

Bachelor of Science in Computer Science & Engineering



Bangla Alphabet Learning Game for Children

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Submitted in partial fulfilment of the requirements for
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Abstract

The interest towards game-based learning (GBL) is continuously growing worldwide. However, several countries still face difficulties to efficiently implement GBL approaches in their Educational Institutions. This literature review is focused on the identification of the main types of GBL approaches that have been recently implemented in educational contexts, by providing one representative game-example for each case. A qualitative content analysis is used to investigate the general characteristics of the identified GBL types and the representative example-games, as well as the main benefits and drawbacks that render GBL implementation impracticable in several countries. Overall, this study contributes in the research attempt towards the recognition of the main GBL types, focusing on their drawbacks or other features that seem to affect their broad implementation in several countries and educational contexts. Bangla Alphabet Learning Game for Children AR is an Augmented Reality Application for Android devices which provides a better and easy way to learn Bengali alphabets. This application is developed targeting the children of age 3 to 7 of Bangladesh, to make them more familiar with their mother language. The last decade has seen a phenomenal growth in digital game-based learning. As a core constituent of the serious games movement, educational video games present the prospect of combining learning with the inherently motivating medium of games. Some of the best educational apps have been created to serve as an additional resource for students participating in more structured education programs. Our project aims to provide self-motivated students with options for learning in gaming environment. The proposed application allows students to ask and answer questions, answering more and more questions will allow the student to get higher level and marked with some distinguished badges. The burgeoning growth of the entertainment games industry and the increasing prevalence of smart phones and tablet computers have shifted the expectations of learners. As a result, learning environments that are highly interactive and visually stimulating are now increasingly desirable. DGBL

is a learning approach, which incorporates the use of digital games for exploration or practice of an educational content that integrates learning principles while engaging students into the game environment . Since digital games enable students to gain skills needed in an information-based culture and to learn innovatively, the interest in learning games has considerably grown within the last decade. We hope that today's children have the same interest in school as they do in video games. They are competitive, inquisitive, motivated, persistent and seek out new information when it comes to playing video games. It has been found that, without the application, the average learning efficiency is 41.67 percent per week whereas with this application the learning efficiency becomes 58.33 percent per week with 17

Keywords— Augmented Reality, Digital Game Based Learning, Android Device, Bangla Alphabets, video Games

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Chapter 1

Introduction

1.1 Introduction

The Bengali is the 7th most spoken native language in the world where around 300 million people communicate in this language[1].It is one of the very important languages in which literature enriched itself the most.This language has developed from a form of Prakrit.According to the statistics of CIA and from the catalog of world language called “Ethnologue” which was published by SIL International which said that 1.99 percent of world’s literate population is Bengali speaker.Moreover,12 percent of world information is produced in this language.Despite the huge population who speak Bengali around the globe,there is not an adequate amount of material to learn this language at early childhood.In addition,the number of Bengali speaking people is dropping day by day because colonial conquest,urbanization, death of speakers,standardization and the growth of electronic communication.Increasing the number of working women is also considered one of the reasons behind the unavailability of language education at home.At present 19.2 percent of the workforce in Bangladesh is women who get less time to teach their children by themselves and have to depend on schooling,different learning TV shows or smart device applications.Fathers are generally absent in Bangladeshi context in the upbringing of a child.Since people mostly emphasize on proficiency on English,schools prefer teaching English rather than Bengali.Besides,children cannot learn by their own as materials of Bengali learning are not easy reachable.'Over the years gaming has grown dramatically in popularity and it's now become an everyday habit for many people, particularly children,' said Gary Davis, chief consumer security evangelist at McAfee.'There

are many advantages to playing video games, and they can be a great tool at parents' disposal during the summer months where they need to keep their children entertained while trying to manage everything else,' Davis continued. Mobile game for learning or mobile educational game(Game Based Mobile Learning - GBML) is a game specifically utilized for learning which is also played on a mobile phone, smart phone, PDA or handheld devices. Similarly to game-based learning, the main aim of GBML is to use game play to enhance motivation in order to learn, engage in knowledge acquisition, to enhance effectiveness of learning content transfer or other specific learning outcome[2]. Developing a good educational game is very important in ensuring the learner is motivated enough to keep playing the game until the game (educational) goal has been achieved. Mobile educational games are designed to enable learners to play games "on the go" while mobile. The impact that the use of mobile devices has on the mobility of the user is a critical factor to the success or failure of the application.

1.2 Motivation

Nowadays, more and more students grow up using devices like computers, mobile phones, and video consoles for almost any activity. On average, young people spend 7 hours a week on playing games . Therefore, it is very crucial to motivate and engage young learners into learning activities by transforming the traditional teaching methods such as lectures and written materials in more digital form, like games that seem to attract their interest. Computer and video games let students dive in practice lead them to expertise by gaining professional skills and acquire innovative thinking. Digital games are the perfect tool that supports learning to students without even realizing it. These games use virtual words and symbols through which students can experience the concrete facilities that these words describe. In that way, youngsters can understand the complex concepts without losing the connection between abstract ideas and the authentic problems that can be used to solve. In order to delve deeply into the conversation, it is essential to clarify what Game-based learning (GBL) is. Overall GBL is a type of education that provides learning through video games in order to teach a specific skill or

achieve a specific learning outcome. Students take in information from many sources and make decisions quickly. It takes your core content and objectives and makes it fun. Video games use design patterns, principles and data in order to deploy new learning opportunities and environments[3]. Game-based learning is an innovative approach that uses computer games which offers educational value using different kinds of software applications, to succeed teaching enhancement, assessment and evaluation of learners. This process includes elements of competition, engagement, and immediate reward. Learners can compete with each other and collaborate in order to be motivated to achieve a specific goal and succeed high scores. Then they receive immediately feedback and rewards. This kind of challenge motivates and engages students to learn by completing series of activities[4]. Children always like interesting things and want to play games. Now a days almost every family members use android mobile or tablet or laptops. Children are always interested of this kind of digital device. So Digital Game Based Learning can be helpful for children to learn in effective way. Without that in present days our family women are going to outside jobs and returning at late night. So they cannot teach their kids properly. In this stage DGBL can be helpful for them. Game-based learning can be seen from two different perspectives - the learning and the gaming perspective – and consequently, the motivation to use an educational game depends on the motivation to play the game and/or on the motivation to learn about the related domain. Since the motivation to play is the crucial advantage of game-based learning over traditional instruction, it is only natural that researchers frequently focus on this motivational component as a key aspect of instructional games. The main target of this project is to help our parents to teach their kids in effective ways by playing games. So that our future generation can learn Bangla in early stage is the main focus of this project.

