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A Conceptual Approach in Designing Interactive Multimedia Application for Children With ASD

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Abstract: The purpose of this article is to create a suitable treatment program for autistic children that is based on the use of many media formats. This research utilizes a review of the relevant literature, an examination of the issue in the field, interviews, and surveys in order to obtain the data that is needed for the study. A concept to slightly practical approach has been taken to develop the app in a way that makes it possible for them to fit the strategies and lesson plans that are used throughout the treatment process for people who have autism. This has been carried out in a way that has been carried out in a way that makes it possible for them to fit these strategies and lesson plans. Children who have autism may benefit from interactive treatment programs that can be developed with the help of the Lovaas approach. These programs can make use of modern computer technology in addition to different forms of multimedia. These programs would be tailored to meet the needs of autistic children and adolescents.

Keywords: Concept, Interactive Multimedia, ASD.

1 Introduction

Children diagnosed with autism who also have mental retardation will, for the rest of their lives, need constant monitoring and support in order to do their everyday tasks. The elimination of behaviours that are harmful, both to the child and to others, is often the primary focus of treatment techniques for children in this category. Encourage the development of self-help skills (such as cleaning up after urinating or defecating or learning how to use the bathroom, bathing/care, body/dressing, eating and drinking alone), compliance with simple rules or requests, the emergence of simple emotional and social behaviours, communicating / expressing his needs, and play [1].

When children are older, the therapy focuses on teaching them skills relevant to domestic life (home duties) or simple jobs in order to get them ready for living on their own under adult supervision. When communicating with the parents of these autistic children with low functioning, we must be careful not to encourage excessive pessimism or excessive expectations that the child will progress quickly. On the other hand, we must also be careful not to encourage excessive expectations that the child will not progress at all [2]. The most essential thing is to celebrate the development of each kid, regardless of how slowly it occurs, and to take pleasure in spending time with the particular child in question.

Children who have autism have access to a wide variety of options for their therapy [3,4]. The treatment that is administered to one individual with autism may vary from that which is administered to another individual with autism. Because of this, there is a need for more in-depth observations. But the fact of the matter is that individuals still have a relatively poor level of information about how to identify and monitor autism [5, 6, 7]. The 'Lovaas method of treatment,' which is a therapy derived from the 'Applied Behaviour Application' (ABA) therapy, is one approach that is often used since it has been shown to be beneficial. This is one of the reasons why this method is employed. One-on-one therapy, often known as "handling one therapist and one patient at a time," is the core of the Lovaas technique. This indicates that the procedure only involves one patient and one therapist. Tools or media for autism treatment are currently being supplied on the market, and they come equipped with a variety of therapeutic approaches [8, 9]. However, the price is often out of most people's pricing ranges to begin with. It is still rather uncommon for manufacturers or software developers to create autism treatment application devices, particularly interactive multimedia therapy. This situation has persisted up to the present day.

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Due to a lack of suitable equipment, facilities, and infrastructure that is connected with the factors described above, these things have to be imported from other countries at exorbitant and difficult to reach costs, which is obviously not a viable option. In order to do this, we want a tool that is able to include both visual and aural components that are capable of interacting with one another to assist in the communication training of autistic children.

Fage et al [10] educating children who have autism using multimedia technology allows for the visual and auditory components to be packaged and integrated in an interactive manner. This is both a solution and a solution. Given all of this, the role of multimedia in everyday life is quite significant. In addition, the Lovaas technique incorporates the use of multimedia components or components when applying its therapy to interventions for the management of autistic children. As a result, the researcher suggests the use of the Lovaas approach as part of a therapy application for autistic children that is based on interactive multimedia [11, 12, 13, 14].

The number of individuals who are diagnosed with autism seems to be rising at an alarming rate each year, despite the fact that there is a dearth of accurate information on the condition, as well as its underlying causes and potential treatments. In addition, there is a dearth of instruments that may be used in multimedia treatment [15, 16]. This includes a shortage of assistance instruction for children with autism, which can be purchased without incurring large expenditures and also features simple operation. In order for them to be applicable not just by therapists who work with autistic patients, but also by the parents or companions of autistic patients [17, 18, 19].

Therefore, it is vital to propose a multimedia-based program providing treatment for children with autism. This tool must be user friendly and affordable so that it may be utilized and widely used in various communities.

