

## **Technological Advancement in ODE: An Augmenter for Differently Abled Students**

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### **ABSTRACT**

Open and Distance Education (ODE) has given wide scope to all the types of learners with the objective of democratization of education. Open and Distance education is an approach to learning that gives students flexibility and choice over what, where, when and how they learn.

Distance education is increasingly using combinations of different technologies to improve communication between educators and learners. Technological innovations and advancement using computers, mobile and fast speed internet connectivity is used to reach the unreached by reducing the accessibility gaps encompassing the drop outs and differently abled students.

Differently abled was first proposed in 1980 as an alternative to disabled, handicapped, etc. on the grounds that it gave a more positive message and so avoided discrimination towards people with disabilities.

Distance learning gives a wide scope to the differently abled students with physical impaired, visually impaired, and auditory impaired by opening new horizons to learning. The infrastructure need to be friendly for differently abled students. In view of these, it is recommended that the open and distance learning universities need to pay attention to the admission policy, infrastructure, and train teachers to be responsive to the needs of students with differently abled students.

The research will focus on inclusion of differently abled students through ODE with the use of tools and technology. For conducting this research, survey (quantitative), interview & observation (qualitative) have been used.

**Keywords:** Open and Distance Learning, Technology, Differently abled students

### **INTRODUCTION**

Technology is the collection of techniques, skills, methods and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation. Technology can be the knowledge of techniques, processes, and the like, or it can be embedded in machines which can be operated without detailed knowledge of their workings. Technology can be most broadly defined as the entities, both material and immaterial, created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems.

Tools and machines need not be material, virtual technology, such as computer software and business methods also have become the part of the technology. W. Brian

Arthur defines technology in a similarly broad way as a means to fulfil a human purpose. In this context, it is the current state of humanity's knowledge of how to combine resources to produce desired products, to solve problems, fulfil needs, or satisfies wants, it includes technical methods, skills, processes, techniques, tools and raw materials. Along with the awareness of technology, it is imperative to get the access of technology overcoming any kind of barriers. Technology is properly defined as any application of science to accomplish a function. The science can be leading edge or well established and the function can have high visibility or be significantly more mundane, but it is all technology, and its exploitation is the foundation of all competitive advantage. Technology can be said accessible, when it can be used by individuals with a wide range of abilities and disabilities.

The Foundation for Information Technology Accessibility (FITA) was founded by the Malta Information Technology Agency (MITA) and the National Commission Disabled Persons in the year 2000 with the purpose of promoting the effective use of ICT to promote better quality of life for disabled persons. FITA is the principal advocate and coordinator for making information communications technology accessible for differently abled people, which manages the implementation of IT programmes in Government to enhance public service delivery and provides the infrastructure needed to execute ICT services to Government.

Technology can be accessible either directly or each individual is able to interact with the technology in ways that work best for him or her. The advancement of technology has not only given scope to able students but a new way to grow and develop for differently abled students.

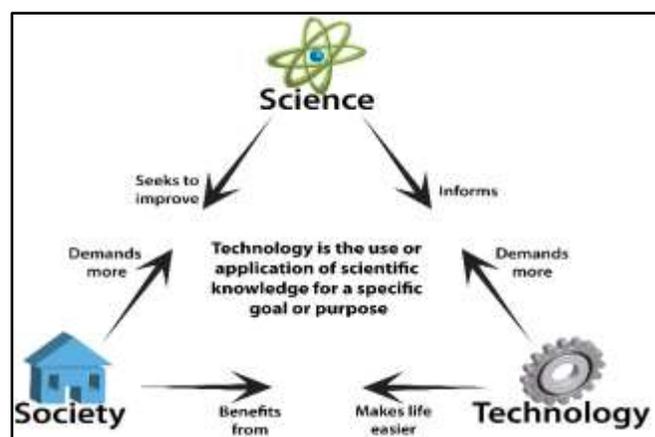


Fig. 1. Technology triangle

Differently abled was first proposed (in the 1980s) as an alternative to disabled, handicapped, etc. on the grounds that it gave a more positive message and so avoided discrimination towards people with disabilities.

