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#### **Sri Sivasubramaniya Nadar College of Engineering**

**Team Name: HyperHeroes**

**Project Name: HyperLearn**

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**Problem Statement:**

The problem addressed in this project is the lack of effective educational resources for young children with learning disabilities (LD) and attention-deficit hyperactivity disorder (ADHD). LDs and ADHD occur in approximately 5-10% of children; these young children find activities that students their age should be able to complete easily, extremely difficult. This impedes their academic and personal development. This application aims to engage such children in activities that they enjoy while also enhancing their skills in reading and writing language, and numbers.

**Identification and Explanation of Problem Statement :**

Learning disabilities refer to academic skill deficiencies in areas of reading, maths, and/or writing. ADHD is another high-incidence disorder occurring in approximately 5% of the population. The defining criteria for ADHD diagnosis involve the presence and severity of a significant number of symptoms, either in the area of inattention (e.g., easily distracted) or hyperactivity and impulsivity (e.g., often interrupts or intrudes).

The proposed solution is to develop a gamified educational platform that provides visual and auditory stimuli to enhance learning and motivation. This platform aims to help children with learning disabilities improve their understanding of language, numbers, and direction, through a reward system that keeps them engaged and motivated.

**Description of a creative solution to the issue identified.**

The proposed solution's uniqueness and preference over other similar models on the market, lies in its incorporation of personalised adaptive learning techniques, multi-sensory stimulation, positive reinforcement and accessibility design, to create an engaging and inclusive learning experience for special needs children and children with learning disabilities and ADHD.

Personalization: Children with special needs have different learning styles and abilities. By incorporating adaptive learning techniques, the app can assess a child's strengths and weaknesses and adjust the difficulty level of the content accordingly.

Multi-sensory Stimulation: The proposed solution can engage children with learning disabilities and ADHD by using a multi-sensory approach with visual, auditory, and tactile stimuli to help them process information in a more interactive and engaging way, unlike traditional classroom settings.

Positive Reinforcement: the proposed solution incorporates positive reinforcement by rewarding children with points, badges, or other incentives for completing tasks and making progress. This can help to motivate children to continue learning and make the learning experience more enjoyable.

Accessibility: It should have text-to-speech, closed captions, and adjustable font sizes, among other features, to cater to different disabilities and ensure everyone can benefit from the app.

**Concept behind proposed solution:**

Special Education (SPED) is an Educational Service provided by private or public schools that cater to students with disabilities such as autism, visual impairment, hearing impairment, attention deficit hyperactivity disorder (ADHD), physical disabilities, down syndrome among others. This project is focused on providing a supplementary tool for children with learning disabilities and ADHD.

Mobile/web applications are constantly increasing and people are trying to find solutions to problems in their daily life in the digital world. Addressing learning difficulties through mobile / web applications and gamified learning would be very effective, as it provides an inclusive and effective learning experience for special needs children.

The proposed solution aims to provide an engaging and interactive multiple sense stimulating learning experience that adapts to the child's individual needs and learning style, while fostering feelings of self esteem through rewards and incentives reinforcing good behaviour.

In addition to providing an effective learning experience for special needs children, the proposed solution also aims to address some of the challenges faced by traditional Special Education programs. These challenges may include limited resources, lack of individualised attention, and difficulty in keeping up with the changing needs of students.

**Description of the techniques and technology used in creative solutions to reach a specific goal.**

This application is to be developed as a web application. Following are the reasons -

* Accessibility: Web-apps can be used on any computer, laptop, tablet, or smartphone with an internet connection, making it simpler for kids to access the educational content from any place.
* Cost-effectiveness: Given that it doesn't call for specialised software development kits or programming languages, creating a web app can be less costly than creating a mobile application.
* Cross-platform compatibility: Web-apps can be made to run on various platforms, including Windows, Mac, iOS, and Android, giving them more freedom and device compatibility.
* Simple updates: Web applications can be updated swiftly and easily without requiring users to download new versions or run updates, ensuring that kids always have access to the newest features and content.
* User experience: Web-apps can offer a more consistent user experience across different devices, since they are designed to work on multiple platforms and screen sizes.
* Parental controls: Web-apps can be designed with parental controls and monitoring features to ensure that children are using the platform safely and appropriately.

**Project's purpose and goals:**

Mobile/web applications are constantly increasing and people are trying to find solutions to problems in their daily life in the digital world. The purpose of the proposed project is to address learning difficulties through mobile / web applications and gamified learning which would be very effective, as it provides an inclusive and effective learning experience for special needs children and those with learning disabilities and ADHD. E-learning applications can be used as therapeutic tools to improve both executive functions and quality of life.

The goals/objectives of the proposed project are listed below.

* Providing an engaging and interactive learning experience that adapts to the child's individual needs and learning style.
* Incorporating multi-sensory approach to learning, using visual, auditory, and tactile stimuli to enhance the learning experience.
* Fostering feelings of self esteem through rewards and incentives, encouraging children to continue learning and reinforcing good behaviour.
* Helping children reach their full potential and succeed in their academic and personal lives.

**Feasibility of Solution:**

The web-application described above is feasible for several reasons:

Advancements in web technologies: With the rapid advancements in web technologies, it has become increasingly feasible to develop web applications that are interactive, engaging, and responsive. This makes it possible to develop a gamified educational platform that can engage young children with special needs through interactive games with auditory and visual stimuli.

Market potential: The fact that there is very minimal market competition and very few commercially available solutions for this problem indicates that there is a significant market potential for this type of web-application. This makes it feasible for developers to invest resources and time into building such a platform.

User motivation: The reward system of the platform, which keeps children enthusiastic and motivated to continue learning, is a key factor in the feasibility of the application. This will help to keep the children engaged with the platform and motivate them to continue using it to learn numbers and language.

Educational benefits: There is a strong educational benefit to this type of platform, as it will help children with special needs to learn important skills in a fun and engaging way. This makes it feasible to develop such a platform because it can have a positive impact on the lives of its users.

Overall, the combination of advancements in web technologies, market potential, user motivation, and educational benefits makes it feasible to develop a gamified educational platform for young children with special needs who need to learn numbers and language.

**Advantages & Disadvantages:**

Advantages of the proposed solution:

* The app adapts to the child's individual needs and learning style, providing a more effective learning experience.
* Using visual, auditory, and tactile stimuli engages different senses, enhancing the learning experience.
* Fosters feelings of self esteem in the child through rewards and incentives that provide motivation to continue learning and reinforce good behaviour.
* Features such as text-to-speech, closed captions, and adjustable font sizes cater to a range of disabilities, making the app accessible to everyone.

Disadvantages of the proposed solution:

* Dependence on technology: The app may require a device with an internet connection to function, which may not be available to all users.
* Screen time: Extended use of screens can be harmful to a child's health and development, so the app should be used in moderation.
* Limited physical activity: The app is focused on digital learning and may not provide opportunities for physical activity or movement, which are important for a child's development.