AN INTELLIGENT SELF-ADAPTABLE APPLICATION TO SUPPORT CHILDREN EDUCATION AND LEARNING

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ABSTRACT

This Children are future of a society within a country. They should be provided with all round educational development since educating children has many advantages. If they are educated, they can face any problem and this makes them strong and happy. In other words the growth of a country is dependent on its learned population. Children with special education needs have problems to develop cognitive abilities like thinking, learning and obtain new knowledge and concept. It may also be required to improve their conduct, communication skills and interactions with their environment. It is required to develop customizable and compliant applications designed to support them in adapting with respect to the current situations they face and thus take actions appropriately. Such applications would provide them the assistance to allow them frame their learning essentials and help to process to the diverse sensory and cognitive impairments including the mobility issues. This research will be based on artificial intelligence concept and will be self-adaptable. Besides, in many cases they have the opportunity to perform activities that previously were not accessible to them, because of the interface and contents of the activities have been adapted specifically to them. The study also suggests that the repertoire of types of activities provided is suitable for learning purposes with students with impairments. Finally, the use of electronic devices and multimedia contents increases their interest in learning and attention.

KEYWORDS

Children literature, Integrated environment, Reading skills, Learning skills.

1. INTRODUCTION

With the enormous popularity, enhanced power, increased availability of computing devices and remarkable development hypermedia, the young children are growing huge fascination towards the use of computer devices. Therefore It is obligatory to comprehend the impact of technical gadgets among children. These could have positive as well as negative affect on the lives of the children depending on their age group. The consequences of negative impact as most people believe are that the use of technology in the form of i-pads or laptops enabled with internet connectivity with multimedia entertainment, online games or activities, social interaction may lower the opportunities for physical development and team attitude among children. But on the other hand the technological advances have created a hybrid of interactive educational applications into the homes of children –such a revolutionary achievement. The digital world can provide a variety of phonological awareness activities and can assist to deliver feedback to students and present reports to teachers about progress of their students . The proliferation of interaction devices based on Multimedia resources have given rise to a wide range of learning strategies based on platforms integrated with sound, text , animated images, video media . These

platforms use different modes of input such as typing, speaking, pointing devices. These platforms could be used to create various interactive applications for children involving activities such as matching images based on sound or even guess the beginning alphabet, identify a sequence of sounds based when the words merged together, rhyming words, etc. These activities supported by the computer interaction could be extended to create advance activities that will enable the children to participate to contribute their literature and ideas for literary purpose. Not only this the young minds can generate their views on the teaching learning processes from the children's' perspective to make the process more effective. The students could make contributions towards the literature corresponding to their capabilities either by writing stories, poems, posters, share their views on a topic with other students, participate in competitions involving literature and improve further by continuous development in this area.

The act of preserving of children's literature would be a source of great inspiration for children and it will make the world understand the children requirements and expectation from their viewpoint.

1.1. Objectives of the Proposed Research

1. To provide a multipurpose interactive learning environment to normal as well as impaired children.

2. To study the problems and difficulties faced by the children to read and learn.

3. To analyze their interests in different educational activities and guide them with the appropriate levels and environments of learning.

4. To create an integrated environment capable of following actions:

a. That will have educational activities through which they can explore, solve the puzzles in different fields of their interest to enhance their cognitive aspects.

b. The application will be developed to help the children to understand and improve following features:

1) basic skills of language
2) acquire mathematical skills
3) Moral and ethical awareness
4) develop environmental awareness
5) self-sufficiency (independent decision making) and
6) social behavior.

5. Provide the children the access to all the available and relevant applications on a secure platform since the digital technology is so ubiquitous that it needs protection.

6. Finally, identify and analyze the impact of use of interactive over traditional methods to benchmark results of comparison during their academic progress to determine the change of behavior among children. This paper discusses the different issues and problems faced in order to develop the integrated environment that will help the children to read and learn so as to make these tasks easy and convenient.