Physical barriers and lack of convenience usually prevent person having disability from taking higher education particularly in the countries like India. Lack of confidence in their talent and social discrimination results into lower confidence and self esteem. So they think about themselves like being “surplus citizens” that are enable to make any contribution in the society. It is not difficult to remove this inferiority complex from them if little interest is taken towards guiding them in a few particular types of skills that can evolve their concealed talents and take them to next level. For this purpose open and distance education can play a significant role. The open schooling system is meant to supplement and complement the formal system to provide “education for all”, especially for educational development of disadvantaged groups, particularly the scheduled castes, the scheduled tribes, minorities, other backward castes and differently-abled people.

Distance Learning is one of the most popular and rapidly growing fields of education today. In an era of lifelong learning, Distance Education becomes a natural choice for millions who desire to upgrade their knowledge from time to time to cope with the drastic and revolutionary changes happening in every field of study. Technological advancements have altered beyond recognition the educational scenario during the past few decades. Strongly linked with developments in Information and Communication Technology (ICT), it has the potential to generate new patterns of teaching and learning. These types of innovations in mainstream education may even have effects beyond the realm of education itself.

In this era of globalization, institutional and inter-governmental cooperation is increasing and the concept of ‘global class room’ has been realized. Mass education is accepted as the motto of the democratic governments. In this context, distance education has a crucial role in the global knowledge-based society. Most of the communication between teachers and learners is through an artificial medium, either electronic or print. Technology is the principal means of communication in distance learning while teachers in conventional class rooms use technology as a supplement to their teaching.

Open and Distance Education

Definition:

"The acquisition of knowledge and skills through mediated information and instruction, encompassing all technologies and other forms of learning at a distance".

.....The United States Distance Learning Association

"Any form of learning that involves a physical distance and more importantly absence of face-to-face interaction is known as distance learning."

Open learning, which covers a wide range of innovations and reforms in the educational sector that advocates flexibility to the learner with regard to entry and exit, pace and place of study, method of study, the choice & combination of courses, and assessment & course completion. The lesser the restrictions, the higher the degree of openness. The Open learning system aims to redress social or educational inequality and to offer opportunities not provided by conventional colleges or universities. Educational opportunities are planned deliberately so that access to education is available to larger sections of the society, therefore Open and Distance Learning is a term which accepts the philosophy of "openness" and uses the "distance mode" of learning

In the last six decades the Open and Distance Learning (ODL) system has registered a phenomenal growth in the context of expansion and diversification of higher education. Open and Distance learning is an approach to learning that gives students flexibility and choice over what, where, when and how they learn. Continuing education is an umbrella term which covers a wide range of educational opportunities for able or differently abled students. There have been many attempts to define both open and distance learning. A recent discussion of these terms described them as 'approaches that focus on opening access to education and training provision, freeing learners from the constraints of time and place, and offering flexible learning opportunities to individuals and groups of learners.'

The recent developments in distance education include massive open online courses and open access via the web or other network technologies. Massive Open Online courses include largescale interactive participation and open access via the web or other network technologies. Distributed Learning, e-learning, online learning are the other terms which are used synonymously with distance education. Distance education is the broadest term and has largest collection of research articles. The learner (student), through distance education enjoys a high degree of autonomy in deciding what, how and when to learn.

