AUTILLIGENT – A Game based learning application for autism

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Abstract

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by challenges in social communication, interaction, and repetitive behaviors. Educators and therapists continually seek innovative approaches to support individuals with ASD in their learning and skill development.

Game-based learning (GBL) has emerged as a promising avenue for addressing the diverse needs of individuals with autism, offering engaging and interactive platforms that can facilitate learning and development across various domains. This paper introduces a novel game-based learning application designed specifically for individuals with autism, highlighting its potential impact on enhancing educational outcomes, social skills, and overall quality of life. Through a review of relevant literature and theoretical frameworks, this paper elucidates the theoretical underpinnings of GBL in the context of autism intervention, discusses key considerations in the design and implementation of GBL applications for individuals with ASD, and presents empirical evidence supporting the effectiveness of GBL in promoting learning and skill acquisition in this population.

Furthermore, practical implications and future directions for research and practice in the field of game-based learning for autism are discussed, emphasizing the importance of interdisciplinary collaboration and individualized approaches to maximize the benefits of GBL for individuals with ASD.

Keywords: Autism Spectrum Disorder, Game-Based Learning, Educational Technology, Intervention, Skill Development.

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by a wide range of challenges in social communication, interaction, and behavior. Individuals with ASD often exhibit strengths and weaknesses across various domains, requiring tailored approaches to support their learning and development. Traditional teaching methods may not always effectively engage individuals with autism or address their unique needs, prompting the exploration of alternative educational strategies.

In recent years, game-based learning (GBL) has garnered increasing attention as a promising approach for enhancing educational outcomes and promoting skill development in individuals with autism. GBL leverages the inherent motivation and engagement of gameplay to create interactive and immersive learning experiences. By integrating educational content within a game environment, GBL offers opportunities for individuals with autism to acquire and practice skills in a contextually relevant and enjoyable manner.

The use of GBL in autism intervention is grounded in theoretical frameworks such as constructivism, which emphasizes active learning and knowledge construction through meaningful interactions with the environment. Games provide a dynamic platform for learners to explore concepts, solve problems, and collaborate with others, fostering the development of critical thinking, communication, and social skills.

This paper introduces a novel GBL application specifically designed for individuals with autism, aimed at addressing their diverse learning needs and promoting positive outcomes across cognitive, social, and emotional domains. Drawing upon insights from research in education, psychology, and technology, this paper explores the potential benefits of GBL for individuals with ASD and discusses key considerations in the design and implementation of GBL interventions.

Literature survey

The paper “ Autism Assistant: A Platform for Autism Home-Based Therapeutic Intervention” by Mihaela chistol , Cristina turcu , and Mirela danubianu in 2023 , provide a platform for children who were suffering from Autism Spectrum Disorder(ASD) which is to provide home-based intervention.

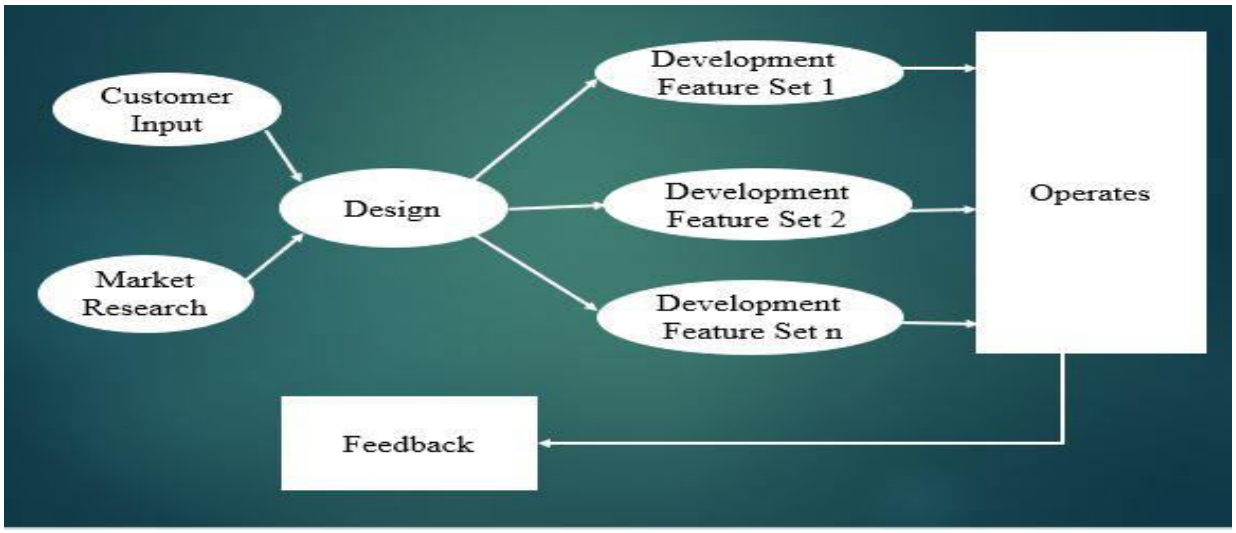
The aim of this research is to investigate the most effective theoretical principles of ABA therapy to create a platform tailored for home-based therapeutic intervention in the context of ASD. The research question driving this study is: ‘‘How can educational software be designed to provide home-based therapeutic interventions for children under 8 diagnosed with ASD?’’. To accomplish this goal, the researchers utilized cutting-edge technologies to design and implement a set of intelligent modules for the platform named ‘‘Autism Assistant’’. The primary objective of this platform is to promote greater self-reliance and independence among children with ASD