2 Methods

Before beginning this investigation, the researcher took the time to make observations in order to gather data, information, and materials, if any of those were necessary. There are a total of three different approaches to gathering information, and they include a review of the relevant literature, an investigation of the topic in the field, interviews, and surveys.

The researcher obtains data by employing this observation approach, which involves collecting observations as well as being personally engaged in field activities relating to the case study that is currently being investigated. This is accomplished by asking questions to knowledgeable resource individuals in direct conversation in order to collect data and information that is comprehensive as well as accountable. In addition, the researcher gathered photographs and documents that the researcher got from the research site, as well as personal image collections and searches from the internet that were eligible for inclusion in this study. These were all done in order to complete the collection.

Researchers conducted interviews with shadow teachers or therapists who follow children with autism to treatment sessions in order to have a better understanding of the different therapeutic approaches used for children with autism. We conducted interviews to find out how to develop interactive multimedia therapy application materials for autistic children using the Lovaas method that can attract children's attention when using the Lovaas method. We asked for input and suggestions related to the preparation of therapy materials for autistic children in accordance with the rules and curriculum in the Lovaas method. In addition, we wanted to find out how to prepare therapy materials for autistic children in accordance with the rules and curriculum in the Lovaas method. Using this Lovaas technique, an interactive multimedia therapeutic gadget was created. The interviews were done in a way that was not structured.

Researchers gave questionnaires to twenty (twenty) respondents (parents of children with autism and therapists or shadow teachers) who functioned as companions in order to determine how successful the application that the researchers built was. In addition, the purpose of this study is to determine whether or not the interactive multimedia therapy application device for autistic children with the Lovaas method that the researcher developed has an appealing appearance in addition to being useful as a therapeutic tool that assists in reducing the severity of autism in a child. This will be accomplished by asking the question "Does the device have an attractive appearance?"

2.1. Method for App Development

Researchers used a methodology known as "multimedia development" in order to create multimedia applications. This methodology was carried out in accordance with the following six stages: idea, design, material collection, assembly, testing, distribution, and implementation. In contrast, we are just going to discuss three steps throughout this investigation, and those are the following: assembly, testing, and distribution.

3 Results and Discussion

3.1. Assembly

The manufacture of this system makes use of the program Adobe Director 11.5 to design the development of interactive multimedia treatment apps for use with the Loaves approach with children who have autism. There are animation components that were generated by the researchers using the software programs Adobe Flash CS3 and Adobe Director 11.5. The researchers used Adobe Photoshop CS3 for the creation of the photos as well as their editing. During this time, researchers used Cool Edit Pro 2.0 in order to handle sound files (audio).

Following the completion of all of the requirements for the creation of multimedia applications, the following step is the development of this program to the production stage using the software that has been produced. The use of Adobe Photoshop CS3 is required for the first step in the process of developing this application, which is designing the backdrop layout of each page. Additionally, Adobe Photoshop CS3 was used in the beginning stages of the design process in order to create the button layouts and animations.

The next step, which will contribute to the overall attractiveness of this application, is to develop the animated pictures that are required. At this point, buttons that would later be crafted using an animation style are also brought into existence. Adobe Flash CS3 and Adobe Director 11.5 are the versions of software that are put to use.

The processing of audio files is the following phase, which occurs after passing through the steps of designing the backdrop for each application page, as well as animations and buttons. The software programs Sound Forge and Cool Edit Pro 2.0 were used in the processing and editing of these audio files. After that, the video files that are already accessible are modified according to the requirements that have been laid down. Using the Windows Movie Maker program to do editing on video files.

Following the availability and importation of all application components into Adobe Director 11.5, the subsequent step is to arrange these pieces into distinct application pages. At this point, the researcher will create a link that connects one page to another, add sound effects, and compile it all together into a single interactive multimedia therapy application file. This file will incorporate several different therapies and simulations that are necessary for the treatment of autism.

3.2. Testing

This testing of the system was performed three times in total. The Development of Interactive Multimedia Therapy for Autistic Children Using the Lovaas Method is now able to function normally after having undergone testing for a total of three times. An analysis of the efficacy of the Therapy Application for Autistic Children Based on the Interactive Multimedia-Based Lovaas Method is performed after the user has had a chance to try out the application and after it has been deployed. Following the testing of the program, this evaluation was carried out on twenty (twenty) respondents, all of whom were either therapists, shadow teachers, parents, or companions of autistic children. The purpose of the evaluation was to determine the difference between the situation before and after using this application.