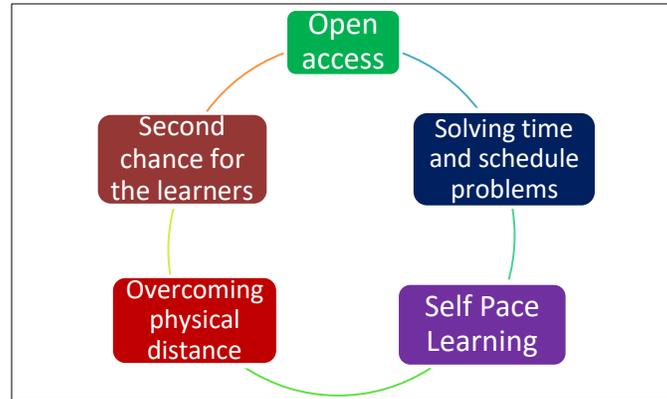
Continuing education is generally restricted to adults who have already completed their degrees. Therefore, such basic educational programs as literacy, vocational, etc. not fall under the context of continuing education. These programs are generally understood to be the completion of one's education, not the continuation of learning throughout the lifetime. Continuing education includes lectures, courses, seminars, webinars etc.

In many countries, a great deal of continuing education occurs in many community colleges. These colleges offer both the courses designed for the completion of a degree, allowing non-traditional students to go to school part-time around their work schedule or even the students who have some disabilities. Additionally open and distance education also caters to various programs designed solely for personal and professional enrichment. The point of continuing education is to be a lifelong learner.

### **NEED AND SIGNIFICANCE**

The concept of Open and distance education is interpreted as education for those who are earning and learning. Whereas open and distance learning has a wide scope, which includes all types of students overcoming the barrier of the age, gender, culture, social economic conditions and ability.

Distance education experience needs to be relevant to the needs of the learners with disabilities. It should widen and create access to learning and training opportunities that are tailored to meet the needs of the individual through use of technology. This kind of platform would allow distance learning to take place for excluded groups as per their requirements. In today's scenario education for all is a need to cope up with the rapid development. The need for this research is to open a new outlook towards the development of differently able students through distance education by providing accessibility to technology. Significance of Open and distance learning is been recognised due to specific characteristics like,



**Fig.2. Characteristics of ODE**

i. Open Access: All students are regardless of their abilities have access to learn with the advent of technology. The access can be available 24 x 7, 365 days.

ii. Solving time and schedule problems: The learner has enough time to complete the course as per his/her ability and convenience.

iii. Self Pace Learning: Learners learn at own pace and take their own decisions about the learning path with the guidance and support of the instructor.

iv. Overcoming physical distance: Differently abled learners can learn from their own place, by overcoming the distance barrier.

v. Second chance for the learners: The differently abled learners get a scope to learn further after schooling due to openness and flexibility. Further their skills can be developed and knowledge can be upgraded.

#### **ADVANTAGES AND BENEFITS OF DISTANCE LEARNING:-**

1. Choice: An online education provides the opportunity to study more subjects and reach out to programs that are not available in the immediate area.

2. Flexible: Distance learning is much more flexible than traditional styles of classroom education. Students who need to take other classes or work can do classwork whenever they have a free moment instead of being restricted to a rigid schedule.

3. Networking: Students who enroll in classes with online education obtain a wider range of networking opportunities. Instead of being limited to networking in the local area, distance learning enables students to make connections with a more diverse range of people.

4. Money: Online classes typically cost less than an education in a classroom environment. There are less space limitations and materials required for each student and the savings are passed on from the educational institution to each student.

5. Traveling: A huge advantage to getting an online education is that there is no need to travel to and from class every single day. Someone who doesn't drive or want to spend money on the costs of public transportation every single day will likely choose to get an online education over the traditional classroom.

6. No classroom sitting: Sitting in the classroom is not the best way for every student to learn. A student may learn better at his own pace and in a different format than traditional schooling options offer.

Technological accessibility has resulted in the emergence of new methods of teaching and learning in the field of distance education. Now, students have access to experts and tremendous volume of online databases. Instead of searching for hours through card catalogues and library stacks, students can utilize online search engines to find countless articles and research databases within seconds. More and more internet users are uploading and sharing audio-visual data on the social networking sites, video-sharing sites, wikis, blogs, etc. Internet is the largest library with large access to information, knowledge, case studies and resources.