2. PROPOSED SYSTEM AND IMPLEMENTATION DETAILS

The established body of research and literature on the effects of television viewing and screen time on young children, while foundational, does not adequately inform educators and parents about the effects of multiple digital devices, each with its own screen. As multi touch technologies and other emerging user interface possibilities become more affordable and available, new research is needed on what young children are able to do and how these tools and media can be integrated in a classroom. Research-based evidence about what constitutes quality technology and interactive media for young children is needed to guide policy and inform practice and to ensure that technology and media tools are used in effective, engaging, and appropriate ways in early childhood programs. The research targets the creation of supporting tools and technologies for improvement and enhancement of Children education.

The technology nowadays can be used as an assessment tool to measure the educational potential of children of different age groups. The current knowledge about children's cognitive and social abilities can be useful for the development of computer based applications. The following section provides the insight of the target tasks for children software development and accomplishment details. There are THREE phases of the software platform/tool (Fig.1) for enhancing education skills in children namely database creation, improving reading skills of children and platform development for enhancing learning skills in children.
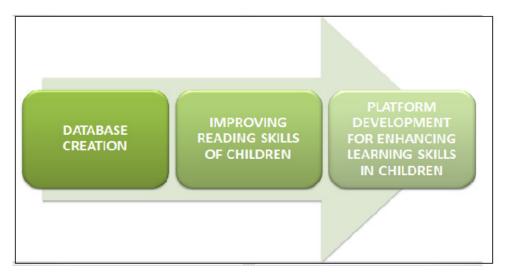

Figure 1. Integrated Environment Model for Enhancing Children Education

2.1. Database Creation

Steps for Creating the database for storing children data and resources

1. The aim of the research is to create an integrated platform(Fig.2) for young minds to enable them to participate in various competitions to learn new concepts, exchange their ideas, make literary contributions in various forms.

2. All the information related to children interaction and their cognition aspects, their ideas, views, comments, their writing skills, story creation and illustration, science and mathematics

3. projects developed by children, arts and drawings created by children could be permanently stored and preserved in the database.

4. The generated database could be searched in future to perform a prospective study on the use of technological tools by the young children and their development.
5. The database created would certainly become a source of inspiration to many children in future and also revolutionize the coming generations with respect to the existing child literary work. The prospective study could be analyzed and visualized to measure the ease and level of understanding of concepts among children.

6. The integrated platform will be encourage and motivate the children to use computer assisted instructions, multimedia materials and improve their learning skills.
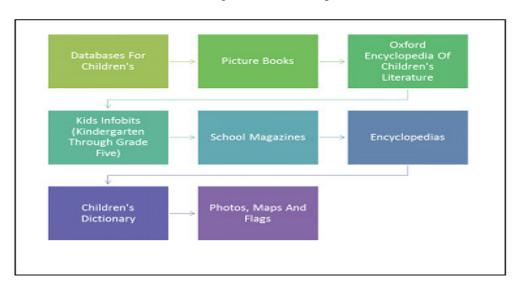

Figure 2. Database Model for Preservation of Children Resources

2.2. Suggested Requirements and Support to Enhance the Reading Skills of Children to be incorporated in the Integrated Platform

This section covers the details support to enhance reading skills. Contemporary research in teaching emphasizes the role of classroom materials as necessary resources to give a child the opportunity to cultivate the reading and understanding strategies [10]. Lot of research has been based on the learner-oriented concept that fosters children's cognition, reading and writing while learning. The integrated platform provides the development of such materials that could influence the progress of cognitive skills such as evaluation, identification, organization, interpretation, blending, analysis and the use of contradictory thinking to cultivate reading skills within the child. Some of the key concepts are mentioned below:

1. This section represents the second step of the application and intends to present the child/student with a set of key concepts as clues so that they can build up the word in their mind and speak it aloud. It will be implemented by a questionnaire method.

2. The third step uses a mind map by offering the child a set of images to map to the given text. The method is based on the imagination, recognition and cognition capabilities to be utilized by the children.

3. The fourth step uses the recalling aspect where the whole text can be recreated in the form of a story and the child can make prediction and exhibit the reading skills .

