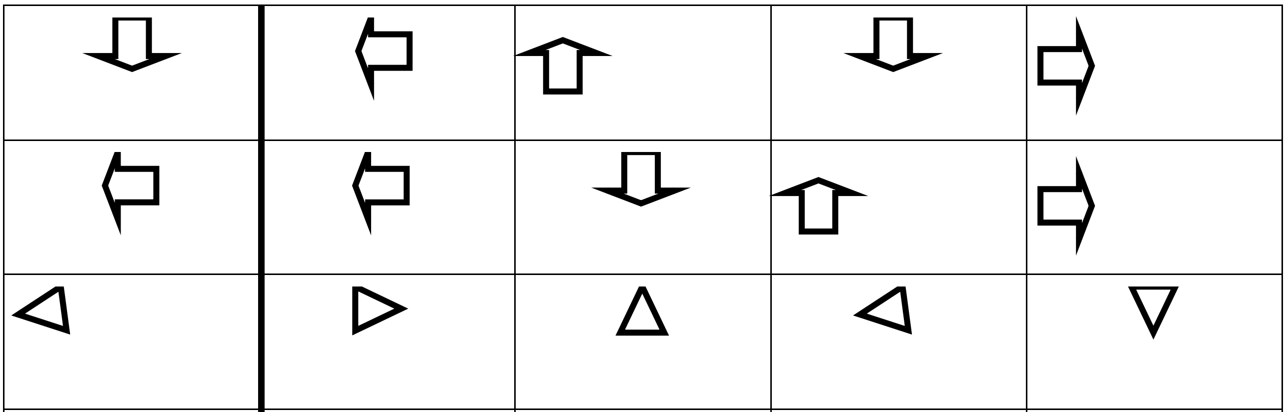
w	m			ƨ	q
r	n	g	w	ɘ	g
d	ɿ	h	S	ꙅ	ɟ

4. **Look at the first figure in the column. Circle the matching figure to the right of the line.**



b	d	b	q	p
d	q	p	d	b

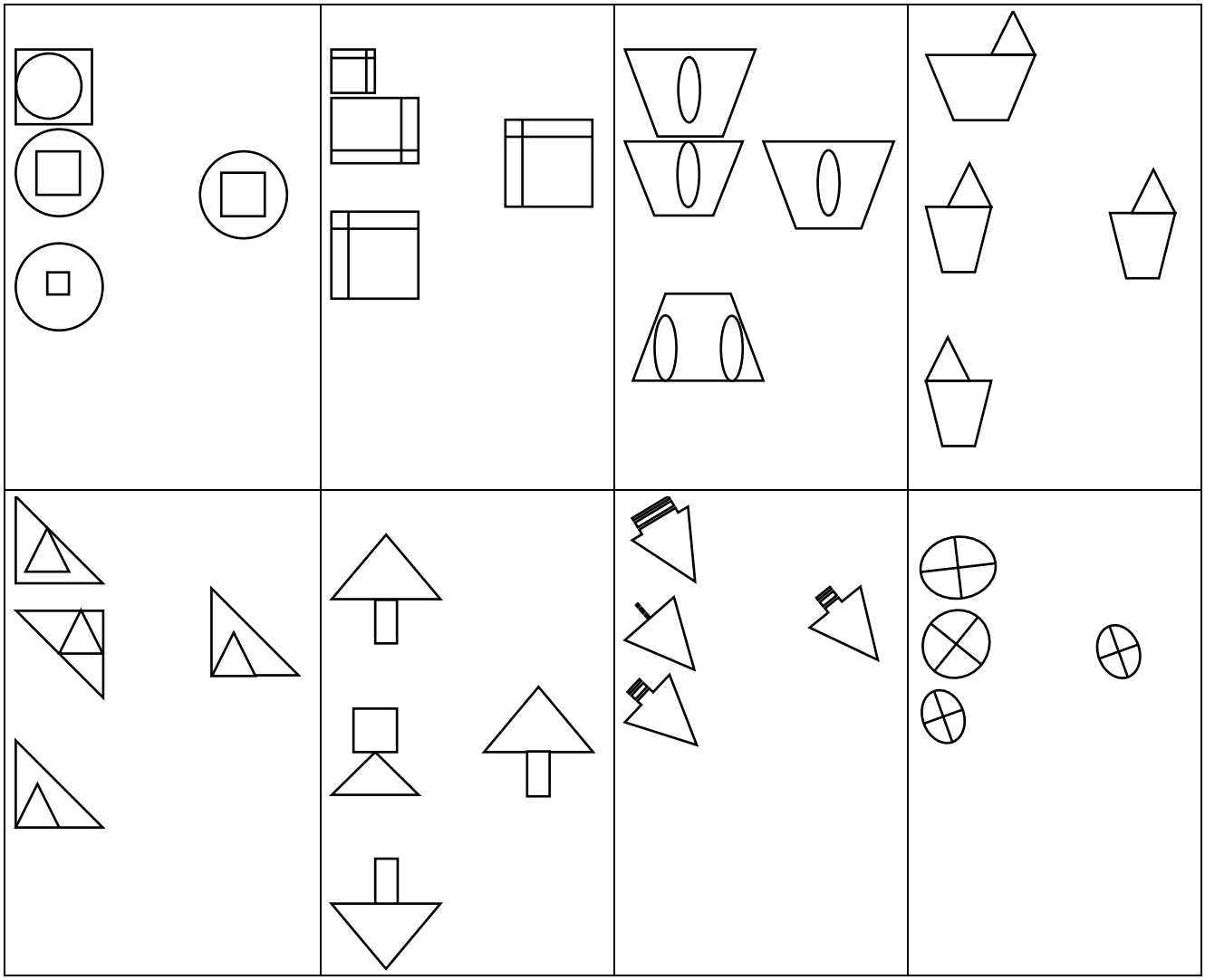
5. **Look at the word on the left and circle the word on the right that matches.**

	the		them
the	ɘʜɈ	then	nɘʜɈ
	ten		then

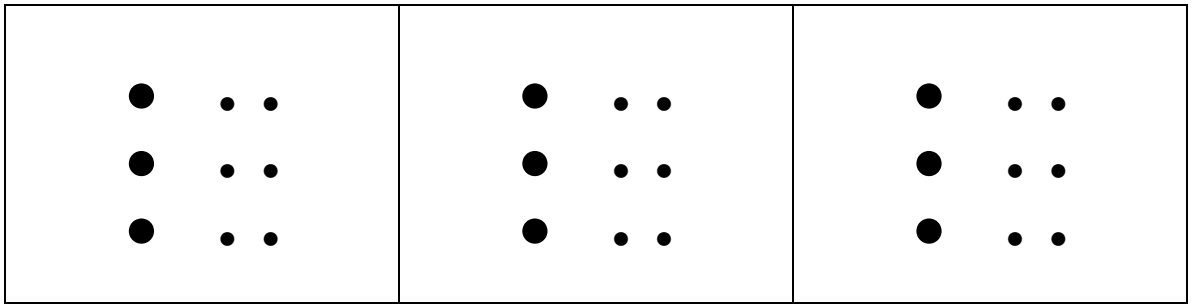
6. Circle each was.