Table 1: Evaluation questionnaire category

No	Category
1	Comparison of the level of concentration and focus of autistic children before and after using the application.
2	Comparison of the ability of autistic children to recognize objects, colors and shapes around before and after using the application.
3	Comparison of the ability of autistic children in interacting with surroundings before and after using the app.
4	Comparison of the ability of autistic children to mingle with other children normally before and after using the application.
5	Comparison of the level of interest of autistic children in using computer before and after using the application.

3.3. Analysis of Questionnaire Results

Comparison of the level of concentration and focus

After utilizing the program, the children with autism will be evaluated in this area to see whether there was an improvement in their ability to concentrate and focus.

Table 2: Questionnaire results category 1

Answer	Number of Respondents	Number of Answerers	Percentage
Concentration and focus of autistic children are getting trained	20	17	85%
Decreased concentration and focus of autistic children	20	2	10%
Nothing changes	20	1	5%

It is clear from the findings of the study conducted for the first category that the application that has been developed has the potential to better train the attention and focus of autistic children than was previously possible.

Comparison of the ability of autistic children to recognize objects, colors and shapes

After utilizing the program, this category will assess whether or if there is an extra treasure for autistic children in terms of recognizing items, colors, and forms.

Table 3: Questionnaire results category 2

Answer	Number of Respondents	Number of Answerers	Percentage
Increase	20	17	85%
Decrease	20	0	0%
Nothing changes	20	3	15%

The findings of the assessment conducted for the second category show that the application that was developed has the potential to expand autistic children's vocabulary when it comes to the recognition of objects, shapes, and colors in comparison to the results obtained in the first category.

Comparison of the ability of autistic children in interacting

After utilizing the program, this criterion will evaluate whether or not autistic children have shown an improvement in their capacity to engage with the world around them.

Table 4: Questionnaire results category 3

Answer	Number of Respondents	Number of Answerers	Percentage
Increase	20	16	800%
Decrease	20	1	5%
Nothing changes	20	3	15%

According to the findings of the study conducted for the third category, the apps that have been developed have the potential to enhance the capacity of autistic children to engage with the environment in which they find themselves in comparison to what it was before.

Comparison of the ability of autistic children to mingle

After utilizing the program, this aspect will be evaluated to see whether or not autistic children show an improvement in their ability to socialize properly with children of a similar age.

Table 5: Questionnaire results category 4

Answer	Number of Respondents	Number of Answerers	Percentage
Increase	20	12	60%
Decrease	20	2	10%
Nothing changes	20	6	30%

The findings of the assessment conducted for the fourth category reveal that the apps that have been developed have the potential to enhance autistic children's capacity to interact socially with other children when compared to the situation that existed in the past.

Comparison of the level of interest of autistic children in using computer

The purpose of this category is to determine whether or not this application can pique the interest of autistic youngsters in the use of computers.

Table 6: Questionnaire results category 5

Answer	Number of Respondents	Number of Answerers	Percentage
Increase	20	13	65%
Decrease	20	3	15%
Nothing changes	20	4	20%

4 Distribution

Cleverland is the name of the program that implements the interactive multimedia-based Lovaas technique as a kind of treatment for autistic children. The Cleverland program may be run using either the automated approach or the manual method. These are the two possible modes of operation. Because there is no need for a prior installation procedure, learning how to operate automatically is a very simple process. When it comes to the manual operation, it is also quite useful. To learn how to use it, just double-click on the "Cleverland.exe Application" file, and the program will launch and instantly show the Intro Page.

If the user of this application wants to immediately play the simulation games that are included in this Cleverland application, they can bypass the need to open the Cleverland application in the first place by going directly to the game folders and then clicking two times on the name of the game. After that, the game can be played without any further delay. previously. The full page of this program may be utilized, even on machines that do not have the Adobe Director 11.5 software, since this file is in the form of a "projector exe."

People with autism may be taught via treatment to grow normally like other healthy children, even if autism cannot be healed in its entirety. This allows the autistic person to develop in the same way as other healthy children. In this particular scenario, treatment on its own will not be effective since the participation of parents is required in the process of monitoring their child's growth. Parents and behavioural management therapy are thus essential components in the treatment of autism.