ICT tools like e-mail, e-conferencing, e journals, e-books, e-newsletters, online discussion forums, virtual class rooms etc. have enhanced the scope of distance learning and have proved to be more powerful. Technology has the potential to address many challenges in the field of higher education. Distance Learning institutions need to move up technologically by incorporating the latest developments in ICT.

Adoption of latest technological developments in the field of distance education changes the way in which instruction is delivered. This requires new skills for both the instructor and the student. Absorption of innovations shifts the educational experience from 'teacher centered' to 'learner-centered'. Instructors become more facilitators or intermediaries between the students and the resources they need for their own independent study.

#### OBJECTIVES:

- To identify the need of open and distance education for differently abled students.
- To study the role of technology for continuing education of differently abled students through open and distance education.

- To analyze the technological accessibility in open and distance education for teaching differently abled students.
- To develop a model for enabling teaching learning process through use of technological tools.

### **RESEARCH METHODOLOGY:**

Mixed Method Research- Is a methodology for conducting research that involves collecting, analyzing and integrating quantitative and qualitative research. The advantage of this method is using multiple ways to explore a research problem. The researchers have used qualitative (interviews and observations) and quantitative (survey) research methods.

Population- Parents of differently able students and Teachers working for differently able students of secondary and higher secondary sections.

Sample- Interviewed 10 Teachers working for differently able students, 10 parents of differently abled students in Pune. Observed the teaching- learning process of differently abled students.

Survey conducted with structured questionnaire for 20 teachers working for differently able students.

### **Data Analysis and Interpretation:**

Interpretation of the qualitative research method (interviews and observations of teachers) is given below.

- The teachers opined that open and distance education can support differently able students.
- All the teachers agreed that visually impaired, auditory impaired, physically impaired, students with learning disabilities and slow learners will benefit from distance learning with guidance and support of the teachers.
- 80% teachers stated, to have same curriculum and syllabus for differently able students as per the normal students but the level of delivering the contents should be toned down.
- All the teachers agreed on the mode for delivering the content like, telephonic conversation (not for deaf), e-learning, virtual classes, online faculty chat, DVD's, MOOCs and mobile learning.
- 100% teachers agreed that open and distance education is beneficial for the students due to its flexibility, open access, provision of self-learning material, self-pace learning, and continuing education.

- 100% teachers viewed about the type of assessment and project to be given to differently able student such as online assignments/examinations, internet surfing for the project, field visit report and creative work with guidance.
- Teachers agreed on the effective utilization of technology in distance education for these students.
- 92% teachers agreed that patience and positive attitude should be developed towards use of technology, whereas remaining believed that traditional mode of teaching is sufficient for these students.
- Teachers opined that technological openness can effectively be utilized if they are trained to use these technological tools for active teaching learning process.
- As observed teachers using technology for delivering contents,

Interpretation of the qualitative research method (interviews of parents) is given below.

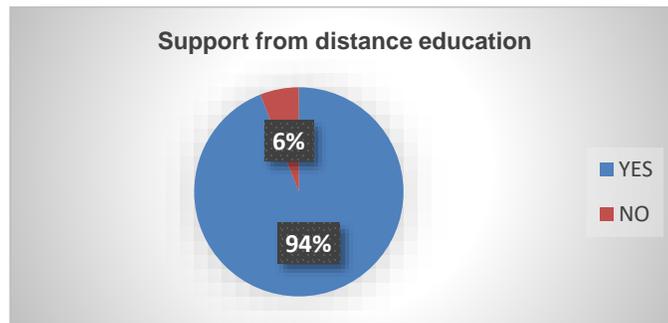
- All agreed that open and flexible learning can give opportunity to their children to continuing their education.
- Self-paced learning was chosen as most distinctive feature of ODE which will build self-confidence and self-esteem of differently able student.
- All Parents agreed that patience and positive attitude, should be developed towards use of technology.
- 84% of parents showed willingness to support their children through the use of technology, whereas others are comfortable with the methods used in traditional/special schools.
- 90% of parents positively expressed their views toward use of mobile learning as free applications are accessible and so it is cost effective.
- 40% of parents are using technological tools for supporting mathematics and language learning.
- All agreed that co-ordination between teachers and parents related to use of technology will help in overall development and growth of the student.
- Orientation and training for the use of technological tools should be provided by the school and teachers which will help the parents to support their children.