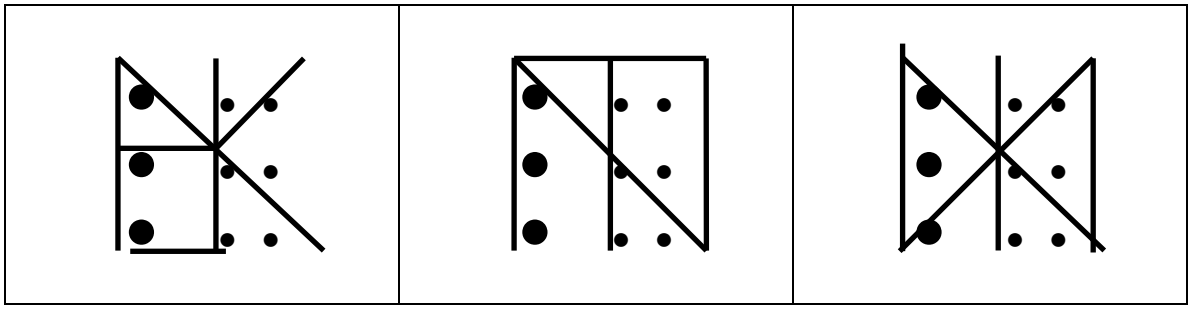
was raw	saw way was	saw
saw was	way saw win	war
was why	saw was saw	was

7. Look at the figure on the right and circle the one on the left that matches.



8. Have the student copy the figures from the bottom to the dots on top.

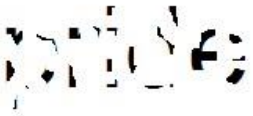




9. Look at each word and figure out what it is. Write the word on the line.

_____

_____



_____

10. Look at the letters at the left. Cover them up and copy them from memory on the line.

b p d p _____

q q b g d _____

d g b d p q _____

11. Circle each reversed letter within the word

her	lit	dog	lag	not
now	him	mab	dow	mall
owl	nut	qen	rsn	sat

12. Circe each reversed word.

own	got	bat	too	qiz
nst	can	tip	pan	bsd

Teacher or Parent Directed Activities:

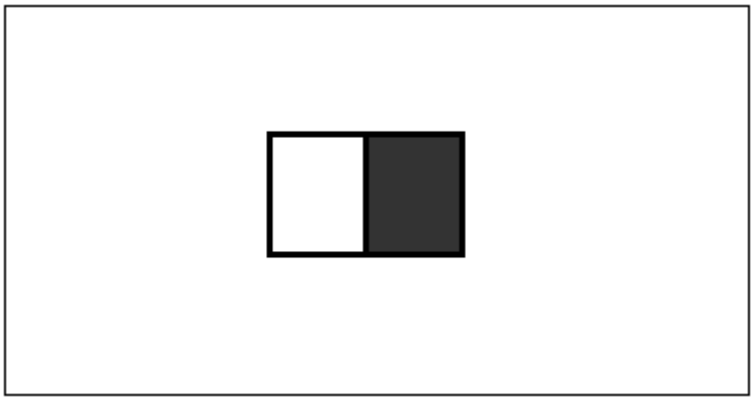
Follow the given instructions for the student to perform.

13. Read each word out loud and have the student circle the words that rhyme with the word gut. (4words will rhyme).

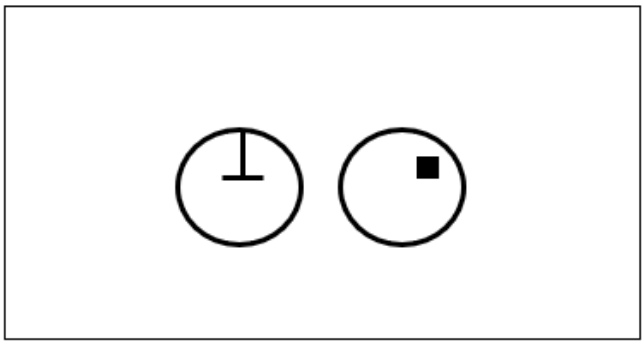
cut		bun	but	bud
	sun	rut	tub	nut

14. Hold card #1 up to the student for 5 seconds. Take it away and have the student reproduce it on one of the blank cards. Do the same with card #2, holding up for 10 seconds. Do the same for card #3 for 15 seconds.