Although it has been shown that behavioural therapy, education, and medicine may enhance the learning and behavioural skills of children with autism, and even enable some children with autism to operate close to normally, there is no prescription that can 'cure' this illness. When caring for a kid who has autism, the goal is to help that child reach his or her full potential while also assisting other children and their families in developing healthier coping mechanisms and finding more satisfying ways to live with this disease.

The therapy that is provided is adapted to the symptoms that are shown by those who have autism. Children with autism who have average intelligence, are able to communicate, and do not have repetitive behaviour or injure themselves or others will have a different focus on how they are handled compared to children with autism who have mental retardation, are unable to speak, and have behaviour that injures both themselves and others. This is because children with autism who have mental retardation, are unable to speak, and have behaviour that injures both themselves and others are more difficult to manage.

Picture Exchange Communication (PEC), also known as Computer Pictograph for Communication (COMPIC) or Communication Through Picture, is one of the modes of instruction and treatment that may be provided via multimedia therapy. Via the application of multimedia technology, the photos that were before organized on a hand-operated communication board may now be accessed through a computer [20, 21]. Because multimedia may include audio (music) at the same time, this kind of treatment has the potential to be a very appealing activity for autistic children. This is one of the advantages of using multimedia. The content of multimedia treatment may be altered to suit the client's requirements. There are many different kinds of multimedia treatment for children with autism available on the market today. Some of these therapies include excellent gaming simulations that are designed to excite the nerves in the brain with stimuli in the form of appealing colors and forms. The activities consist of putting together basic random images (jigsaw), mixing and matching colors, shapes, or photos while listening to upbeat music that may get the youngster excited. As you go through the game's stages, the difficulty of its many challenges becomes more difficult. This is thought to be important in order to teach the youngster how to concentrate on one item at a time. The game resembles a cross between shooting and coloring. There is still a straightforward jigsaw puzzle involved, but the autistic youngster will be presented with a challenge in the form of a time constraint in order to finish the arbitrary image.

If therapy for autism is started at a young age, it is feasible for patients to recover. Additionally, Lovaas discovered that the better the results were, the younger the children were when rigorous behavior management was initiated for them. Teaching the Lovaas technique requires a high level of self-control, reliability, and consistency [22, 23]. In a perfect world, the Lovaas technique would be taught to youngsters between the ages of two and five, with at least forty weeks of practice. Negative feedback, in the form of the word "no," a disappointed look, a shake of the head, or any number of other expressions, is the fundamental tenet upon which the Lovaas technique is founded. This feedback may take the form of any one of these or any other expression.

Positive feedback, such as the word "good," presents, applause, hugs and kisses, or other words of appreciation may be offered in exchange for appropriate conduct, such as in this example. The storehouse of incorrect conduct will, in the end, be replaced by the treasury of acceptable behaviour. Children may have their parents or therapists serve as their teachers for the behavioural management component of the Lovaas technique. The youngster will get a reward if he or she is able

to quickly follow out the instructions. In such case, the directions need to be restated. If the youngster has tried anything up to three times and been unsuccessful each time, the child's parents or therapist need to step in and help right away. For instance, turning his face toward you when you call his name. It is imperative that the youngster see the person doing the calling as it is performed over and over again until the child comprehends what it means to be called.

We need to modify our teaching methods to correspond with the patients' preferred mode of communication so that we can teach them how to communicate. Parents and teachers may communicate with their children who have autism by making facial expressions, using gestures, varying the tone of their voice, pointing to images and text, using communication boards, and using symbols [23, 24]. Not only may any of these approaches be employed alone, but they can also be combined to provide a more convincing argument.

5 Conclusion

The term "therapy applications for autistic children based on interactive multimedia" refers to treatments that incorporate several different types of media into a single application. These applications are designed to accommodate the methods and curriculum that are utilized during the treatment process for individuals who have autism. Using the Lovaas technique, it is feasible to create interactive multimedia treatment programs for use with children who have autism by employing both modern computer technology and modern forms of multimedia. The Lovaas technique employs a multimedia system development method that consists of six (six) phases or stages when it comes to the process of planning and developing interactive multimedia treatment apps for children who have autism utilizing this method. The processes involved in developing an interactive multimedia treatment application for use with children diagnosed with autism using the Lovaas approach are included in this technique. According to the findings of the tests, this application is capable of running smoothly and in accordance with the rules that were established; hence, it may be implemented and used as a tool or alternative therapeutic medium in the management of children who have autism.

Acknowledgments

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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