1.3 Design Overview

The construction of the game must follow specific rules in order to be suitable for the group of children to whom it is addressed. The type and the purpose of the game must be carefully determined and tested by the teacher himself, to see

if learning goals are achieved. Moreover, the parents should be informed about the game. So, this learning method should meet their expectations. In some cases, their participation could be mandatory due to the fact that it is proven by research, that when families and schools work together, children do better. In addition, it would be better if the time for learning through games was plenty enough in order to have very accurate results. In this project my main target is making a game that will be interesting and helpful for basic learning of children to learn Bangla alphabet. For this reason I tried to make it interesting because children always prefer to play games. I tried to use colorful images and wonderful sounds so that children like this and can learn beside playing. I make this project in three parts one is for vowel alphabets, one is for consonant alphabets and other is testing parts. In vowel section they can familiarize with vowel alphabets and images related with that vowel. In consonant section they can learn about consonant alphabets and related image of that consonant alphabets. After learning vowel and consonant section they can go in testing section and check how much they learned by playing testing part. In this way our children can learn easily Bangla alphabets and I think it will be helpful for our kids in future learning.

1.4 Difficulties

In this type of project I face some difficulties because there is not much work found in this category and most of them are for English language. In the sector of Bangla language there is not available work so I face some problem to manage all the things. Collecting voice and image is the main difficulties. In the end I overcome all the difficulties and done my job nicely.

1.5 Applications

The objective of this research is to create an Augmented Reality experience for children of 3 to 7 years that will help them to learn alphabets of Bangla Language in Android environment. As children always like digital device and playing games so we want to use this chance to learn them by playing. Those parents are workers and pass their time in office and they cannot give much time for their children

and this children are our target. This application will be helpful for those kinds of children to learn basic Bangla alphabets. Our main target is to help our children to learn easily and effectively.

1.6 Contribution

The aim of a thesis or research project is to achieve a particular set of objectives, such as defining a new approach or improving an existing one. The main objective of this project is to make an application this will be helpful for our children to learn Bangla alphabets easy and in effective ways. The contribution of this project is: 1. To learn Bangla vowels and related image about that vowel. 2. To learn Bangla consonant and related image about that vowel. 3. In testing section to test how much our children have learned. For this kinds of work I have to collect so many voices and images to make this application interesting. After collecting all the materials and applied in android studio to make this application.

1.7 Project Organization

The rest of this report is organized as follows:

- Chapter 2 gives a brief summary of previous research works in the field of digital game based learning and its efficiency.
- Chapter 3 gives description of proposed methodology. In the proposed methodology , how the application run and works is given. Architectural designed is given is chapter 3.
- Chapter 4 provides results and outcomes and its effectiveness.
- Chapter 5 contains the overall summary of this thesis work and provides some future recommendations as well.

1.8 Conclusion

Our findings demonstrate that even though Bengali is the mother language of the Bangladeshi people, the children are not getting enough exposure to the Bengali language compared to English in their early childhood. This “Bangla Alphabet Learning for Children” app can help to bridge that gap. By using this app children can easily learn Bangla alphabet easily and interesting way. I think this will be helpful for our children in early learning.

Chapter 2

Literature Review

2.1 Introduction

In this project there are three main parts. One is for Bangla vowels, other is for consonant and last part is for gaming and testing parts. As our project is about Bangla Alphabet learning Games for Children so it is quite difficult to find related works. Most of the works are in English language but some work is related about Bangla language. Firstly I have collected all the materials and then applied it in Android Studio to create this application.

2.2 Related Literature Review

Some related works of literature on the motivation of AR and motivation for native alphabets have been reviewed and we have discussed the key points of them in this section.

2.2.1 Augmented Reality (AR)

Since its introduction, augmented reality (AR) has proved its potentiality in making the learning process more active, effective and meaningful. This is because its advanced technology enables users to interact with virtual and real-time applications and brings the natural experiences to the user[5]. Natural commonly accepted definition for augmented reality is based on generating a virtual image on top of a real image, enabling interaction in real-time, seamlessly blending 3D (or 2D) virtual objects with real objects. This interactivity is missing in traditional way of learning. In the past two decades, the applications of augmented reality (AR) have been increasingly receiving attention. AR was first used in the 1990s, when

applications were related to the training of pilots. Eventually, to excel the learning process, AR technology has aroused much more attention in the education sector for last few years. As a motivation of AR, an AR based game application MOW was being investigated where this app was made for enhancing the English vocabulary constructing the 3-D objects of word. It was found that it improved the vocabulary learning process than the traditional way. Another two studies showed that user acceptance of AR implementation in learning vocabulary is highly positive[6].