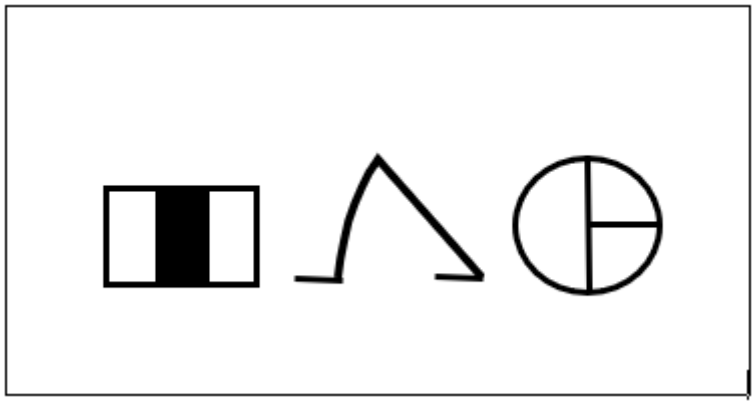
#1



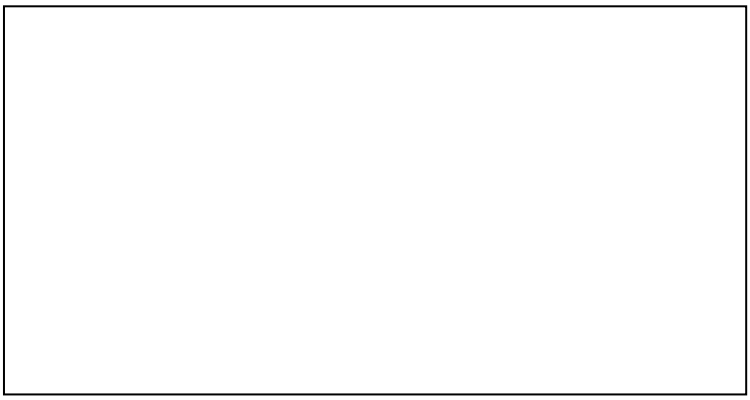
#2

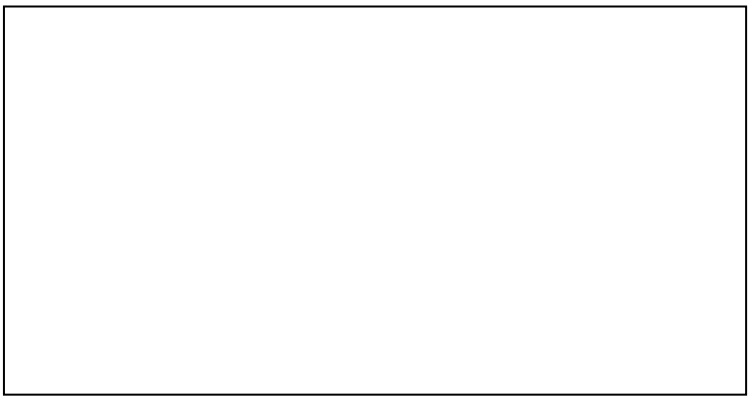


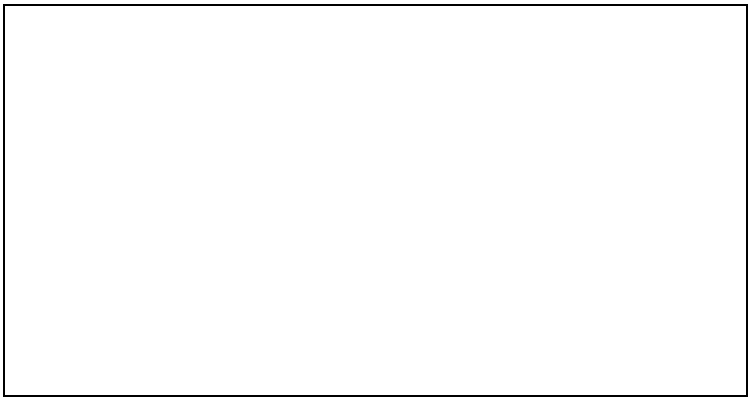
#3



Blank Cards





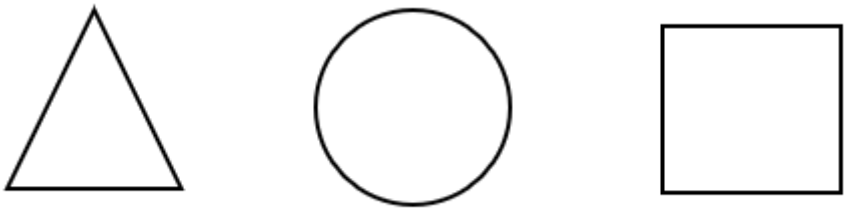


15. Read the following words out loud. Mark the words the student misses.

dad	bad	bib	did	bid	dip	bed
dab	dob	dib	bop	pod	dap	pad

16. Have the student:

Draw a vertical or up and down line on top of the triangle.
Draw a horizontal or sideways line under the circle.
Draw a diagonal or slanted line through the square.



17. Say each group of words out loud and have the student repeat them back to you in the exact same order: (Say the words slowly and clearly.)

1. dog - snake- moon
2. please- simple- bringing- supple
3. design – frighten- glistening- production –desperate

18. Read the following sound segments out loud. Have the student repeat them to you. Mark those sounds the student misses.

og	in	eep	one	ib	ort
fuh	yuh	esp	unk	ab	esk
ert	wuh	ane	oon	ut	osk

19. Have the student repeat these words exactly back to you. Mark yes or no.

vacationing in Venice _____

curiously courteous _____

animals in aluminum _____

suspicious suddenly _____

arguable announcing _____

conscientious candidate _____

Answer Key:

1. Print the alphabet below in lower case letters:

a b c d e f g h i j k l m n o p

_____

q r s t u v w x y z

_____

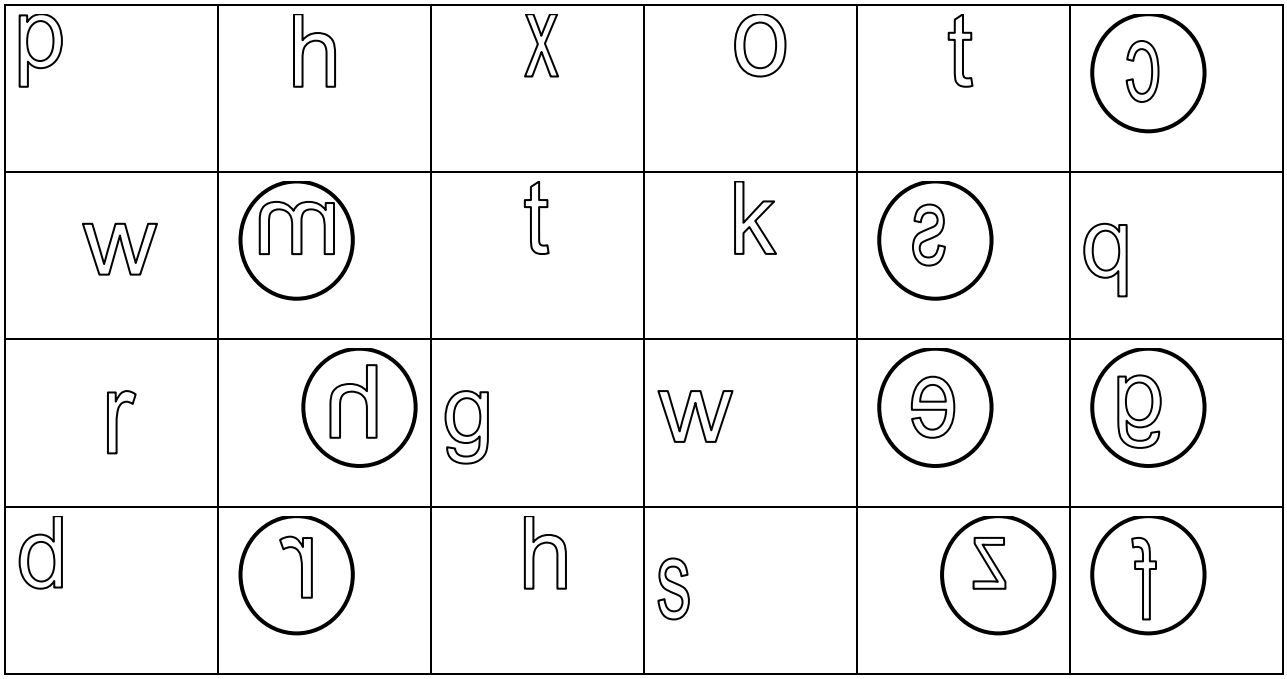
-the alphabet should be in lower case letters and in the correct order. -it should take no longer than three minutes for the student to complete the alphabet
-there should be no reversed or improperly formed letter
-count each letter as a point Total wrong:_____

2. Circle all of the b's:

b	d	b	q	d	b	p	d	b	b	q	q	b
p	d	q	b	d	d	b	b	d	p	q	b	d
q	b	d	b	p	p	d	b	p	b	d	p	b

-count each letter as a point
Total wrong:_____

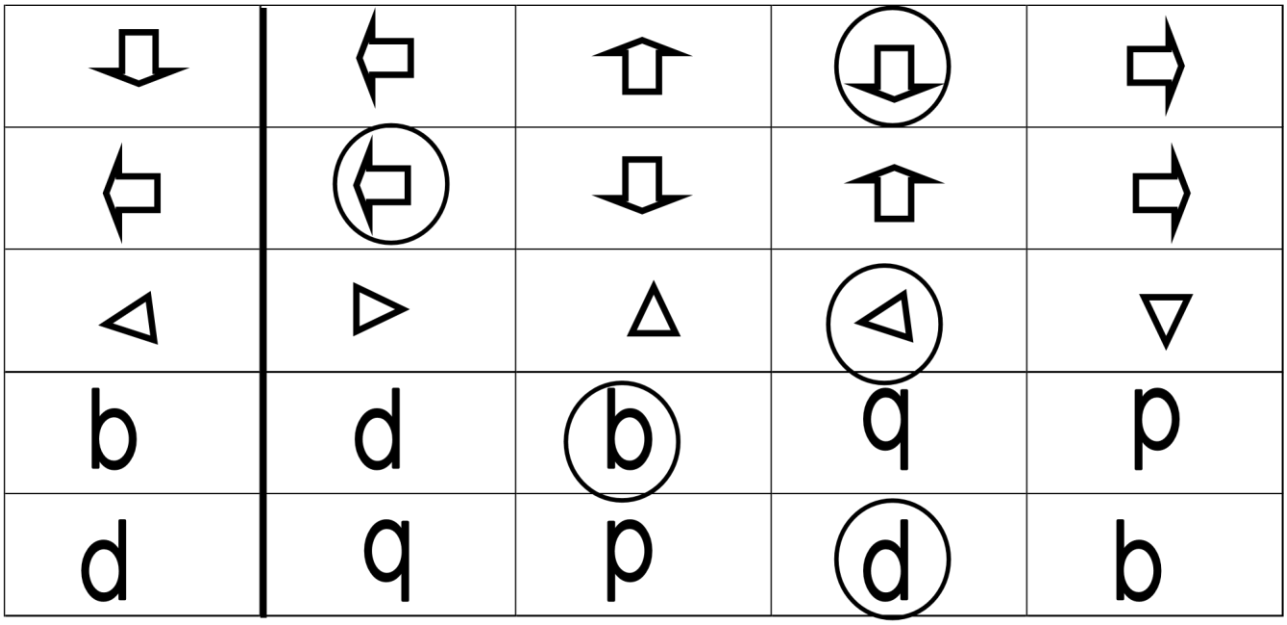
3. Circle each reversed letter:



-if the student circles a correct letter, mark it wrong

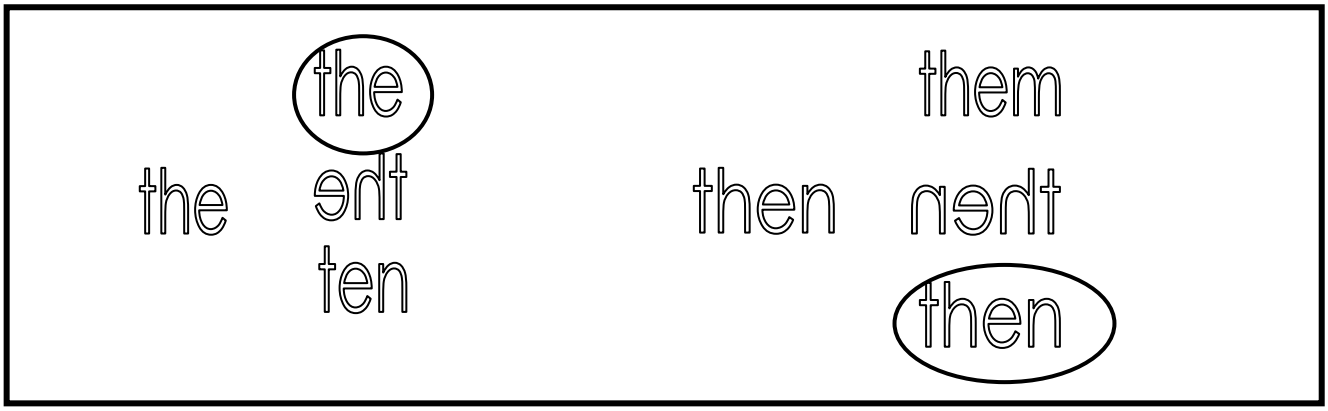
Total wrong:_____

4. Look at the first figure in the column. Circle the matching figure to the right of the line.



Total wrong:_____

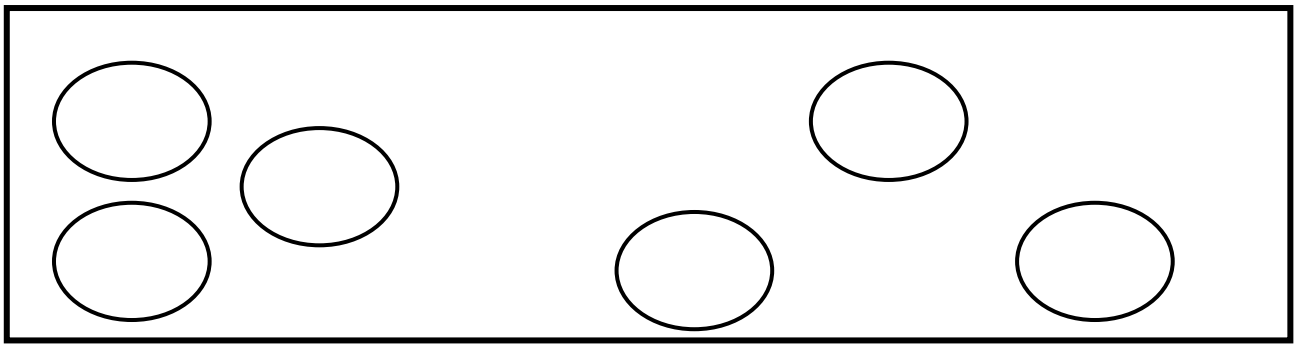
5. Look at the word on the left and circle the word on the right that matches.



Total wrong:_____

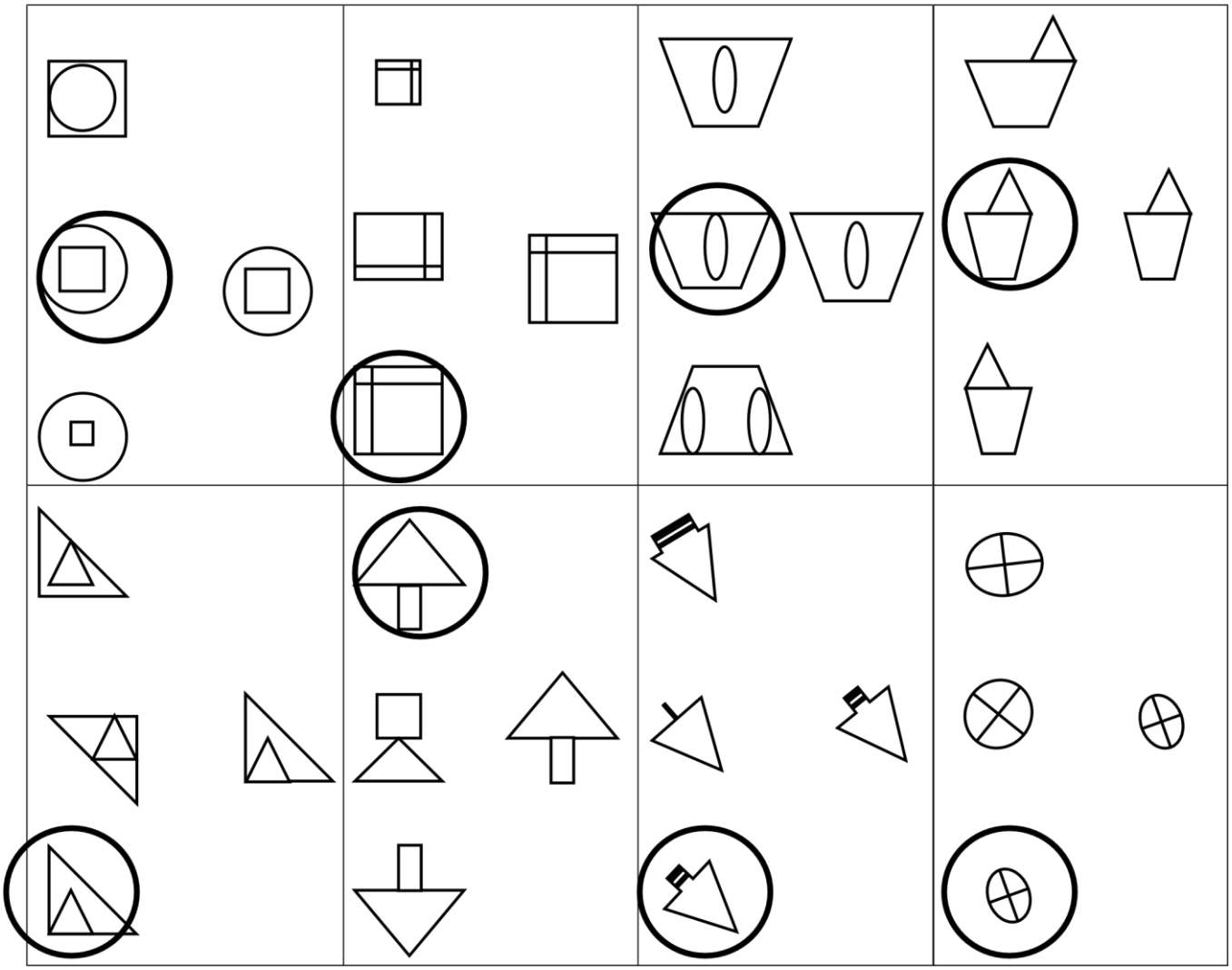
6. Circle each was.