4. The fifth step the child is trained to identify the important elements that were found when reading the text. For instance main characters, contents, headings, photos, index, etc.

5. The sixth step is advanced, the app plays the role of a Reader to monitor the comprehension. The methods for monitoring are specified by the application and the child has to follow the instructions as provided by the application. The monitoring strategies normally are known as CLICK and CLUNK. The strategies like Re-read, Read-on, read-out-loud, identification of confusing words, etc. can be used to repair the CLUNKS.
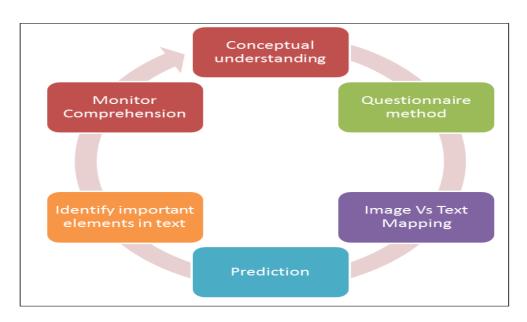

Figure 3. Integrated Environment/ Platform for improving Reading Skills in Children

2.3. Platform Development For Enhancing Learning Skills In Children

With the constant progress in direct instruction approaches, as well as the design processes that support them, have been criticized for failing to reflect contemporary research and theory in teaching, learning, and technology[3]. Learning systems are needed that encourage divergent reasoning, problem solving, and critical thinking. Student-centered learning environments are required to support such processes. With the advent of technology, many barriers to implementing innovative alternatives may be overcome. The purposes of this research is to review and critically analyze research and theory related to technology-enhanced student-centered learning environments and to identify their foundations and create a platform where the students can use various tools of technology to learn concepts. The recent review [4] in the literature from neuroscience, education, psychology, cognitive science, and linguistics - and used converging evidence to propose four pillars of learning to evaluate the educational potential of

apps for children over the age of 2 years. The key question is what are the features to be included in the computer applications that might increase or decrease the children educational potential? Recent research has yielded the following criteria: The software platform(Fig. 4) incorporates the stepwise approach for supporting learning in children given below:

1. Active Vs Passive Learning

The Active learning concepts are more applicable to Tablets since these encourage more active commitment than other forms of media (television/ traditional books). However. Learning does not occur through the finger. it occurs through active comprehension and mental manipulation whether or not the child taps or swipes. Learning occurs when the learner has to mentally manipulate ideas, see similarities and differences between new concepts and existing knowledge, and incorporate this new information into a more comprehensive understanding. This is true in many contexts for varied learners[8][9]. The software application will use the importance of the minds-on attitude of the learning activity for the evaluation of the educational potential. Therefore activities based on identification, recognition, etc. will be utilized by the tool to generate an intelligent scenario so that the child can solve it through which he gains the required knowledge.

2. Learner Concentration Vs Distraction

Learner Concentration or engagement is important to understand the involvement of the children and it is based on inherent interest of the children. It is an accepted fact that the recent technology has transformed the creation of educational content for children. Children can watch an animal or a bird in their actual habitat instead of hearing or talking or reading about it or seeing a static picture. Due to the new developments in technology children can interact more frequently and effectively with letters and words by working with letters on the screen, hear and understand how sounds work. These technological enhancements can distract young children from learning and also misguide the developers from achieving their target educational goal. It is observed that young children are particularly susceptible to this distraction and a recent study[10] investigating parent-child interaction with electronic books versus their traditional counterparts, therefore multimedia enhancements may possibly benefit or harm.

3. Learning occurs if content is meaningful

Children can begin to learn anything may be the names of animals to the characteristics of mammals but this learning should occur in suitable contexts that connects children's lives[10]. When selecting or creating apps, it is crucial that children do not just learn that the triangle on the screen is a triangle but that the piece of pizza in front of them resembles a triangle, too. Therefore meaningful learning has greater educational potential than and implicates learners of all ages. By engaging deeper levels of processing, greater learning occurs. To develop this mode of children learning the application is creates lessons compatible The tool may have lessons so that the learners can use them and generate their own answers and answer the questions provided. This stage will improve the memory and intellectual skills of children.