System Design

The UI is designed with simplicity, clarity, and visual consistency to accommodate individuals with autism who may have sensory sensitivities or difficulties with processing complex information.

The UI starts with home page and the next part of the UI is login page using which the user can login by providing their credentials and if they are not registered then they sign up by filling the required credentials for access the application.

The next phase of the UI is game panel and it consists of three stages likely smart,brilliant, intelligent. Each stage consists of the games according to the complexity levels related to the stages. For example in smart the games are of easy level, in brilliant stage the games of medium stage, and in the intelligent stage the games are of harder level. The users are advance to the next stage upon clearing the previous stages. If they clear the smart stage they are allowed to brilliant stage. If they clear the brilliant stage they are allowed to the intelligent stage and vice-versa.

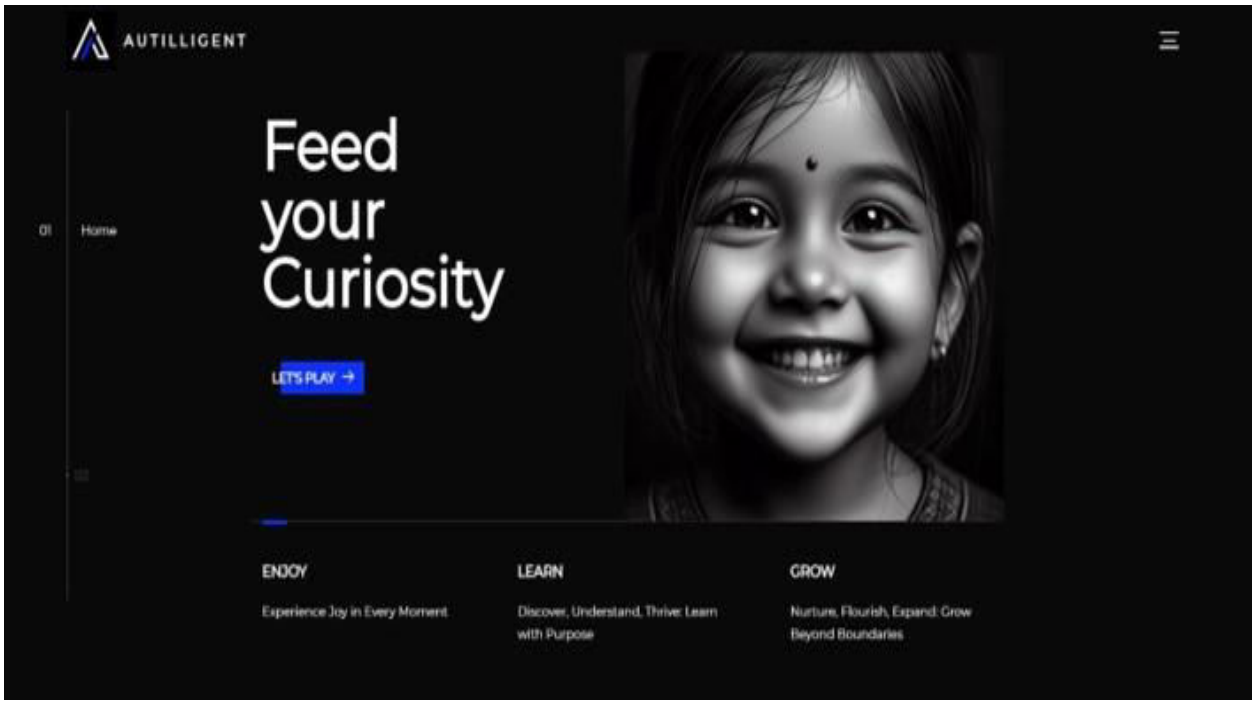


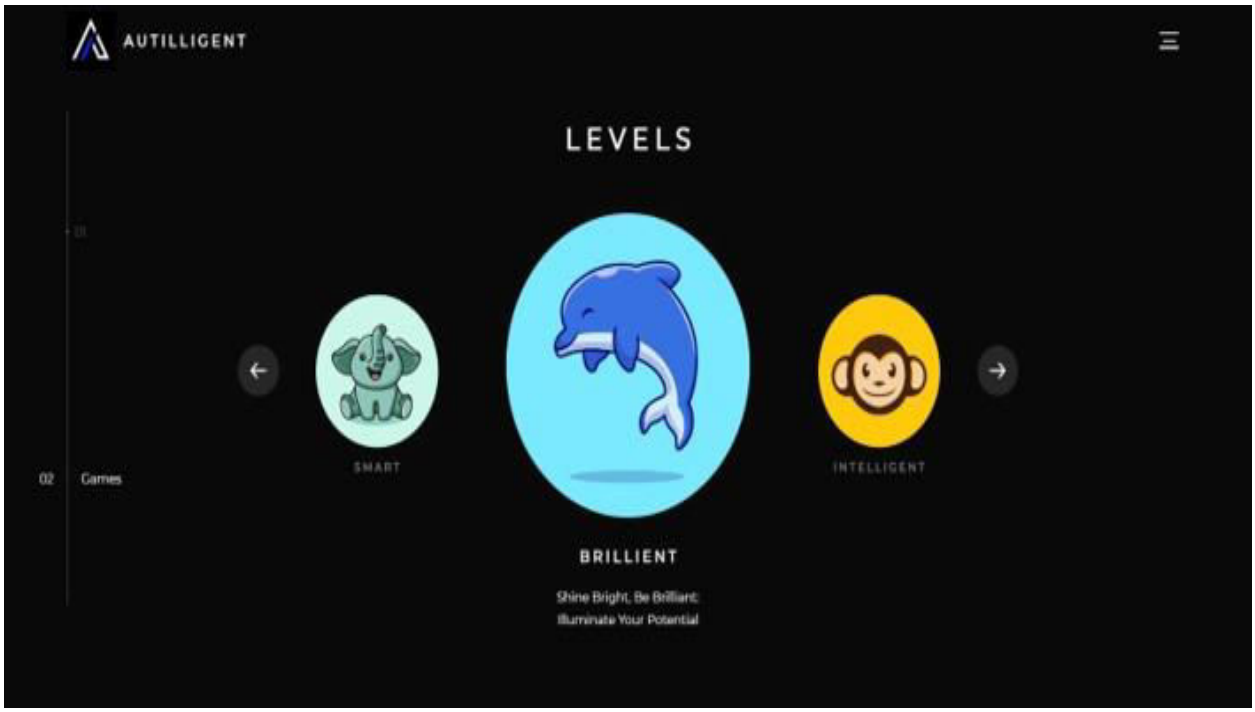
The above mentioned diagram is the architectural diagram of the application. In the above diagram the customer input the starting phase of the application, it is mainly carried out by the user interface. The market research is the research and analysis phase in which the information related to the autism are collected .

Based upon the information collected in the market research phase and customer desire the system is designed. The design includes the user interface which is developed based on the information gathered from the user and the game modules.