was raw saw way was saw saw was way saw win war
was why saw was saw was



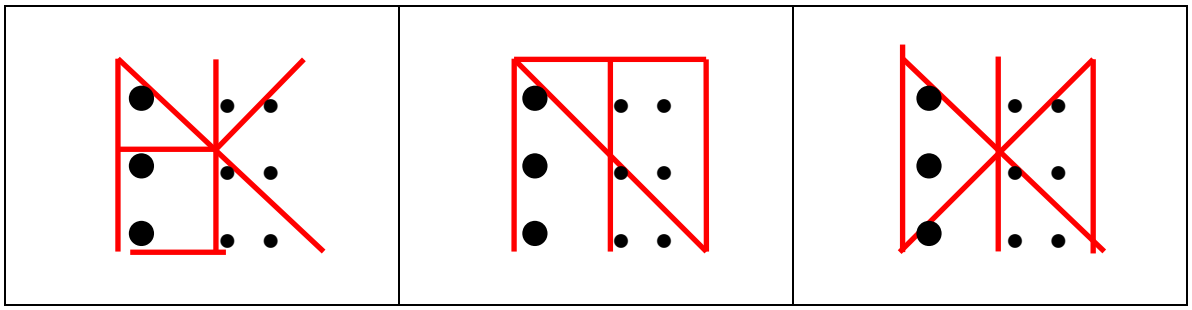
Total wrong:_____

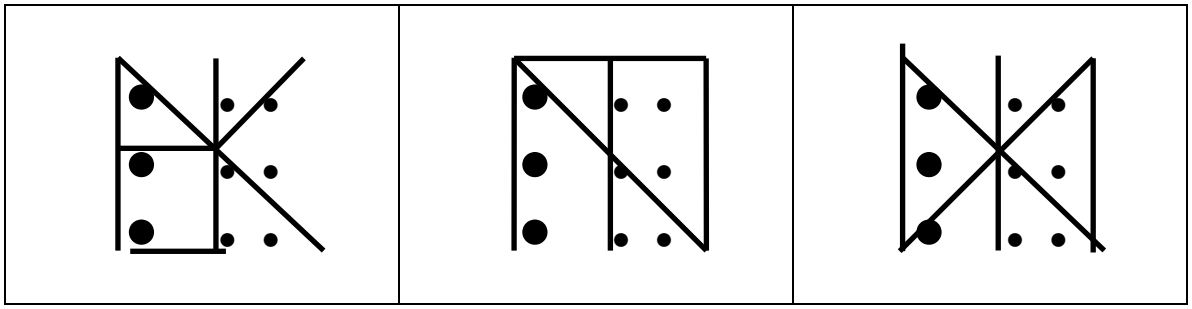
7. Look at the figure on the right and circle the one on the left that matches.



Total wrong:_____

8. Have the student copy the figures from the bottom to the dots on top.



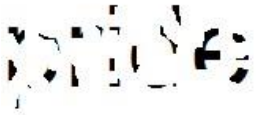


-count each square as one total answer
Total wrong:_____

9. Look at each word and figure out what it is. Write the word on the line.

quake

tribe



pride

Total wrong:_____

10. Look at the letters at the left. Cover them up and copy them from memory on the line.

b p d p **b p d p**

_____

q q b g d **q q b g d**

_____

d g b d p q d g b d p q

_____

-count each line as one total answer
Total wrong:_____

11. Circle each reversed letter within the word

her	lif	dog	lag	not
now	him	mab	dow	mall
owl	nut	qen	rsn	saf

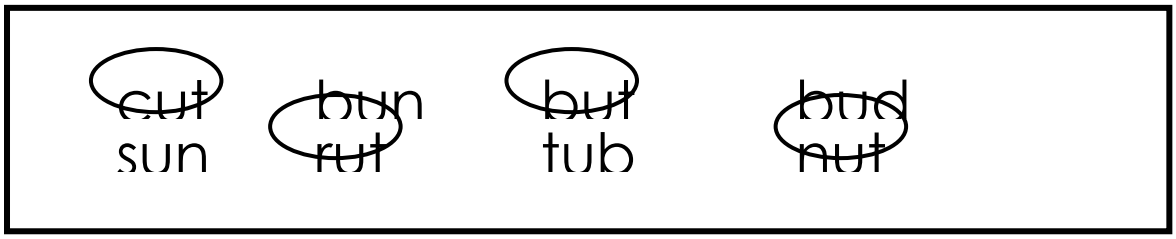
-mark it wrong if the student circles a correct letter
Total wrong:_____

12. Circe each reversed word.

own	90f	bat	too	qiz
nst	can	tip	pan	bsd

-mark it wrong if the student circles a correct word
Total wrong:_____

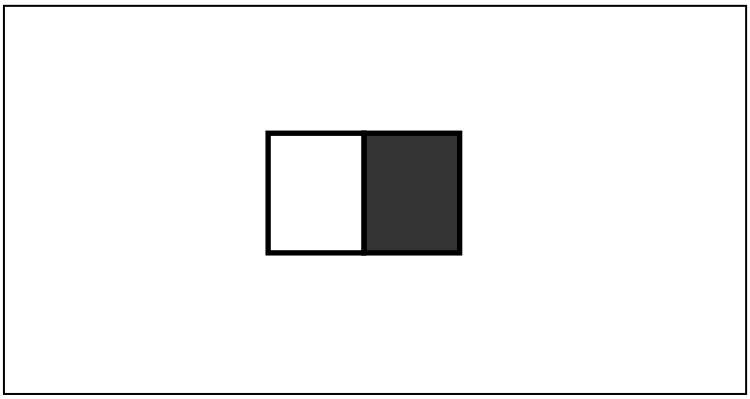
13. Read each word out loud and have the student circle the words that rhyme with the word gut. (4words will rhyme).