4. Use of social interaction to maximize learning

One of the attractive features of hypermedia is the use of tablets by children, from a very early age are capable of using devices independently. It is evident from recent research that it repeatedly accesses social interaction supports learning[7]. In this stage we allow the children to communicate and share information and knowledge on the social media where they may receive responses from the common public as well as their friends and relatives. The application supports

a provision development to connect to the social networking sites. The children can participate even with their parents and others. The application may use strategies which require on-screen and off-screen solving of the problems. This will improve the problem solving, decision making and writing aspects of children.

5. Guided assessment towards a learning goal

To maximize the educational potential, the children are presented with a context of guided exploration toward a learning where context for learning with extremes ranging from direct instruction[2][5] in which the adult is involved with children and the children are given independence to explore the world. The application creates a guided play and the child has an active role but a knowledgeable partner supports the child's learning[6] . These guided plays are very beneficial in some area such as language and space and assist children create a well prepared, flexible and dynamic mindset that promotes meaningful and socially collaborative learning. It is wise as well as crucial to evaluate or design educational applications, and ask whether the content appears educational to examine how the application supports active learning w.r.t children education.
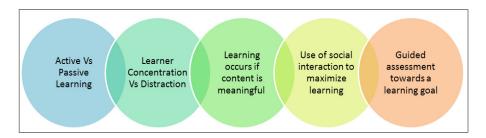

Figure 4. Integrated Environment/ Platform for Learning Skills in Children

3. CONCLUSIONS

Digital children's literature is supported by digital resources like pictures, audio and video, text and images, spoken words and illustrations, , graphics design, illustrations and annotations, scenarios, interactive storyboards, hyperlinks and socially active networks that are useful to produce layered or hierarchical understanding among children. It is obligatory on a teacher to be abridged with the fast growing collections and applications related to digital children's literature. Although Nonetheless the educators were interested in using technology for providing assistance to readers but it had less focus on its usage, however it is possible to allow children to use digital children's literature. As of today e-learning has become common and hence literacy instruction sing technology for increasing reading performance widely accepted for developing reading skills among children that involve appropriate reading activities. The learning skills can enhance the overall development of fluency, writing and comprehension skills.

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REFERENCES

[1] Hannafin, M.J. (1992). Emerging technologies, ISD, and learning environments: Critical perspectives. Educational Technology Research and Development 40(1): 49–63.

[2] Gagné, R. (1985). The Conditions of Learning (4th ed.). New York: Holt, Rinehart, & Winston.

[3] Ambron, S., & Hooper, K. (Eds.). (1990). Learning with interactive multimedia: Developing and using multimedia tools in education. Redmond, WA: Microsoft Press.

[4] Hooper, S., & Hannafin, M.J. (1991). Psychological perspectives on emerging instructional technologies: A critical analysis. Educational Psychologist, 26, 69-95.

[5] Selwyn, N. (2012). Sharpening the "ed-tech imagination": Improving academic research in education and technology. Keynote presentation to the Critical Perspectives on Learning with New Media Conference, Monash University, Australia (pp. 6–16).

[6] Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? Contemporary Issues in Technology and Teacher Education (CITE Journal), 9(1), 60–70.

[7] Selwyn, N. (2010). Looking beyond learning: Notes towards the critical study of educational technology. Journal of Computer Assisted Learning, 26(1), 65–73. doi: 10.1111/j.1365–2729.2009.00338.x.

[8] J. Charlton, I. Danforth, Distinguishing addiction and high engagement in the context of online game playing. Computers in Human Behavior, vol. 23, no. 3, pp. 1531-1548, 2007.

[9] S. Chaudron, Young Children (0–8) and digital technology, Luxembourg:Publications Office, 2015.

[10] Richards, J. (2001). The role and design of instructional materials. Curriculum Development in Language Teaching, 8, 251-283.