2.2.2 Digital Game Based Learning (DGBL)

In recent years, there has been a growing interest in the potential of games as instructional tools in areas such as education, health and wellbeing, government, corporate, defense, and communication. Considering that the development and implementation of digital gamebased learning (DGBL) implies a substantial financial effort, there is an increasing need to determine the educational potential of DGBL in order to justify the investment. One major justification of this investment should be well-founded empirical evidence. While in recent years, there has been an increasing number of publications aimed at assessing the effectiveness of DGBL, there is still a lack of sound empirical evidence[7]. The lack of an overarching methodology for effectiveness research on DGBL has led to the use of different outcome measures for assessing effectiveness, varying methods of data collection and inconclusive or difficult to interpret results . Moreover, questions have been raised regarding the validity of current effectiveness research on DGBL. A common methodology for assessing the effectiveness of DGBL would firstly create the opportunity to compare results and thus the quality of the different educational interventions across studies. Secondly, claims regarding the effectiveness of DGBL could be made on a more general level. Lastly, a common methodology could set a baseline for quality, which could serve as an evaluation tool for published studies and as a starting point for researchers desiring to conduct an effectiveness study on DGBL. The present study aims at mapping current research methods used for effectiveness research on DGBL and is a first part of a larger project aimed at the development of a standardized procedure for assessing the effectiveness of DGBL.

2.2.3 Kahoot: A GBL platform popular in Greece

Kahoot is a worldwide known, GBL platform, used by educational institutions, companies and parents, as a method to turn learning into entertainment. The project was founded in 2012 by university students of the Norwegian University of Technology and Science (NTNU). It was launched in 2013 in beta version and when it converted to public, it became successful very soon. Since it was launched, it has been played in all the countries around the globe, from more than 3, 2 billion players[8]. The game design process in Kahoot is a very easy procedure and takes only few minutes. Anyone can create questionnaires and quizzes for any subject, through a user interface, by following easy steps. There are already more than 40 million ready-to-play games offered by Kahoot, inside the platform, for many topics. One very important feature is that the game can be played by smartphones through iOS or Android software, without any difficulty. The majority of Kahoot games follow a specific pattern: the educator creates the game and becomes the ‘gameshow’ host. Learners enter the room by typing the specific game code (PIN CODE), provided by the educator. The game play is accessible through all different devices and easy for all age groups. The player who answers correctly and faster than the other players the questions is the one who wins the game. This creates a sense of competition between the players and this is something that usually attracts the interest of students. Especially, when the educator promises a prize for the winner, this emotion becomes even stronger. At the end of the game, the host can have a clear overlook of the detailed results of the game, in a graph model. Compared to other learning methods, game-based learning and especially Kahoot GBL approach makes learning more entertaining and interactive. The key element which makes Kahoot unique is its easy-to-use interface, combined with catchy music and colors. All in all, Kahoot is one of the most used games for learning, and especially nowadays, during the COVID-19 pandemic crisis, it could be extremely helpful for the teacher work.

2.2.4 Gamelearn: The most awarded game-based learning platform in the world

The Gamelearn platform has been broadly integrated in the business and educational GBL contexts, mainly through start-ups cooperations, in several European countries, including Germany, Greece, Spain and Check Republic. In Greece, the Wide Learning¹ start-up has applied Gamelearn within its moodle-based e-learning solutions to increase e-learning courses completion rates and provide its clients with engaging video-based GBL experiences. Gamelearn develops video games and simulators to train, communicate, inform, and engage learners and employees. It is estimated that Gamelearn-based solutions achieve a 90 percent-completion rate in e-learning courses, contrary to the 30 percent rate achieved by traditional e-learning approaches (Techcrunch, 2018). Gamelearn integration in several projects worldwide has showed to achieve higher levels of learners' confidence, self-control, self-awareness, creativity, teamwork, problem solving and decision making skills[9]. Gamelearn sells internationally and offers its platform in four different languages while the startup's games are translated into dozens of different languages.

2.3 Conclusion

In the above is given some related works about the works. This study presents a brief state of the art about the popular Game-Based Learning approaches that have been recently implemented in educational contexts. Here is given four works related with my application. There are lacking in this related work. Although there are many lacking but I tried to take help and applied their experience in my application. I have taken many help with this works.

Chapter 3

Methodology

3.1 Introduction

In this study, there are two research questions we tried to evaluate. First, how much effort the working parents of Bangladesh put to teach the alphabets of their native language to their children (3 to 7 years old). Second, how this AR Application can excel in the self-learning process of the native alphabets of this focus age group of children. Our application has three part. Vowel, consonant and testing part. In vowel part is about vowel alphabet, in consonant part is about consonant alphabet and in testing part is about playing test. Every alphabet is displayed with graphical representation and with voice representation. By voice representation children can learn rightly the voice and by graphical representation children can learn appropriate image related with alphabet. Children can learn Bangla Alphabet easily by this application.

3.2 Diagram/Overview of Framework

The total methodology includes four main features like alphabetic part, vowel part, consonant part and testing part. Main steps are shown in figure Educational games development process focused on development methodology to produce game based multimedia educational application. An educational game design and development model is developed based on ID and game development methodology. Given figure illustrated the proposed methodology in the form of digital game based learning- ID model (DGBL-ID). Each phase consist of activities which need to be accomplished before moving on to the next phase. The DGBL-ID model consists of five phases, which are analysis phase, design phase,

development phase, quality assurance phase as well as implementation and evaluation phase. Each phase consists of a few steps to be completed. The phases mentioned include all the main activities for instructional part and game part so that the educational game will enable students to learn while they are playing games. Previous research studies showed the models or steps for educational game development, but did not explain details for each phase or step. For DGBL-ID Model, we will test the quality and content of the educational game before we launch to learners. After the quality assurance phase, we will launch the game and do the usability and effectiveness evaluation to make sure that learners learn effectively when they are playing the immersive game.

In alphabetic part is to learn Bangla alphabet in phonetic with image. Here children can learn Bangla alphabet list serially. In vowel part they can learnt vowel alphabet with appropriate images related with that alphabet. In consonant part they can learnt consonant alphabet with appropriate images related with that alphabet. In testing part they can test their learning quality by testing them.