Interpretation of the qualitative research method (observations) is given below.

- As observed, teachers are using technology for their regular delivering classes, but rarely.

- Teachers realize the importance of technological tools for differently abled students, but because of lack of periodic induction or training, they are unable to use it.
- It is observed that students enjoy learning through use of technology like Talking Keyboard, Talking mobile, with their teachers and parents.
- Flexibility and self-paced learning is lacking in traditional mode of teaching for these children.

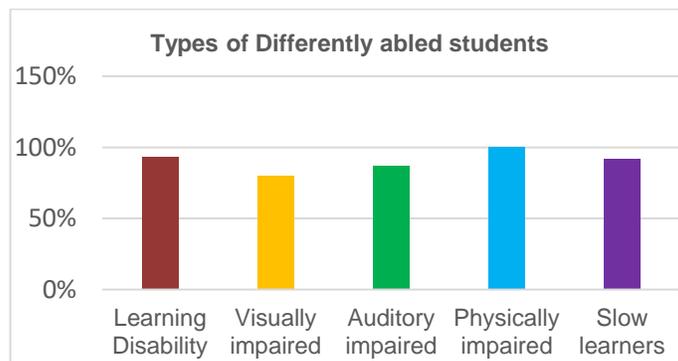
**Interpretation of the quantitative research method (survey) is given below.**



**Fig.3. Support from distance education**

The above pie chart interprets that 94% respondents agreed that support from distance education is beneficial for differently abled students.

The bar diagram represents the percentage of the types of differently abled students who can benefit from distance learning as follows: -



**Fig.4. Support from distance education**

**Table 1: - Percentage of Types of differently abled student**

Types of Differently abled students	%
Learning Disability	93%

Visually Impaired	80%
Auditory Impaired	87%
Physically Impaired	100%
Slow Learners	92%

The table shows, 100% respondents agreed that physically impaired students can benefit from distance education, whereas 80% to 93% respondent agreed that other types of differently abled students will need more support than the physically impaired.

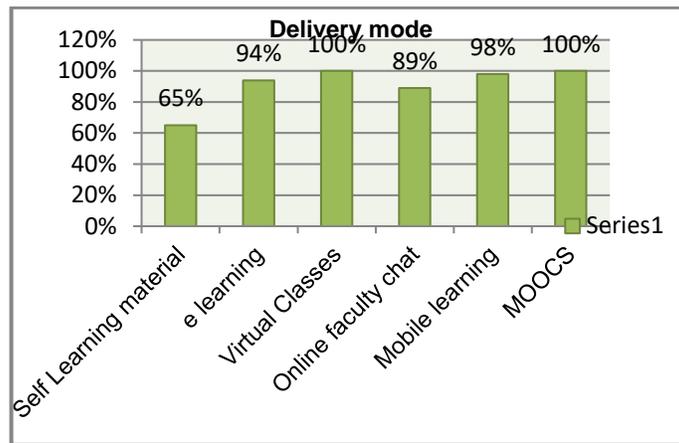


Fig.5. Delivery Mode

The above graph depicts the percentage of delivery mode beneficial for differently able students. The graph shows, 100% respondents agreed that MOOCs and Virtual classrooms are an effective delivery modes, followed by other delivery mediums.