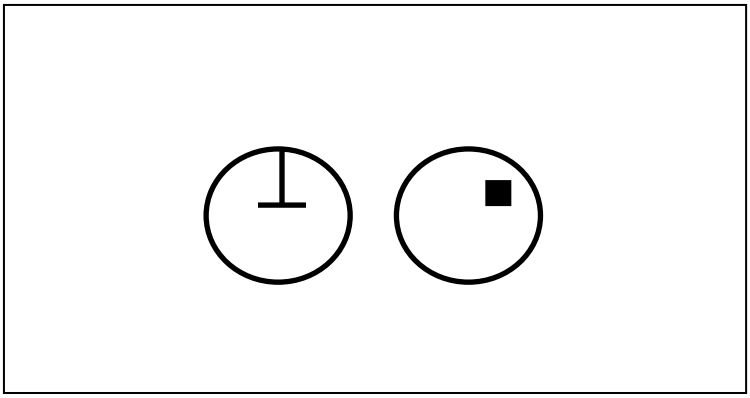
-mark it wrong if the student circles a non-rhyming word
Total wrong:_____

14. Hold card #1 up to the student for 5 seconds. Take it away and have the student reproduce it on one of the blank cards. Do the same with card #2, holding up for 10 seconds. Do the same for card #3 for 15 seconds.

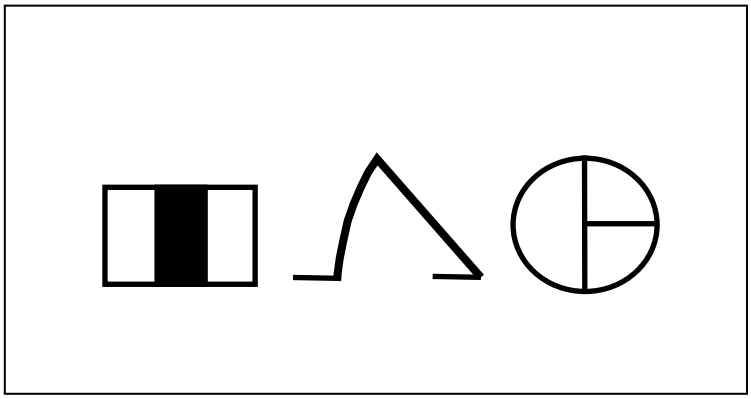
#1



#2

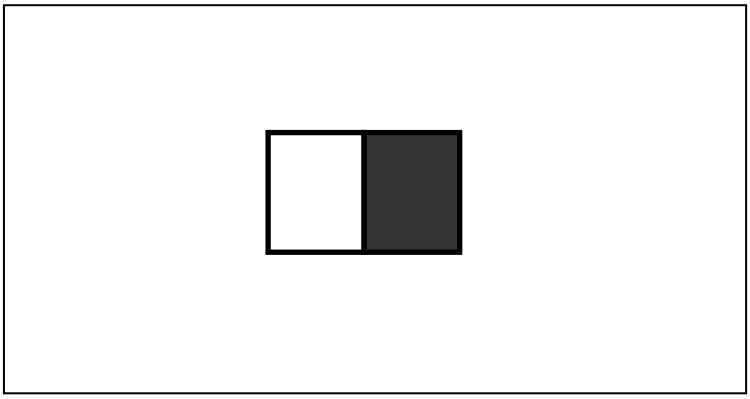


#3

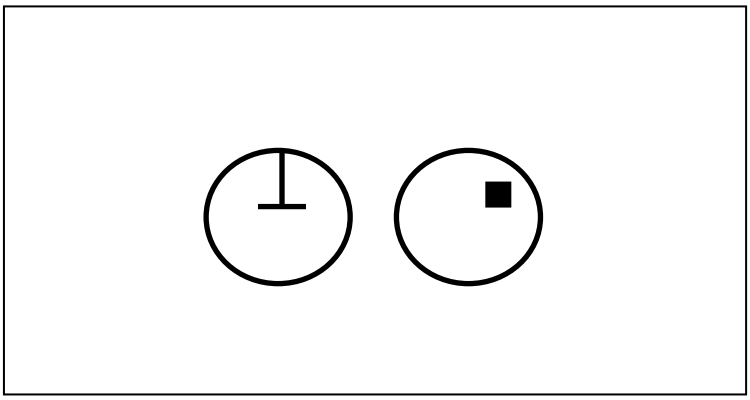


Blank Cards

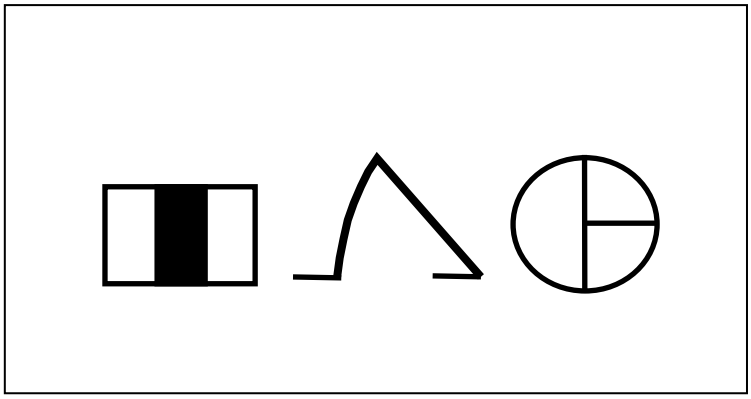
#1



#2



#3



Total wrong:_____

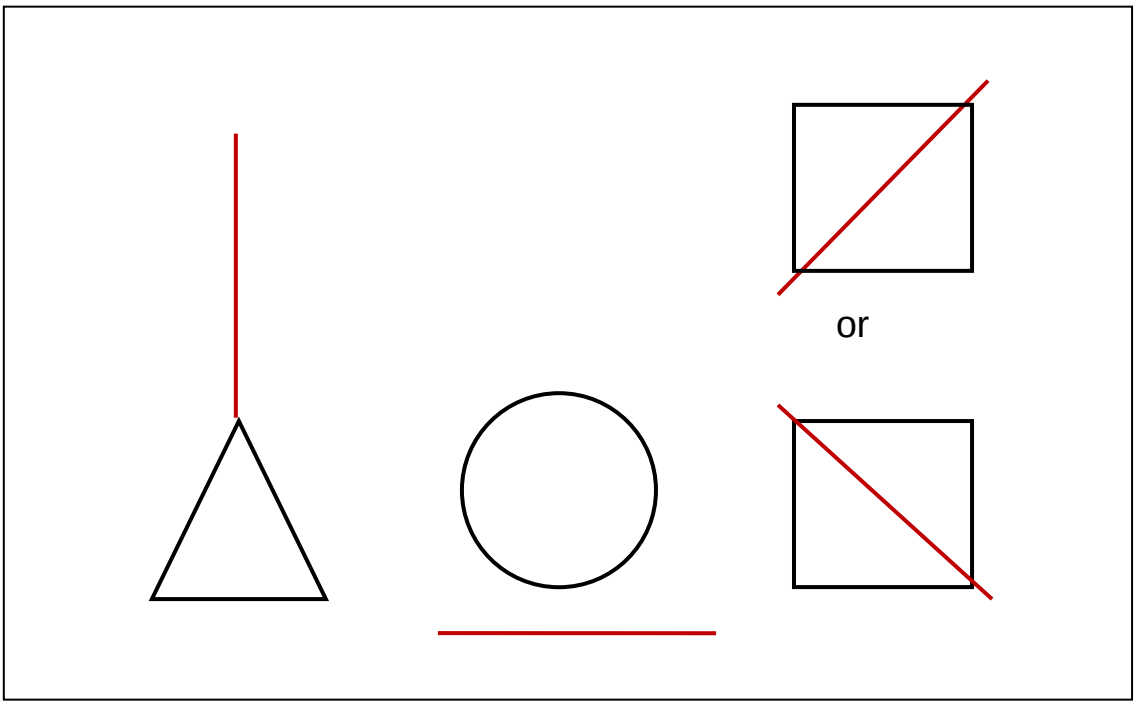
15. Have the student read the following words out loud. Mark any mistakes:

dad bad bib did bid dip bed

dab dob dib bop pod dap pad

Total wrong:_____

16. Have the student:
Draw a vertical or up and down line on top of the triangle.
Draw a horizontal or sideways line under the circle.
Draw a diagonal or slanted line through the square.