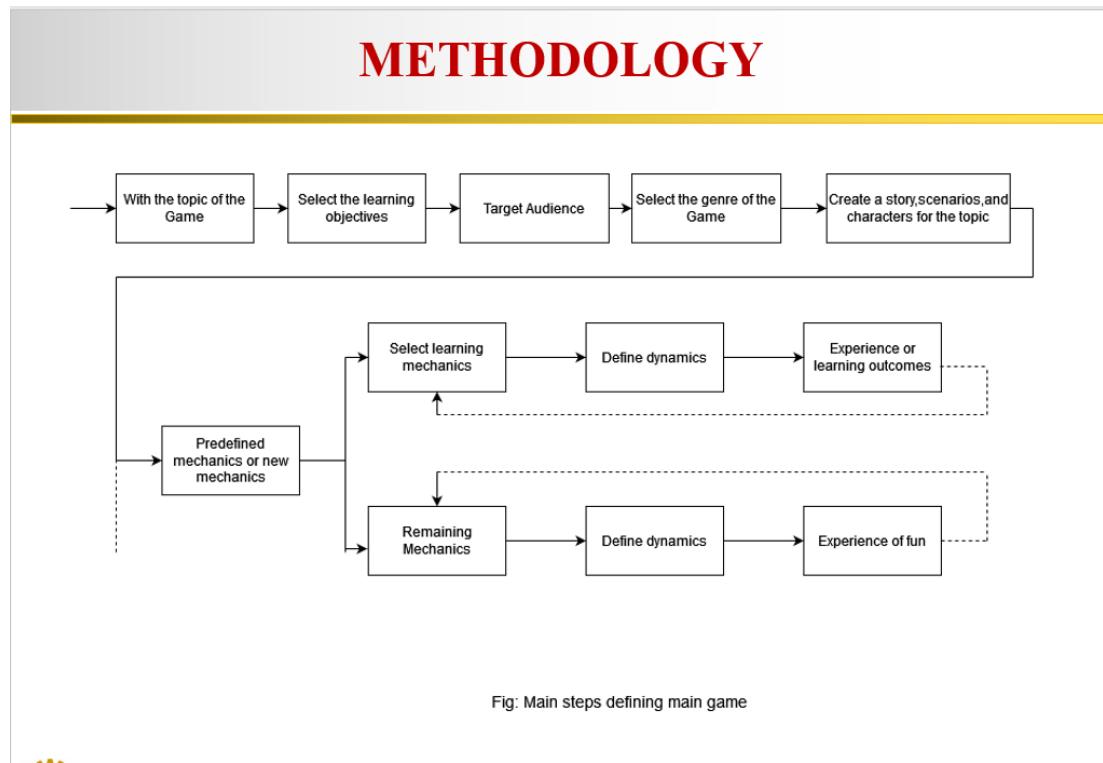


Figure 3.1: Main step diagram of game methodology

3.2.1 Alphabetic Section

In alphabetic section has two parts one is for vowel and another is for consonant. In vowel activity all vowels are displayed serially in cardview features. Under the cardview every letter is connected with audio. When cardview is pressed then the related audio is played. By the pressing every cardview reader can read every letter and can finish the alphabet list. In this system consonant list can be taught.



Figure 3.2: Game Main Activity

3.2.2 Vowel Section

Vowel section is one of the main part of this application. In this section eleven vowel letters are displayed. Each letter is connected with appropriate voice and graphical image. When any letter is selected then the connected voice and image is displayed so that children can easily recognized that letter. This system is interesting for children and they can learn very effective ways. This education is lasting longer. In this system our children can learn all the vowels and learn many of that related animals name easily.



Figure 3.3: Vowel Section Activity

3.2.3 Consonant Section

Consonant section is another section in our application. In this section we worked with consonant letters. Firstly we collect all the consonant letters then all the audios and images related with every consonant letter. By using Android studio we combined all the materials. Then we made our consonant part .In this part children can learn consonant alphabet with appropriate images related with that letters. We did the same things for all the consonant letter. By using this part children can learn all the consonant Bangla alphabet visually and phonographic ways. For developing this part we used XML, Java language in Android Studio software.

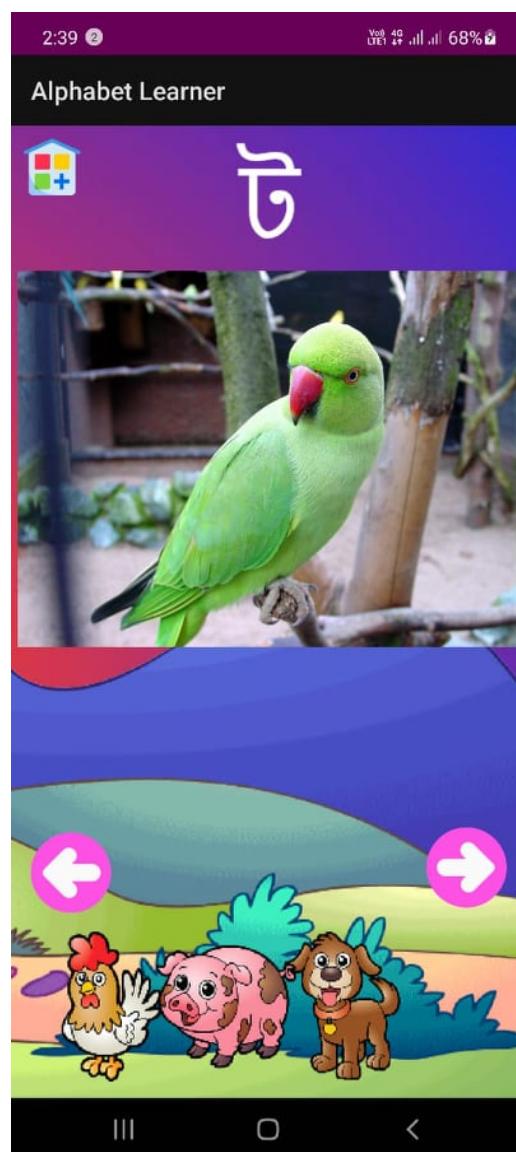


Figure 3.4: Consonant Section Activity

3.2.4 Testing section

Testing section is another important section for our application. This section is for examining the children how much they have learned by using our application. Here we arranged some quiz to examine students. Here they can play a random alphabetic list and they should arrange them serially. If any wrong latter is select that will be the mistake and is counted. Finally we showed them how much mistake they have performed. By using this step any student can check their performance.