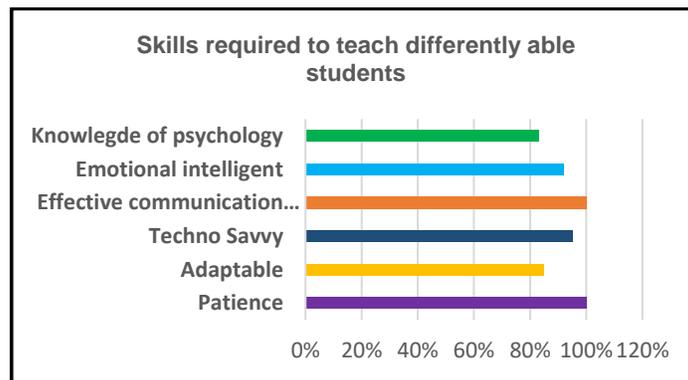


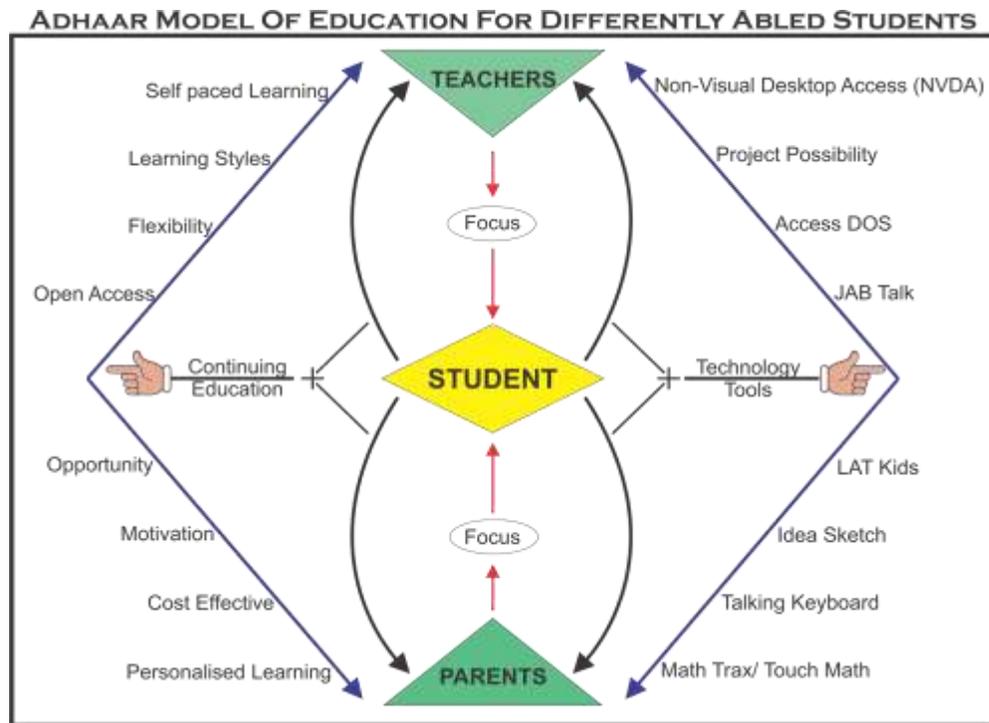
Fig.6. Skills required to Open and distance teachers

The horizontal bar graph represents the required skills for distance teachers. 100% respondent agreed that patience and effective communication skill are necessary to teach the

differently abled students. It is observed that 83% to 95% respondents opined that other skills are important and essential for distant teacher.

Proposed Model (Aadhar Model of Education for Differently Abled Students)

The Internet and the computers we use to access are full of educational possibilities that can help to speed up, complement or provide endless opportunities to expand our knowledge. Unfortunately, sometimes differently abled students may find these resources more difficult or sometimes impossible to access. Therefore teachers and parents play a vital role by supporting these students. The use of technology will initiate the learning process and ultimately build self-confidence in the learners. The opportunity given by open and distance institutions along with the efficient use of technology will facilitate continuing education of differently abled students. On basis the research conducted, we propose a model depicting the features and technological tools.



