Chapter 23

SMART Autistika: Mobile Game Application with Chatbot for the Learning of Autistic Children

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ABSTRACT

The design of applications tailored to each user's capabilities is an important modern software engineering task. Children with spectrum disorder and intellectual disability are specific users where the traditional application design is not a successful solution. Today's estimates indicate that more than a billion people, including children, have specific disabilities. This negative phenomenon contributes and needs to overcome some of the limitations of both patient's and their families' lives. New technology and interactive resources are an excellent way to help young children's cognitive psychological, mental, physical, and linguistic development. About 50% of children with autism display deterioration in their current growth and have difficulties with all language forms due to impaired communication. Also, since they do not have verbal and nonverbal communication skills, contact and communication with Autistic children are difficult. Proper teaching techniques are one of the alternatives to help students learn. If teaching techniques match the student's choice style, the learning process will become more accessible, natural, and the learning time will also be reduced. The autism learning process can also be improved using visual support because they have higher visual capabilities than normal children. Therefore, by using the right teaching techniques and learning the style of Autism, children can improve their skills and knowledge. Combining multimedia elements in mobile applications can help Autism enhance its learning skills. This study focuses on developing Autism children's game applications with that chatbot using AI technology against Autism children characterized

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by low-level Autism. This study focuses on how Autistic children can focus on learning using visuals or games. That chatbot will also help teachers solve problems related to Autism; this is because the chatbots have been trained to answer some things associated with Autism children and the types of therapies available today. As a result, children can improve their social aptitudes and keep up associations with the AI-based device. Kids with Autism feel more comfortable and open with AI and robots than other people because when it comes to emotional communication, robots are less complicated than humans and are somewhat similar to toys for them. For autistic children, technological advancements such as artificial intelligence play an important role in enhancing their capabilities and learning how to interact with others and reach them to their maximum potential in a comfortable way.

Key Words: teaching, skills, artificial intelligence, multimedia

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The design of applications tailored to each user's capabilities is an important modern software engineering task. Children with spectrum disorder and intellectual disability are specific users where the traditional application design is not a successful solution. Today's estimates indicate that more than a billion people, including children, have specific disabilities. This negative phenomenon contributes and needs to overcome some of the limitations of both patient's and their families' lives. New technology and interactive resources are an excellent way to help young children's cognitive psychological, mental, physical, and linguistic development. About 50% of children with autism display deterioration in their current growth and have difficulties with all language forms due to impaired communication. Also, since they do not have verbal and nonverbal communication skills, contact and communication with Autistic children are difficult. Proper teaching techniques are one of the alternatives to help students learn. If teaching techniques match the student's choice style, the learning process will become more accessible, natural, and the learning time will also be reduced. The autism learning process can also be improved using visual support because they have higher visual capabilities than normal children. Therefore, by using the right teaching techniques and learning the style of Autism, children can improve their skills and knowledge. Combining multimedia elements in mobile applications can help Autism enhance its learning skills. This study focuses on developing Autism children's game applications with that chatbot using AI technology against Autism children characterized by low-level Autism. This study focuses on how Autistic children can focus on learning using visuals or games. That chatbot will also help teachers solve problems related to Autism; this is because the chatbots have been trained to answer some things associated with Autism children and the types of therapies available today. As a result, children can improve their social aptitudes and keep up associations with the AI-based device. Kids with Autism feel more comfortable and open with AI and robots than other people because when it comes to emotional communication, robots are less complicated than humans and are somewhat similar to toys for them. For autistic children, technological advancements such as artificial intelligence play an important role in enhancing their capabilities and learning how to interact with others and reach them to their maximum potential in a comfortable way.

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1.   INTRODUCTION

Proper teaching techniques are one of the alternatives to help students learn. If teaching techniques match the student's choice style, the learning process will become

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more accessible, natural, and the learning time will also be reduced (Warber, 2020). The autism learning process can also be improved using visual support because they have higher visual capabilities than normal children (Meadan et al., 2020). Therefore, by using the right teaching techniques and learning the style of Autism, children can improve their skills and knowledge. Combining multimedia elements in mobile applications can help Autism enhance its learning skills. For example, according to Meadan et al. (2020), Mobile devices can help students with Autism concentrate and ignore all the confusing inputs around them because they can find something to control the visual. Referring to Wei et al. (2018), many applications available in the communication domain today aim to develop Autism children's vocabulary skills further. Still, such applications do not improve communication skills where they will be achieved if the interactive process is done continuously while playing this application game. This study focuses on developing Autism children's game applications with that chatbot using AI technology against Autism children characterized by low-level Autism. This study focuses on how Autistic children can focus on learning using visuals or games. That chatbot will also help teachers solve problems related to Autism; this is because the chatbots have been trained to answer some things associated with Autism children and the types of therapies available today. This study's motivation is to significantly enhance the participation and learning of autistic children and help them contribute to society and community. There is a solid need to target and encourage learning and social communication in autistic students, as they offer associations, networks, and surely the world. Artificial intelligence will help teachers be used in chatbot development to assist teachers.