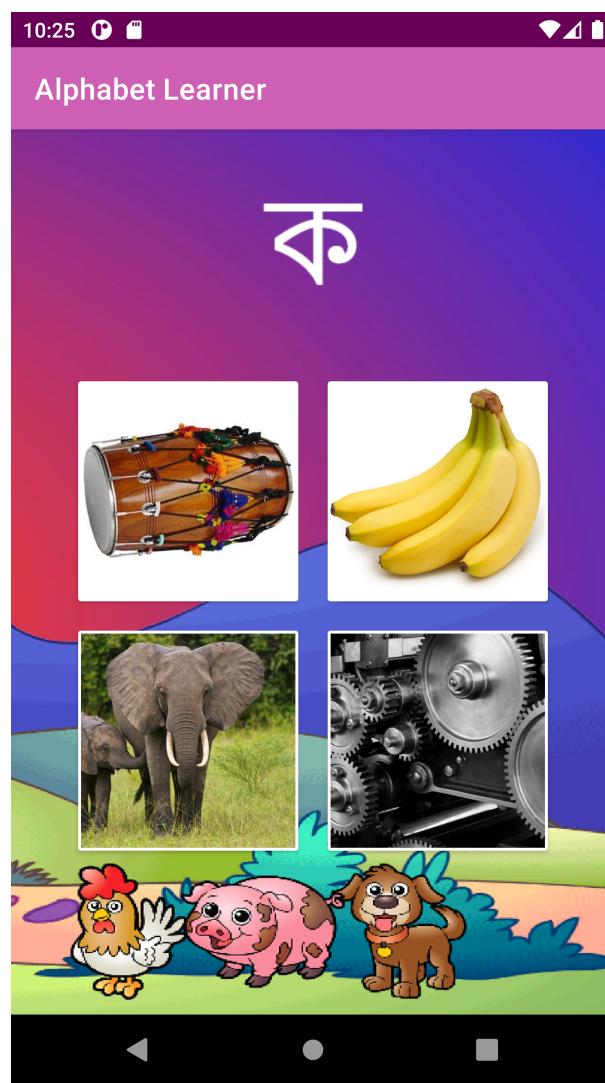


Figure 3.5: Exam Section Activity

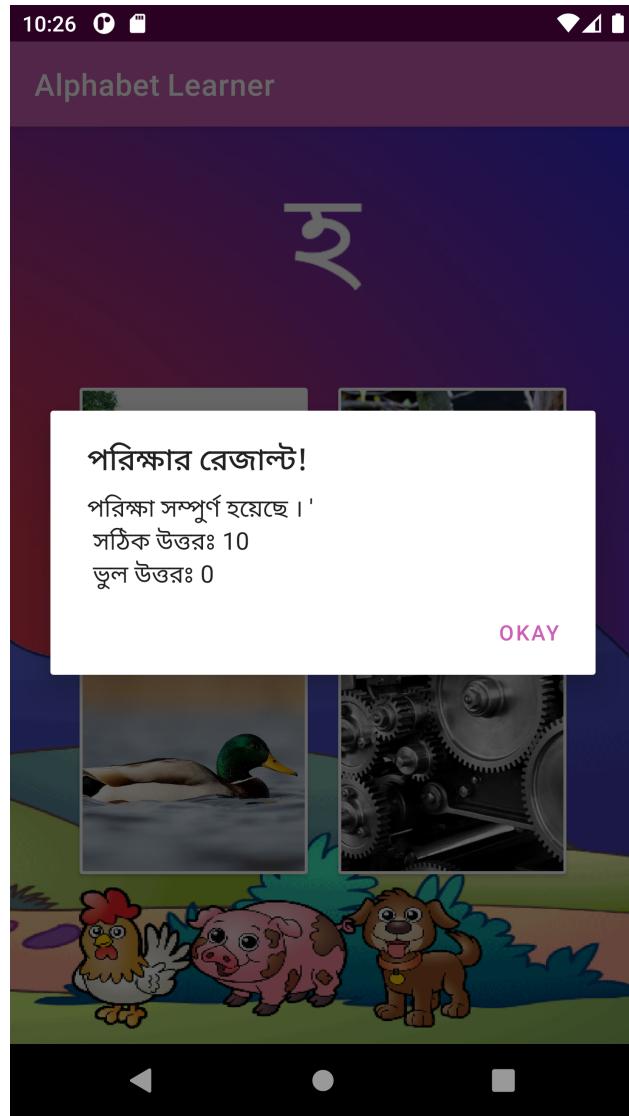


Figure 3.6: Exam Result

3.3 Conclusion

In this chapter we displayed how our work have done. We divided our work in four steps. We showed that in four subsection. Every section has different works and children can learn different things. We showed here how we have done our work. Alphabetic section for learning alphabet. In vowel and consonant section for learning vowel and consonant with voice and image. In exam part for taking exam how they have learned and give the result.

Chapter 4

Results and Discussions

4.1 Introduction

Previous chapter we showed the methodology for developing the application and this chapter is for showing the results and outcome of our application. This chapter is to display the efficiency and performance of our work. How our Application works and how children can learn by our experiment is given here. Benefits and impacts are analysed here.