Total wrong:_____

17. Say each group of words out loud and have the student repeat them back to you in the exact same order:
(Say the words slowly and clearly.)
dog - snake- moon
please- simple- bringing- supple
design – frighten- glistening- production –desperate
Total wrong:_____

18. Read the following sound segments out loud. Have the student repeat them to you. Mark those sounds the student misses.

og	in	eep	one	ib		ort
fuh	yuh	esp	unk	ab		esk
ert	wuh	ane	oon	ut		osk
Total wrong:_____						

19. Have the student repeat these words exactly back to you. Mark yes or no.

vacationing in Venice			_____
curiously courteous			_____
animals in aluminum			_____
suspicious suddenly			_____
arguable announcing			_____
conscientious candidate			_____

Total wrong:_____

Dyslexia Screening Test Results

1. Total up how many the student has missed:

_____

Appendix 3: Stimuli for students after Using Mobile Assisted Language Learning Tools with Checklist

Student Name:

Age:

Gender:

Bangla alphabets:

Serial No.	Alphabets	No Difficulties	Difficulties	Serial No.	Alphabets	No Difficulties	Difficulties
1	ব			26	ঞ		
2	ক			27	খ		
3	ট			28	ঘ		
4	ঠ			29	হ্ম		
5	ড			30	হ্ম		
6	ঢ			31	এ		
7	ড়			32	ও		
8	ঢ়			33	ক্ষ		
9	র			34	ক্ত		
10	ত			35	ট্ট		
11	থ			36	ঐ		
12	দ			37	স্থ		
13	ধ			38	ক্ল		

14	চ			39	গ		
15	ছ			40	ঊ		
16	জ			41	মূ		
17	ঝ			42	জী		
18	ন			43	পৌ		
19	ণ			44	ম্ভ		
20	ম			45	চ্ছ		
21	য			46	ন্ত		
22	শ			47	ৎ		
23	স			48	ঋ		
24	ষ			49	ঁ		
25	ঙ			50	ংং		

English alphabets

Serial No.	Alphabets	No Difficulties	Difficulties	Serial No.	Alphabets	No Difficulties	Difficulties
1	b			14	E		
2	d			15	Q		
3	n			16	F		
4	m			17	G		
5	h			18	S		
6	o			19	R		
7	p			20	L		
8	q			21	C		
9	u			22	X		
10	v			23	Y		
11	w			24	D		
12	r			25	V		
13	j			26	B		

Mathematics

Digits & Symbols	No Difficulties	Difficulties	Digits & Symbols	No Difficulties	Difficulties
6			৬০৯		
9			709		
7			484		
0			335		
৬			996		
৭			779		
৮			÷		

০			২৪৮		
৪			৫১০		
4			9৯0০		
8			৬6৭7		
79			৩33৫		
109			১১1		
+			৪48৮		
-			২3৪5		
×			৭৪৯0		
=			2৬4৭		

Bangla irregular words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	সামরিক			11	ভূমিকম্প		
2	বাণিজ্যিক			12	স্বাধীনতা		
3	প্রযুক্তি			13	বিজ্ঞান		
4	দারিদ্র্য			14	প্রাথমিক		
5	বহুমুখী			15	মাতৃভাষা		
6	অর্থনৈতিক			16	রাষ্ট্রপতি		
7	অঞ্চল			17	প্রধানমন্ত্রী		
8	জনসংখ্যা			18	বিদ্যুৎ		
9	চিকিৎসা			19	সাহিত্য		
10	বাসস্থান			20	শিক্ষার্থী		

Bangla regular words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	গাছপালা			11	মানুষ		
2	আদেশ			12	লড়াই		
3	আপন			13	শক্তি		
4	মৃত্যু			14	নিরাপদ		
5	উপর			15	আধুনিক		
6	আলো			16	প্রতিবেশী		
7	কঠিন			17	পাঠশালা		
8	গুরুজন			18	ব্যায়াম		
9	চঞ্চল			19	মুক্তিযুদ্ধ		

10	বিশ্রাম			20	মিছিল		

Bangla pseudo words

Serial No.	Words	No Difficulties	Difficulties
1	কতিবা		
2	পসয়া		
3	গোকালার		
4	পবিরার		
5	দোনলা		
6	কাআশ		
7	রছব		
8	নিধেষ		
9	বিদপ		
10	পালতা		

English words

Serial No.	Words	No Difficulties	Difficulties	Serial No.	Words	No Difficulties	Difficulties
1	Board			26	Their		
2	Textbook			27	There		
3	Fareha			28	Three		
4	Pairwork			29	Regular		
5	Student			30	Irregular		
6	Teacher			31	Son		
7	Person			32	Sun		
8	Think			33	Sight		
9	Know			34	Side		
10	Such			35	Wear		
11	Once			36	Where		
12	Was			37	Since		
13	Saw			38	Scent		
14	Dig			39	Beautiful		
15	Dog			40	Excellent		
16	How			41	Grandpa		
17	Who			42	Grandma		
18	Whom			43	Some		
19	Where			44	Same		
20	After			45	Talk		
21	Before			46	Walk		
22	Tip			47	Thought		

23	Pit			48	Bought		
24	Felt			49	Give		
25	Left			50	Live		

Bangla regular sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	তোমাদের শ্রেণিকক্ষ পরিস্কার রাখা উচিত।		
2	রুনু ও আনিস, এদিকে এসো।		
3	আমাকে একটু তুলে ধরো না ভাই।		
4	কোথায় লাগাব পতাকাটা?		
5	খুব সুন্দর কাজ হয়েছে তোমাদের।		
6	সকলে মিলে আত্মরক্ষা করলেন পরিখার মধ্যে।		
7	এ দায়িত্ব কে নেবে?		
8	কোকিল বসন্তকালে ডাকে।		
9	কালো পালকে তার শরীর ঢাকা।		
10	খুব চালাক বলে নাম আছে কাকের।		
11	বুলবুলি পাখির আছে মিষ্টি কণ্ঠ।		
12	গ্রামখানি ছবির মতো সুন্দর।		
13	গ্রামে তপু আর কান্তার অনেক বন্ধু।		
14	সবাই একসাথে আনন্দে সময় কাটায়।		
15	রাতুলের চারদিকে ঘুরতে লাগলো সবাই।		
16	ময়না পাখি মানুষের কথা অবিকল নকল করতে পারে।		
17	পাকিস্তানি সৈন্যরা সংখ্যায় অনেক।		
18	বঙ্গবন্ধু স্বাধীনতার ডাক দেন।		
19	বাংলাদেশের প্রকৃতি অনেক সুন্দর।		
20	সুন্দরবন এদেশের দক্ষিণে অবস্থিত।		
21	রয়েল বেঙ্গল টাইগার বাংলাদেশের জাতীয় পশু।		
22	আমাদের বিদ্যালয় অনেক সুন্দর।		
23	আমি প্রতিদিন স্কুলে যাই।		
24	বন্ধুদের সাথে খেলতে অনেক ভালো লাগে।		
25	ভালো করে পড়াশোনা করতে হবে।		