2.   LITERATURE REVIEW

According to Atbaşoğlu (2020), Autism is a lifelong disability. Based on Kanner's observations on 11 Autistic children, Kanner found some common characteristics, namely desire or ability, such as extraordinary memorization ability that can be done spontaneously. Things like this are likely to be influenced by the environment, such as electronic media, radio, and television. Gaigg (2012) saw four children who showed social interaction problems and only showed facial expressions as usual to what was presented, i.e., facial expressions that showed no interest in something. The study results found that Autistic children find it challenging to ascertain the facial expressions of a claim they have. The descriptions put forward by Atbaşoğlu (2020) and Gaigg (2012) use the term Autism to describe the main problem that children like to be alone, the difficulty in responding, and the barriers to language skills and social relations. To date, there is no real cause for this Autism disorder, and no prevention and treatment methods have been found to treat Autism syndrome. Autism is also considered a disease caused by psychological factors. Several neurological studies have shown that abnormalities cause Autism in the brain (Hatfield et al., 2019). In recent years, the use of chatbots has developed rapidly in several fields, including marketing, support systems, education, health care, cultural heritage, and Entertainment (Adamopoulou & Moussiades, 2020).

Six existing mobile application were reviewed. These existing applications can improve the developmental skills of autistic children, such as language, imagination, and fine motor writing. But there are still drawbacks because there are no elements of Artificial Intelligence Learning. Various applications are developed to assist Autistic children in their learning and how Autistic children are attracted to visual activities. However, the study that will be conducting focuses on Autism children in primary school. This study found out how game application development guidelines with chatbots can help in app development after completing this section. It can also attract the attention of Autism children and help them

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understand the purpose of learning; in the classroom or outside the school as at home; with monitoring from teachers and parents, this study's objective will be fully achieved if all parties cooperate by helping them. The learning effect using visuals or applying this game can be used as a therapy for children with Autism. The approach used in this study is play therapy through the application of games during the learning of Autism children. The chatbot function can also add value to this application. This chatbot function can help teachers and parents to learn more about Autism syndrome.

3. METHODOLOGY

The method used to develop the mobile application consists of a comprehensive plan that outlines how such software can be added, maintained, replaced, updated, or further enhanced (Usha Rani, 2017). The system development life cycle (SDLC) period will improve the software's quality and the overall development process. A flowchart is a type of diagram representing a workflow or process Figure 1 will explain the process for the development of this application.
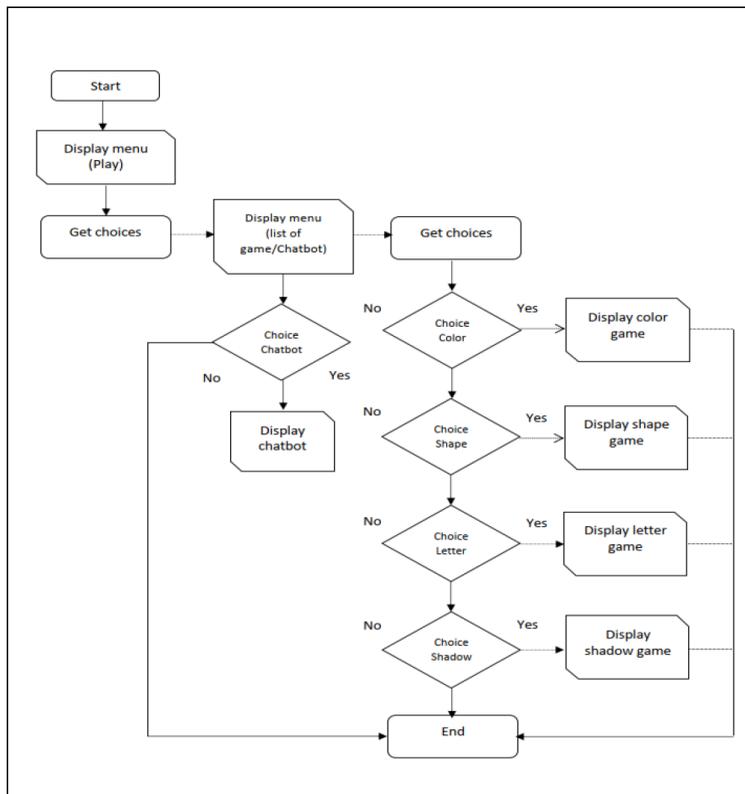