4.2 Dataset Description

Dataset collection is one of the challenge of our work. It takes so much time. We have to collect fifty audio for all the alphabet series and another fifty audio for the related image of the alphabet list. Without that we have to collect images for the visual learning. We have to make good audio because it is very important for our application. We collect all the data and then import in Android Studio software to use that data. Separate Voice making and image are collect for every alphabet and use them properly. All this assets are stored in assets folder in our program.

4.3 Impact Analysis

Impact analysis is an important aspect for implementing any new framework. It is necessary to observe whether it will do good or bad for the society as well as human ethics. The impact analysis is divided into two parts and discussed below:

4.3.1 Benefits of Game-Based Learning in Education

Video games have a great positive potential and value in the educational field and they can attract children's and adolescents' attention. Games can be utilized as research and estimation instruments. They can likewise help youngsters in defining objectives, guaranteeing objective practice, giving input, fortification, and keeping up records of social change. Also, they are valuable as they can gauge execution on numerous undertakings and be effortlessly comprehended. Besides, these sorts of games can analyze a few learning-related cognitive or affective items like self-efficacy, self-concept, individual differences, etc. They are fun and stand out for people for an extensive stretch of time. In addition, they can hone IT abilities and permit members to encounter oddity, interest and challenge[10]. Despite all the above, there are indeed positive effects that some teachers and parents have already noticed. There are many experts such as William Massy that provide practical guides and created learning games in order to build games that communicate their knowledge and experience (Admiral et al., 2011).

4.3.2 Social and Environmental Impact

Bangla is the one of the spoken language in the world. In our country literature rate is low like developed country. Female education is very low specially in rural area. Most of the village mothers are illiterate and they cannot read or write. So it is very difficult for them to teach their children. Without that in city area womens are very busy for outside work and they don't have enough time to teach their children. As children used to like digital device and almost every family have digital device like Android mobile. So it is a huge chance for us to teach our children by using this kind of digital platform. For this reason we developed our application.[11] Social interactions are not the only skills occurring when using game-based learning within the classroom. There is a direct correlation to academic scores heightening through game-based learning, especially for struggling students. Students with disabilities have a more difficult time connecting with traditional approaches, as discussed before, which is why game-based learning can help alleviate some of the labor students feel from academics. Researchers found

another direct correlation between higher academic outcomes using game-based learning[12]. In the area of mathematics, specifically division and multiplication, students who were in the experimental group played games focused on multiplication and division while the control group was taught with a traditional approach. At the end of the experiment, the experimental group had higher assessment scores than those of the control group. Overall, the positives of game-based learning are apparent. When using game-based learning, educators are able to hold the attention of students, create an interest in the task at hand, and improve student's confidence, especially students with disabilities, as Wajiuallah, Ashraf, and Majad (2018) found during their study about students with intellectual disabilities and number sense. This team of researchers found a direct, positive correlation between the use of games for learning and academic achievement in the area of number sense for students with disabilities. The direct correlation between students achieving higher scores in academic areas and learning how to become respectable employees through social skills learned shows the importance of an engaging, adaptable teaching approach, such as game-based learning.

4.3.3 Ethical Impact

Our developed application is totally ethical and it does not have any bad things or violence. Our application is developed by checking all the ethical things. Now a days children is very addicted to bad things and bad gaming. Our application can be the best way for children to use their time effectively and they can learn Bangla alphabet properly. Cai, Wang, and Chiang (2014)[13] described the goal and objective of ethical instruction as to guide humans doing good and cultivating good cognitive value through education, expecting to present good performance on life events. Kuo and Chao (2014)[14] indicated that ethical instruction enhanced the society, individual responsibility and good personality traits, and moral value with strategic guidance. Molae and Dorts (2015) regarded ethical instruction as teaching activities composed of all education for students, teaching the value with contribution required for life and community interests. Alickovic and Subasi (2016) pointed out ethical instruction as helping students become positive and self -directed people in real life and education processes to make efforts for future

directions. Shahabadi and Uplane (2014) regarded ethical instruction as the long-term process to cultivate good personality of the youth. Good ethical instruction effectiveness should contain the ideas of comprehension, helping each other, fairness, honesty, sympathy, responsibility, and respect to oneself and others. Jin, Zhao, Chow, and Pecht (2014) covered moral education, citizenship education, and personality growth and development in ethical instruction effectiveness to facilitate individuals changing the moral regulation in education and learning in the growth process. Maeng and Lee (2015) regarded ethical instruction as value education. In addition to teaching students knowing, loving, and doing good, it would shape good behaviors as personal characters. Ethical instruction effectiveness was the process internalizing learning contents conforming to social moral standards into habits. Referring to Chao (2016), knowledge, affection, and ability are three major elements of ethical instruction. The measurement of the effectiveness of ethics development contains following dimensions. (1) Instinctive action: Behavior motivation is resulted from physiological impulse to satisfy individual instinct basic needs. The objectives of activities might be moral, but immoral behaviors are performed at the stage. (2) Conventional morality: Behavioral performance following existing regulations in the society. Individual behaviors would be inspected and restrained by groups, and the violation might result in punishment or exclusion. (3) Reflective morality: Being able to criticize existing rules and regulations in the society which are followed after individual thinking. It is the moral behavior with intrinsic wisdom, rationality, and conscience.

4.4 Evaluation of Framework

In this study, there are two research questions we tried to evaluate. First, how much effort the working parents of Bangladesh put to teach the alphabets of their native language to their children (3 to 7 years old). Second, how this DGBL Application can excel in the self-learning process of the native alphabets of this focus age group of children. When developing an evaluation framework for GBL, it seems logical to design the framework from a pedagogical perspective as the entire ideology of GBL is using games to motivate and engage learners,

resulting in more effective learning even at a supplementary level. There are very few evaluation frameworks in the literature that specifically address the effectiveness of GBL from this perspective and ask questions such as: What is the mainly motivation that engaged learners immerse in a GBL environment? How to describe the experience of learner in a GBL environment? What changes had happened after study in a GBL environment? For example, does the GBL environment increase knowledge acquisition or change learner's attitude or aid the formation of new behavior? Based on the previous studies, we developed a refined evaluation framework for GBL. The purpose is to identify what is potentially be evaluated in a GBL application. The GBL can be evaluated in terms of learner's motivation, learner's experience and learning results.