Bangla rhyming sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	আমাদের ছোট গাঁয়ে ছোট ছোট ঘর		
2	থাকি সেথা সবে মিলে নাকি কেহ পর।		
3	আমগাছ জামগাছ বঁাশ ঝাড় যেন,		
4	মিলে মিশে আছে ওরা আত্মীয় হেন।		
5	সকালে সোনার রবি পূব দিকে ওঠে		
6	পাখি ডাকে, বায়ু বয়, নানা ফুল ফুটে।		
7	ভারি যে কঠিন ঘুড়ির চাল,		
8	সাধ্যি কি চিল পায় নাগাল!		
9	প্যাঁচ লেগে ঘুড়ি কেটে পলায়		
10	আকাশের কোথা কোন কোণায়।		
11	ঘুড়িরা পড়িছে হাতেতে কার,		
12	খবর রেখেছে কেউ কি তার?		
13	ভাইবোন সকলেরে যেন ভালোবাসি,		
14	এক সাথে থাকি যেন সবে মিলেমিশি।		
15	ভালো ছেলেদের সাথে মিশে করি খেলা,		
16	পাঠের সময় যেন নাহি করি হেলা।		
17	সুখী যেন নাহি হই আর কারও দুখে,		
18	মিছে কথা কভু যেন নাহি আসে মুখে।		
19	সাবধানে যেন লোভ সামলিয়ে থাকি,		
20	কিছুতে কাহারে যেন নাহি দিই ফাঁকি।		
21	ঝগড়া না করি যেন কভু কারও সনে,		
22	সকালে উঠিয়া আমি বলি মনে মনে।		
23	ঘুড়িরা উড়িছে হালকা বায়,		
24	একটু পড়িলে টান সুতায়		
25	আকাশে ঘুড়িরা হোঁচট খায়।		

English regular sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	I beg your pardon.		
2	Would you please speak slowly?		
3	That’s so kind of you.		
4	Nice to meet you.		
5	I will try my level best.		

6	How dare you?		
7	Can you turn the volume up?		
8	Do you know what I mean?		
9	Where are you from?		
10	Please come as soon as possible.		
11	Do you understand me?		
12	You are wasting my time.		
13	Where are you going?		
14	May Allah bless you.		
15	I am busy at the moment.		
16	When is the train leaving?		
17	I just made it.		
18	What's the weather like?		
19	You are driving too fast.		
20	Stop making so much noise.		
21	Slow down your car.		
22	I feel much better.		
23	Is everything okay?		
24	Do you want to join me?		
25	How was your weekend?		

English rhyming sentences

Serial No.	Sentences	No Difficulties	Difficulties
1	Star light, star bright		
2	The first star I see tonight		
3	I wish I may, I wish might		
4	Have the wish I wish tonight.		
5	I'm a little teapot		
6	Short and stout		
7	Here is my handle,		
8	Here is my spout.		
9	When I get all steamed up,		
10	I just shout		
11	Tip me over and pour me out.		
12	See saw, Hurry Up and Down		
13	Which is the way to London Town?		
14	One Foot Up and The Other food Down,		
15	That is the way to London Town.		
16	Hey diddle diddle,		
17	The cat and the fiddle.		
18	The cow jumped over the moon.		

19	The little dog laughed.		
20	To see such spot.		
21	And the dish ran away,		
22	With the spoon.		
23	Little Jack Horner sat in the corner		
24	Eating his Christmas pie,		
25	He put in his thumb and pulled out a palm.		

Appendix 4: Questionnaire for teachers and parents (Semi- Structured)

Name of participants:

Age:

Gender :

Relation with student:

Contact number:

Serial No.	Statements	Always	Sometimes	Few	Never
1	Enjoy at coming school				
2	Slow reading				
3	Slow writing				
4	Confusion between left and right				
5	Memorized ability				
6	Scattered handwriting				
7	Spelling mistake				
8	Confusion with capital and small letter				
9	Hearing problem at class				
10	Enjoy playing with peers				
11	Feelings of carrier				
12	Time counting problem				
13	Time management knowledge				
14	Name related problem				
15	Feelings of others emotion				
16	Problem of identifying similar words				
17	Counting problem				
18	Confusion among + - * /				
19	Having trouble solving math words				
20	Trouble of summarizing narrative				
21	Skip tendency during reading				
22	Common Punctuation identification problem				
23	Slow reading of rhyme				
24	Misreading multisyllabic words.				
25	Enjoy Playing outdoor games				
26	Enjoy Playing mobile games				

Appendix 5.A: Consent Form

Consent Form

Study Title: Mainstreaming Slow-Pace Learners through Mobile Assisted Language Learning: A Case of Bengali Primary Level Students with Dyslexia.

Name and Designation of the Researcher: Md. Sahajalal Badsha, M.A second semester, Department of Linguistics, University of Dhaka. Purpose of the thesis: The main objective of this thesis is to bring the Bengali Primary level students with dyslexia into mainstream through Mobile Assisted Language Learning.

Methodology: Using Qualitative method.

Duration of the thesis: 5(five) months.

Contact: mobile: N/A

E-mail: N/A

Certificate of Consent

I understand the nature and objective of the research and I am realized that my students/son/ daughter will not be harmed in any way by participating in this study. The information has been read to me. I have had the opportunity to ask questions. The purpose and procedures of the study are clear to me. I have received a copy of this consent form for my records.

Name in full.....

Date of birth.....

School.....

Signature of the participant.....

Signature of the guardian.....

Signature of the school Head Teacher.....

Statement by the researcher

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the requirements of the study as outlined in the Information Sheet.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the teacher or guardian have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant. YES/ NO.

Name of the researcher.....

Signature of the researcher.....

Date.....

Signature of thesis Adviser..... .....

Signature of Department chairperson.....

Appendix 5.B: Dyslexia testing permission application from department of Clinical Psychology, University of Dhaka

Date:
To
The Chairman
Department of Clinical Psychology
University of Dhaka
Dhaka -1000
Through: The Chairperson, Department of Linguistics, University of Dhaka
Subject: Application for getting permission to test learning disability for research purpose.
Dear Sir,
With most respect I would like to inform that I am a student of Masters 2nd semester of department of Linguistics, University of Dhaka. I have been doing my thesis with the title of "Mainstreaming Slow-pace Learners through Mobile Assisted Language Learning: A Case of Bengali Primary Level Students with Dyslexia" with the supervision of Dr. Monira Begam who is an associate professor of the department of Linguistics, University of Dhaka. For my thesis, I have selected some children of grade three of a primary school near Nilkhet area who have the symptoms of learning disability but I need to confirm to avoid the ethical consideration whether they have really learning disability or not. I have taken the permission of my department Chairperson, Supervisor and the Head-teacher of that school. I have also attached my consent form here.
May I request you to consider my application and help me to test these seven children and allow me to continue the further procedures of my thesis.
Thank you.
Sincerely,
Researcher name: .....….....
Master's second semester
Exam Roll: 38129
University Registration: 2016-018-543
Department of Linguistics, University of Dhaka
Signature of Chairperson: .....
Signature of Supervisor: .....
Signature of Head- teacher: .....
Recommendation from the Chairman, Department of Clinical Psychology, University of Dhaka.....