Figure 1: Flowchart of this mobile application with a chatbot

4.   RESULTS AND DISCUSSION

This mobile game for autism with chatbot application starts with displaying the main interface and then proceeds with the menu. The user can make choices in this MENU such

a learn colour, learn the shape of the object, learn the alphabet, learn to match the shadow, and choose the chatbot to find the related information on autism. Figure 2 shows the storyboard flow details for this application's function. The first interface is a welcome activity, opening the apps, have an image is an intro activity explaining the intent of the app along with three options. For chatbot activity at the right button: the text button (Chabot's icon) will appear after user click the icon, users can ask any question, and the chatbot will answer the user's questions about Autism. The game stage activity has four exercises; first, is to learn about color-matching with a start button, second exercise allows learning the shape with a start button, third, for letter match with a start button, and fourth, is for matching the shadows with a start button to start the exercise. When the user clicks the shape matching exercise's start button or any exercise in this apps, the following exercise occurs on the screen; it has three options on both sides of the screen to match each other; users can select any shape/color/image from left or right by clicking on it and moving towards the same n the opposite side. After completing the exercise, it shows the results with a cheer up.
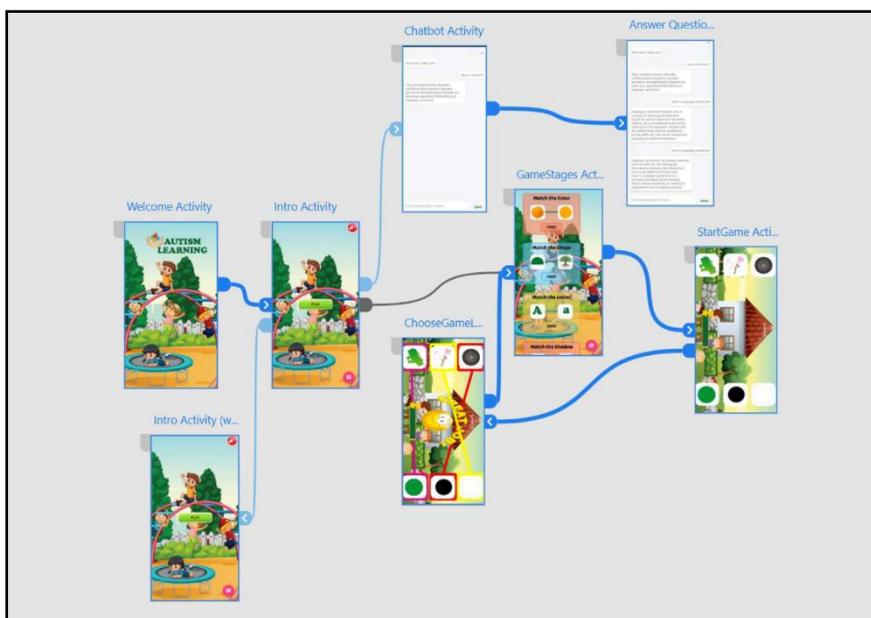

Figure 2: Storyboard of mobile applications.

5. CONCLUSION

This study has to identify the features and functionality; before making any model, this project needs preliminary studies, information from the previous articles, determining objectives, and needed improvements. Integrated the chatbot to autism games application and also testing the effectiveness of Chatbots using AI technology in the mobile application for teacher assistants on Autism child information bases on questionnaire feedback from teachers needed. A chatbot is merely a computer program that fundamentally simulates human conversations, is programmed to work independently from a human operator to help the students effectively. In the future, the main focus is to overcome those limitations, first on research; Make more sets of questions with pictures and avatars. Applying other algorithms like SVM, logistic Regression of machine learning to check if the accuracy will improve or not. If needed, this project shall redesign the model. That also gives a better

result with accuracy. Second, on development improvement. Make a video-enabled model, which can watch the video, record, and. Develop some beta programs to gain some reviews. By adding some history of Malaysia, then can teach them the glorious history and culture of Malaysia. This application is for Android users, and the focus is too available for iOS.

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