4.5 Evaluation Performance

Evaluation performance of our application is very much important to decide our application is helpful for children or not. So we decide to make a survey and took an outcome. The outcome of our survey is given below:

4.5.1 Participants

To address our two research questions, we have adopted a qualitative approach in two phases and collected data through surveys, semi structured interviews and experiment. In the first phase, we have conducted surveys of 16 working parents (not disclosing the gender) where the goal was to ascertain the enthusiasm that the parents have to teach their children the Bengali Alphabets. There was also numbers of semi structured interviews with these parents. The participants were recruited through personal contacts, snow balls and purposive samples. Most of the interviews were done through phone calls and video calling. For the second phase, we have conducted an experiment on two groups of children of age three to seven. The first group consisting ten children was taught in the controlled environment of using the "Bangla Alphabet Learning Game for Children" application and the other group of ten children was taught by traditional way. After one week, both groups were assessed by separate oral tests and their performance

was measured. The selected children were all preschoolers who had no learning experience of Bengali alphabets before the experiment was done in the school. Both of these groups were recruited from two different preschools of underrepresented children where their fathers are mostly rickshaw-pullers, day laborers and garments workers. Their mothers are mostly working as ready-made garments workers or maids. In figure given below the parents' occupations of the selected group of children have been shown.

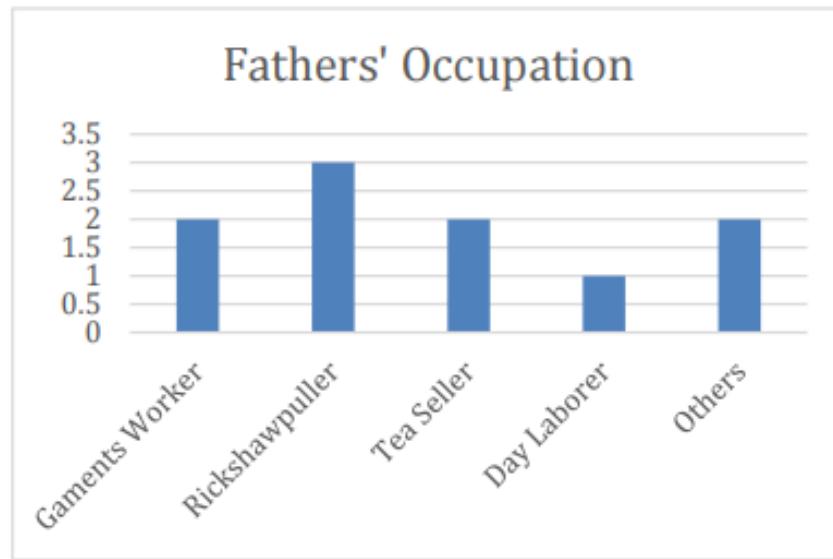


Figure 4.1: Father Occupation Survey

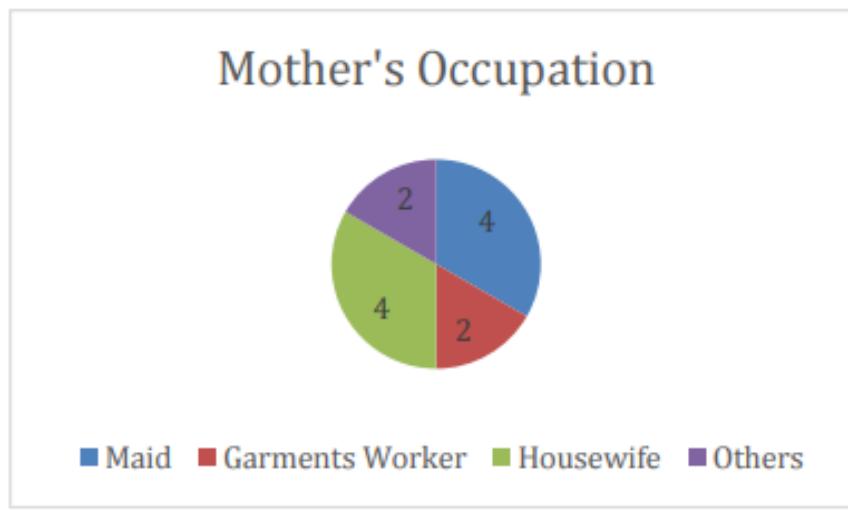


Figure 4.2: Mother Occupation Survey

4.5.2 Survey(n=16)

For the first phase of the study, the survey questions included how much time they devote to teach their kids, do they teach their kids every day or not, what percentage of that period of time they give to teaching Bengali language and what method of teaching they prefer to justify the necessity of this app.

4.5.3 Application Evaluation (n=20)

In the second phase, we have selected 10 kids randomly from the first preschool after one week of time who were taught the “Bangla Alphabets” using our “Bangla Alphabet Learning Game for Children” Application. The teacher conducted a test among these 10 kids where they were asked to find specific six vowels from the list of eleven vowels. We have also conducted the similar test in another same type of school where we selected another 10 kids. In this second school, they were taught Bengali vowels also for the same amount of time. They were taught the “Bangla Alphabets” in conventional way. A test was conducted in the same way to find out how many vowels they can recall by asking each kid to identify same number of vowels. All test were conducted within their own classrooms by the class teachers who used to teach them previously.