The development feature set includes the games being developed for the application and other features like facial expression detection ,different API's for communications, etc. The final phase of this application is the gathering user feedbacks. It is done by providing feedback forms, feedback through emails, gathering feedback by conducting meetings, and feedback through star ratings. Based upon the feedback gathered from the user , any modifications or any feature need to be developed or any new features need to be added or any issues in using the applications are addressed and the implemented .

Snapshots


AUTILLIGENT
01 Home
Feed your Curiosity
LET'S PLAY →
ENJOY
Experience Joy in Every Moment
LEARN
Discover, Understand, Thrive: Learn with Purpose
GROW
Nurture, Flourish, Expand: Grow Beyond Boundaries


AUTILLIGENT
LEVELS
02 Games
SMART
INTELLIGENT
BRILLIENT
Shine Bright, Be Brilliant: Illuminate Your Potential

Conclusion

The project "Autilligent" represents a comprehensive solution designed to support therapy and education for children with Autism Spectrum Disorder (ASD)

The Proposed System aims to empower children with ASD, their families, and caregivers by providing accessible, effective, and inclusive support in their journey towards learning and development.

Future enhancements

In future enhancements more concept based games are going to be introduced and we are going to introduce face expression monitoring to monitor the facial expressions of the user while using the application and automatic interactive game support. As a part of future enhancement the application will be fully converted to an artificial intelligence driven application.

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