As given in model there are selected tools based on their free availability and user friendly features. Brief description of tools given below:

Non-visual Desktop Access (NVDA) - NVDA is an open source screen reader that allows those with visual impairment to enjoy the information and educational possibilities of the Web. Besides general Windows functionality, NVDA works with software such as Microsoft office applications, WordPad, Notepad, Internet Explorer, Google chrome, etc. It supports the basic functions of Outlook Express, Microsoft Word, Microsoft PowerPoint and Microsoft Excel.

Project Possibility- Project Possibility is a non-profit community service project that aims to create open source software that is designed for people who have disabilities including a variety of educational tools, word prediction, music in screen-reader friendly format and an accessible currency converter.

Access DOS- This Microsoft utility makes it easier for those with physical or hearing disabilities to use the keyboard and mouse by providing simple access keys and sound feedback to users.

JABTalk- JABtalk is a free speech communication application designed to help non-verbal children and adults communicate. Speech therapists commonly refer to JABtalk as an easy and effective augmentative and alternative communication (AAC) device. By combining personalized voice and images with an extremely simple user interface, JABtalk delivers a speech solution that is both fun to use and easy to learn. It has originally designed as a communication tool for children with special needs.

LAT Kids- The LAT group develops a range of software for children K-12 who have learning disabilities and makes it free to use for visitors on the Web. It can be a great learning tool for many who suffer from a variety of disabilities. LAT Kids is the nickname of the LifeShare Assistive Technology Project, a ministry of The LifeShare Foundation in Jackson, Mississippi. Its mission is to better the lives of children with disabilities through the use of technology. LAT Kids offers for download all of the software and resources it develops, free of charge, and in Mississippi currently offers one-on-one consulting with children, parents, teachers and therapists, also free of charge.

Idea Sketch- Idea Sketch is a concept-mapping app that allows you to capture ideas and organize them into diagrams such as mind maps, concept maps or flow charts. No drawing required, just enter your text and move the shapes around. A great feature of Idea Sketch is its ability to copy text from another app and import it into Idea Sketch to create an idea that can be viewed both as a diagram or outline. Students can copy and import text from various documents into Idea Sketch

to create an idea that can be displayed as a diagram or outline. Diagrams or outlines can be easily saved into Photos or shared via E-mail or Dropbox.

Talking Keyboard- If you can't see the keys on the keyboard well, this tool can help you out. It tells you exactly what keys have been pressed and you can set it up to respond to audio commands. It is affordable, powerful easy-speech generating device. Perfect for speech impaired individuals, post- operative patients, or as a health product solution for anyone who needs an affordable voice generation device that generates synthesized speech.

MathTrax / TouchMath- MathTrax is a graphing tool for middle school and high school students to graph equations do physics simulations or plot data files. MathTrax is a computer program that works like a graphing calculator. The program graphs mathematical equations, then describes them with sounds and words. The touch math system offers a range of free worksheets on their site that can help make math a more multi-sensory experience.

The TouchMath is a strategy for solving addition problems for students who have Individual Education Plans (IEP's). According to the National Center for Learning Disabilities (NCLB), students with special needs often have problems with memory and therefore find it difficult to remember math facts and keep a sequence of steps in order. These students are sometimes referred to as having dyscalculia. They require specialized instruction and alternate or modified content in order to be successful in the general education classroom.

## **CONCLUSION**

This paper presented that, open distance learning opens a wide scope for differently abled students. The research strives to analyze the imperative role of distance education, so that a positive attitude could be inculcated among teachers, parents and learners to optimize ODL usage and promote excellence in education, for differently abled students, ensuring inclusive quality education and skill development. Therefore ODE is a medium through which we can reach the unreached.

The syllabus and the content should be differently abled student centered. Various delivery modes should be used which can cater the need of differently abled students. Teachers need to develop the skills to understand, communicate, and adapt differently abled students. The open and distance institutes should provide more opportunities and E-resources for continuing their education and include in the main stream.

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