4.5.4 Analysis the Result

From the first phase of our study, we measured the practice of working parents to teach their children of age 3 to 7 the native alphabets. It came out, among 16 parents, 62 percent don’t teach their kids every day. Moreover, the parents who teach their kids everyday spent only 1 to 2 hours on average a day where very less percentage of that time is for teaching the native alphabets. It has been found that only 10percent of the time is devoted by the parents to teach their kids Bengali. Around 75 percent of respondents said that they want their kids to learn by themselves. In figure below the findings of our phase one study are shown. In the second phase, the children of two underprivileged school were taught the Alphabets of Bengali language for one week. There are 11 vowels in Bengali Language and the children were asked to identify random 6 out of

those 11. From the assessment, the average number of alphabet recognition in the school that used our app is 3.5 letters while the average number of alphabet recognition in the school that didn't use our app is 2.5 letters. In figure below the results of the vowel test of two different children group have been shown.

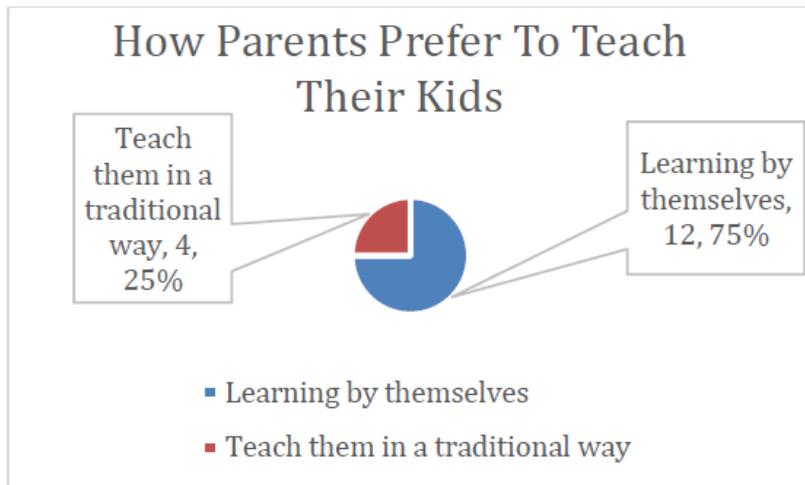


Figure 4.3: Prefer to teach their children

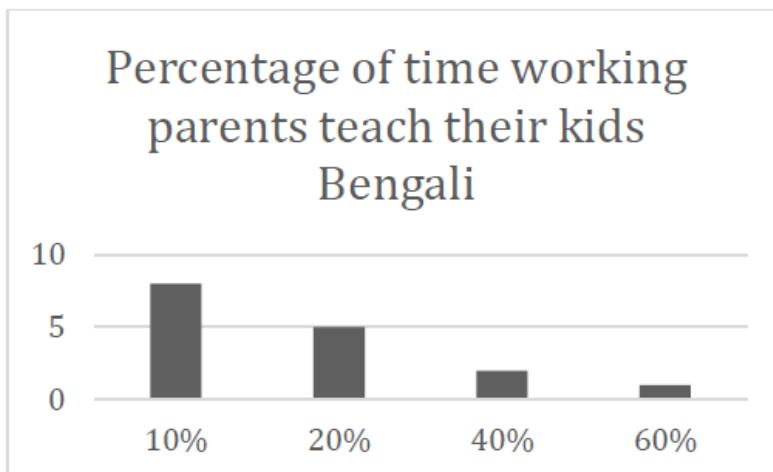


Figure 4.4: Survey of Working people teach their children

4.6 Conclusion

From the first phase of our study, it has been found that most of the parents don't get the opportunity in regards of time and interest to teach their kids Bengali. Mostly, children in Bangladesh other than being in school, learn by themselves using tabs and smartphones. At the same time, the parents prefer that kids learn by themselves (75percent from our survey) using tabs and smartphones as it keeps them busy learning. So, an DGBL app can be a better solution for their

self-learning. The research results reveal that proceeding experiential learning of ethical instruction with digital game-based teaching could improve students' behaviors and remind each other when other classmates make mistakes. Especially, students become considerate and helpful and could active concern about other students and provide assistance, the class coherence is enhanced, learning climate gets better, and the conditions of peers attacking each other with languages are improved. Proceeding experiential learning with digital game-based teaching could present positive effects on participants' ethical instruction. In addition to preset curriculum projects, accident events in lessons could be the material of opportunity education to reinforce students' concept of ethical instruction and behavioral learning. With digital game-based teaching teams, team members could exchange opinions and share experience to help promote course quality and achieve co-growth of the team. Besides, reducing the changes of course field and uncertainties to the lowest in the course practice could enhance participants' attention.

Chapter 5

Conclusion

5.1 Conclusion

Our findings demonstrate that even though Bengali is the mother language of the Bangladeshi people, the children are not getting enough exposure to the Bengali language compared to English in their early childhood. Our application is to ensure that our children can learn Bangla language properly. As women are going to work outside and they don't get much time to teach their children. This decade is digital and almost work are done by digital system. Education is also going to under the digital device. So it is the proper time to use this chance to teach our children. It is the main reason to develop our application. I think our application can help our children to self study and make them educated.

5.2 Future Work

There is not much work on game based learning. And the works found on it has much limitations. In this application we have tried to overcome such limitations. In this application we try to help our children to self educated. Our application is for learning Bangla alphabet. In our application we try to teach all the Bangla alphabet easy and effective way. After learning we try to examine them by testing how much they have learned. For this type of learning we used voice and images so that children can learn easily and this type of education lasting long. We have so many scope in this sector and this age is digital age. Our children waste so much time by playing harmful game so it is our duty to proper use of our children early age. So in future we will try to more work about this sector. In here we made Android Application and in future we will develop for IOS and for PC. We will

add more features such as “Hand Writing”, “Poems”, “Bangla Novels”, “Familiarize with Animals” and so many features. We will work more about this to make more useful and more effective learning application.

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